Gate 2 Submission: Supporting Technical Report

Annex 6: Efficiency of Expenditure

6th December 2021

from Southern Water

Contents

Executive Summary

This annex sets out the costs of progressing the three SROs from Gate 1 to Gate 2. As well as providing details of the costs incurred, it explains the approaches used to ensure that the costs have been efficiently incurred.

The costs until the 6th of December are a combination of actual (up until the 3rd of November) and accrued value of work done assessments (VOWD).

Southern Water is required to progress through the Gated process at an accelerated rate compared to the other companies also progressing through the process. This is currently scheduled to include submitting a request for a Direction under s35 of the Planning Act 2008 to consent the Selected Option through the Development Consent Order (DCO) process and then submitting an application for a DCO in 2023. It also requires SW to begin construction at the start of AMP8. Therefore, this requires more substantive early advisory technical and legal support on the different processes and regimes that the SROs will pass through. SW has structured SW's programme to front-load these elements accordingly.

In some areas, SW has been able to commence a select number of Gate 3 activities early. SW have chosen to do this as part of Southern Water meeting its obligation to use all best endeavours under the Section 20 agreement. These costs should be netted off SW's future Gate 3 allowance. SW has presented the costs associated with these activities separately.

This approach to early delivery of certain Gate 3 activities was discussed with RAPID on 7th of May 2021, 30th of June, and the 26th of July checkpoint meeting (see meeting minutes for details), and more recently at the October 21st Checkpoint and November 19th meetings.

Table 1 – Gate 2 and early Gate 3 costs (17/18 price base, £k)

	Final determination cost allowance	Gate 2 expenditure	Variance	Early Gate 3 costs
Total costs	12,108	12,748	640	5,913

In September, SW provided an Interim Update on Gate 2 expenditure incurred up to 27 September. This was £12.3m. As shown in the table above, SW's expenditure for the whole of Gate 2 (up to 6 December) is £12.7m.

There are two key drivers for increases in Gate 2 costs since the September Interim Update:

1) Future needs assessment. This is the analysis of future water demand that was agreed at the Interim Update.
2) The cost of producing Gate 2 a submission in addition to the Interim Update. This included:
    - Programme management and document drafting
    - Legal review of documentation
    - Assurance of documentation

Further detail on the activities completed between the Interim Update and the rescheduled Gate 2 submission are included in Appendix A.

There was also some partial offsetting adjustments as forecast costs were updated for actuals.

The above figures exclude all costs incurred on non-SRO projects. Where common costs (e.g., programme management) has been used to support both SRO and non-SRO projects, SW has apportioned the costs incurred to ensure that the above stated costs only reflect SROs. SW has set up dedicated cost centres for

the 'Water for Life – Hampshire' programme, and as such, is able to ensure that all business-as-usual costs have been excluded.

For Gate 1, SW incurred costs materially (c.20%) below the Ofwat allowance. For Gate 2 SW has spent more than the regulatory ex ante allowance, going c.5% over. The key reasons being:

1) The costs described above relating to progressing from the Interim Update to the December submission; and

2) The general challenge that the SROs SW are developing are technically complex, and, as SW moves through the accelerated Gated Process at pace, in order to enable construction to start at the earliest possible date the amount of technical and legal guidance, and also the risk analysis, significantly increases (at a rate greater than SROs that are not progressing first through the accelerated Gated process, and in effect pathfinders in the process, or in addition, delivering against the back drop of an all best endeavours obligation, which the Ofwat allowance has in part been based on).

   In particular, SW has undertaken two pilot trials. A pilot to provide proof of concept has been operating at Peel Common WTW since 2020. This trial is necessary to provide raw sample data to the engineering teams to support their process designs (including mass-balance), to demonstrate to regulators and customers the processes efficacy. The trial has included different configurations of the reverse osmosis process, followed by advanced oxidation and UV sterilisation.

   This is a necessary step to design a safe solution, particularly where the process train is novel to the UK water industry. SW would not expect the 'typical' SRO passing through the Gateway process to undertake such trials, and therefore, such costs are unlikely to have been included in the cost allowance.

   The trials have been designed and delivered using SW's established capital delivery processes, using competitively tendered frameworks within SW's supply chain. Globally sourced, specialist expertise have been brought in to enhance SW's existing capacity.

   In total, the pilot trials account for £0.7m of the Gate 2 expenditure (in 2017/18 prices), and £1.8m of the early Gate 3 expenditure (see section 1.3 for further details of Gate 3 forecasts).

Following SW's Gate 1 submission, Ofwat challenged aspects of SW's costs, including the lack of benchmarking that had been included in SW's submission.

In terms of project cost management, there are a number of benchmarking, knowledge-based elements and cost control mechanisms, which are used by SW.

However, there are extremely limited opportunities to benchmark steps in the project development process for highly idiosyncratic water infrastructure projects in their entirety, as a result there is not a wealth of relevant benchmark data available. Even if it was available, it would provide limited insight into the efficiency of SW's costs as there are many factors that drive legitimate differences between project requirements, including as set out above, the pathfinder nature of the accelerated Gated process, which is a new regulatory funding framework specific to the water industry. SW notes that the other water companies passing through the Gated process have also struggled to obtain meaningful benchmarks of Gateway costs.

Therefore, SW has focused on ensuring it has robust processes in place to ensure efficient costs. Details of SW's procurement and management approaches are provided in this annex. SW has also provided greater detail of the costs it has incurred, split out by activity, than the level of information that was include it its Gate 1 submission. This in order to provide a greater level of transparency and information to support the expenditure.

SW reached out to [redacted] requesting whether they were aware of any relevant benchmarks that could be used. SW did not receive any useable comparators in response. SW also

commissioned [redacted] to assess the scope for benchmarking at Gates 1 and 2. [redacted] found no representative benchmarking data for water projects at this early and specific project stage. SW will keep this under review for future gates and will continue to engage with its supply chain to understand whether any useful benchmarks become available in the future.

SW's costs on the SROs have been incurred in order to rapidly progress the development of multiple SROs in order to have a solution ready at the earliest possible date to meet SW's urgent need for water resources – this is essential to meet the requirements for SW's customers, the environment, and key stakeholders.

SW remind Ofwat and RAPID that the cost allowances capped development costs at 6% of total solutions costs. This was based on a limited number of comparisons, with at least one benchmark (the Thames Tideway Tunnel) having a much higher proportion of development costs at the comparable stage (10%). In its determinations, Ofwat stated that the '6% also assumes that costs for some components of complex solutions requiring development consent orders are more likely to happen beyond 2025'.[1] This is less likely to be the case for Southern Water than for other companies, due to the accelerated timetable that SW is working towards requiring it to make an application for development consent before 2025.

For these reasons, SW see the development cost allowance to be a challenging target and well below the only near comparable benchmark of Thames Tideway Tunnel (a wastewater development consent order project). SW consider that its outturn expenditure should therefore be allowed in full.

At Gate 1, the total amount SW spent was challenged by Ofwat; which focused in particular on SW's programme management and legal costs. In order to demonstrate to Ofwat and RAPID that SW's costs have been efficiently incurred, further detail has been provided on these two cost categories in relation to SW's Gate 2 and early Gate 3 spend.

SW also provide a forecast of total Gate 3 expenditure for discussion.

[1] Ofwat (2019) 'PR19 draft determinations: Strategic regional water resource solutions', page 13

1. Efficiency of Expenditure

1.1. Efficiency of expenditure to Gate 2

SW has used four approaches to deliver work in the timeliest and most cost-effective manner:

1. Delivery in-house using SW personnel and resources. These comprise c.13% of programme costs.
2. Appointment of suppliers from competitively sourced frameworks, managed by SW's professional procurement function. These comprise c.58% of programme costs.
3. Delivery via our strategic partner framework (SSP), managed by SW's strategic delivery partner [redacted] The SSP framework itself is a competitively sourced framework and is managed by SW's procurement function. These comprise c.22% of programme costs.
4. Where our in-house resources, frameworks or SSP cannot provide the skills/experience required, competitive tender via the supplier market, managed by SW's professional procurement function. These comprise c.6% of programme costs.

SW have used a combination of in-house and external expertise depending on which route represented the better value for money for the specific skills that were required for the Programme, which ensuring the correct qualified technical expertise are used to deliver the work. For sourcing external expertise, SW defined the scope of work required and assessed the procurement options against cost, competence, and timeliness criteria to determine which route to use for delivery. Key considerations for each of these criteria were:

- Cost – lump sum engagement or agreed fee ceiling where possible, most appropriate option assessed by degree complexity and risk of the scope of work;
- Competence – prior experience and expertise relevant to the scope requirements;
- Timeliness – ability to mobilise and complete the scope in the time required by the programme; and
- Compliance with the Procurement Regulations.

SW has continuously monitored budgets and reported on a monthly basis to SW's programme board.

SW has a clear decision tree process for deciding on the procurement route. An assessment is made as to whether a service with a defined output is to be delivered. If this is not the case, SW will seek a resource augmentation option as opposed to service/product procurement.

1.1.1. In-house delivery

SW's in-house resources are appointed through competitive recruiting processes, with overall remuneration packages regularly being tested against the market. SW has used internal resources in key strategic roles on the programme, as well as on areas where SW has the appropriate capabilities.

Examples of work delivered using internal resource:

- Overall project sponsorship direction
- Head of Project Delivery
- Head of Programme Design
- Head of Regulation and Regulatory engagement

Any business-as-usual cost elements (e.g., regulation) have been excluded from the SRO costs.

1.1.2. Appointment of suppliers from competitively sourced frameworks

SW has a suite of frameworks in place with agreed resource rates, and terms and conditions for the provision of services that have been sourced through competitively tendered procurement processes. SW's frameworks are defined by the nature of the services provided.

Many of these framework agreements were competitively tendered and let as recently as 2020 with multiple new providers and new rates. Both the older and new framework agreements have (i) competitive call-off arrangements for letting contracts under the frameworks, where appropriate (e.g., contract value over a framework set threshold, or strategic nature of required services, etc.) and (ii) clear ongoing benchmarking processes that Southern water may trigger periodically and the outcome of which flow through into the rates under the framework agreements.

Example of work delivered using this procurement route for Gate 2:

- CIT is a managed services provision from [redacted] who are contracted to the end of AMP7.

1.1.3. Strategic Solution Partner framework (SSP)

SW have procured supporting services via an engineering and technical services Strategic Solutions Partner (SSP) framework. The framework is contracted with [redacted] with strategic sub-consultants [redacted] works alongside SW's engineering team to help provide valuable expertise in outline design and scope requirements for projects. The SSP provides resources with an agreed rate card approach, standardised across the SSP supply chain. This enables SW to access global expertise through [redacted] and other associated suppliers.

In structuring the SSP framework, SW sought to drive maximum value for money. This is demonstrated by the following:

- The SSP Framework Contract was competitively tendered via OJEU in 2014 – i.e., it underwent a robust competitive process.
- In preparation for AMP7, the SSP contract was renegotiated in order to align to the new requirements for AMP7, including the Water for Life Hampshire programme. The renegotiation covered all aspects of the relationship including ensuring value for money (VFM), the key aspects which drive VFM including:
    - SSP Framework base rates were benchmarked using standard grade levels 6-12 (Clerical to Director) and by discipline, in comparison to equivalent rates through SW's alternative frameworks, and found to be an average of 15% lower.
    - An incentive mechanism to drive innovation and reduce total outturn costs through gainshare.
    - A supplier balanced scorecard with KPIs set up to drive cost reduction (demand challenge) ethos, aligned to the incentive mechanism.
    - A number of contractually driven efficiency levers in particular ongoing benchmark clauses, index linked inflation, refined expenses policy, and strategy to access SSP's offshore/low-cost country resources with no impact to quality.
- In addition, SW recently secured contractual commitment from the SSP to ongoing market competitiveness of rates throughout AMP7 through benchmark clauses that are part of the recently renegotiated Contract.

Examples of work delivered using this procurement route for Gate 2:

- Programme Management Support [redacted]
- Engineering support [redacted]

1.1.4. Studies and investigations framework (S&I)

The Studies & investigations Framework has been competitively tendered and was awarded in 2020.

The term of each Framework Contract is for an initial 4-year period with the option to extend the period by a further 4 years. Each Framework Contract specifies a template Work Order and a procedure for awarding projects within those lots.

The Work Order comprises the Form of Agreement incorporating the terms and conditions of the NEC4, Professional Service Contract ("PSC"), as further amended by the additional conditions set out in the template Work Order. The Work Order is to be signed under hand (not as a deed).

The Framework Contract is zero value and so Southern Water has no obligation to award a specific value or quantity of work to the Consultants.

All Contracts are an option A lump Sum. Expenses & Equipment will be included in the commercial option A total

- Where the Value <£100k the procurement route can be a direct Award under framework, although SW is under no obligation to Direct Award.
- Where the Value >£100k the procurement route is a mini competition between of all suppliers in the specific Lot in the framework contract.

In the lead up to Gate 2, activities have been under £100 and therefore

Examples of work delivered using this procurement route for Gate 2:

- Gate 2 Natural capital assessment (Ricardo)
- Gate 2 Environmental appraisal (RHDHV)
- Natural capital assessment (Ricardo)

1.1.5. Competitive tender via the supplier market

SW has an expert procurement function that is well experienced in effectively sourcing good value external support. The vast majority of SW's Procurement Team is either CIPS (Chartered Institute of Procurement and Supply) qualified or studying towards qualification.

Examples of work delivered using this procurement route for Gate 2:

- [redacted]egal services was selected through a competitive procurement process based on a defined scope that required specific experience advising on consenting and delivery of nationally significant infrastructure projects. RFPs were sent out to five organisations that SW had identified through extensive legal market research, infrastructure projects literature and pre-RFP expression of interests as capable of performing the services. This was considered to be a reasonable number to conduct an effective and efficient competitive procedure. This included all such identified providers of legal services already engaged in the various stages of other water companies potential DPC projects, but who were not otherwise excluded due to potential conflicts and/or resource constraints.
- [redacted] was appointed from SW's existing Business and Management Consultancy Framework Agreements, which framework agreements had only recently (2019) been re-procured following a

competitive tendering process involving over 60 potential suppliers to provide support for the development of SW's DPC assessments, and the procurement model.

- [redacted] – was appointed through a competitive process, to provide third line assurance support across the SROs.

1.1.6. Cost allocation

Costs relating to SROs

In order to maximise efficiency, SW has managed the investment needs in SW's Western Area as an integrated programme. We have assessed each cost item allocated to the Western Area Programme to determine whether there are non-SRO related costs.

The below table summarises the costs that SW have incurred as part of the broader Western Area Programme and have ensured are explicitly excluded from SW's Gateway cost reporting.

Table 2 – cost allocation summary, outturn prices

Cost item	Costs excluded from Gateway reporting, £k
Non-SRO PMO	288
Non-SRO consultancy costs	54
Interim measures	150
Bulk supply negotiation	24
SRO/WRMP interface legal support	31
IT costs (software purchase)	256
Thames-Southern SRO input	87
Total	**891**

Cost items have been individually identified for exclusion. The only exception is for PMO costs, where an allocation approach was used. This has been required, as the PMO function provides oversight across the Western Area Programme. For the PMO costs, SW analysed timesheets for 21 programme team members. SW found that on average 16.7% of time was spent on non-SROs. Therefore, SW made an equivalent adjustment to the PMO costs, removing 16.7% of the PMO costs from the Gateway cost reporting.

Solution type

The table below sets out how the individual SROs were allocated to solution type for cost reporting purposes.

Table 3 – Individual SROs to solution type

Solution type	SRO / Option
Desalination	A.1, A.2, and D1
Water recycling	B.2, B3, B.4, and B.5
Havant Thicket	D.2

Options B.1 was not continued past Gate 1 following confirmation in the Gate 1 Final Determination that this option would not be funded. Work was stopped on Option D.1 and Option B.3 prior to the Options Appraisal Process, as it was considered that there are too many uncertainties and risks with these options for them to be genuine alternatives to the Base Case in the context of the urgent need that SWS must meet.

Gate 2 and early Gate 3

In identifying which costs incurred relate to Gate 2 or Gate 3 activities, SW has used the following approach:

- For each category of spend, SW has assessed the activities undertaken and whether they relate to Gate 2 or Gate 3 activities. For most spend areas, there is a clear date (ahead of the Interim Update) where the support for Gate 2 work was completed, and the resource was re-deployed onto Gate 3 activities. For these areas, costs have been captured in line with the completion date. These have been determined through a detailed analysis of the overall work schedule.
- For a limited number of cost items, SW has had to apportion the costs between the Gates using selected cost drivers. These are:
    - PMO – these costs have been allocated in line with the direct expenditure across the SROs (51% Gate 2, and 49% Gate 3). An additional adjustment has been made for costs relating to the Future Needs Assessment, which solely relate to Gate 2 (making the final allocation 59% Gate 2, and 41% Gate 3).
    - Programme management – these costs have been allocated in line with the direct expenditure across the SROs (51% Gate 2, and 49% Gate 3). An additional adjustment has been made for costs relating to the management and drafting support associated with the Gate 2 submission – these costs solely relate to Gate 2 making the final allocation 68% Gate 2, and 32% Gate 3).

1.1.7. Inflation assumptions

SW's cost allowance was set in 2017/18 prices (CPIH). In order to compare SW's outturn costs against the allowance, SW has had to deflate SW's outturn costs by CPIH. However, full CPIH data up to the point of submission is not yet available.

Therefore, SW has taken two approaches to estimating the relevant CPIH deflator:

1) SW has rolled forward CPIH trend over the last year for the remaining two months of the year. SW has then taken an average of the CPIH indices September 2020 to November 2021. This gives a deflation factor of 6.16% to convert prices to the 2017/18 base.
2) SW has taken a midpoint of the period where costs have been incurred for this Gate (April 2021). This gives a deflation factor of 5.93% to convert prices to the 2017/18 base.

Both approaches have their strengths and weaknesses. As such, SW has taken a midpoint of 6.0% in order to deflate SW's costs. SW present SW's costs both in outturn and in real prices – as such, if Ofwat or RAPID wish to make a different inflation assumption, it should be straightforward to adjust the assumption used if required.

1.1.8. Benchmarking

In terms of project cost management, there are a number of benchmarking, knowledge-based elements and cost control mechanisms, which are used by SW. These can be summarised as follows:

1) A framework process, built on competitive tendering, benchmarking against business knowledge assessment of market and previous costs. There are accountable framework contract owners who will oversee performance and will review value for money as part of the cycle for each framework agreement.
2) An approval and sign-off process to the point of commitment of expenditure, controlled by defined delegations of authority. The levels are set by value and challenge is applied at each level of

seniority before approval. This authority runs from project manager to executive management and again is based on a knowledge-based assessment and target expectations.

3) A full tender process which would include the full suite of competitive benchmarking, market engagement and knowledge-based assessment.

Cost forecasting and performance in SW is monitored and measured as part of a formal monthly review and reporting process for costs, schedule and risks. Projects cost expenditure, accrual and forecasting is subject to review and challenge against budgets and previous forecasts with challenge applied to change or variation. Monitoring and measurement of performance will also occur at the point of expenditure by project managers and other responsible cost leads who will either be present at the point of delivery or will review and assess the activities and outputs of delivery. This then feeds into the cycle of review and reporting.

There is extremely limited opportunity to benchmark steps in the project development process for highly idiosyncratic water infrastructure projects in their entirety, as a result there is not a wealth of relevant benchmark data available. SW note that the other water companies passing through the Gated process have also struggled to obtain meaningful benchmarks of Gateway costs.

SW engaged with [redacted] requesting whether they were aware of any relevant benchmarks that could be used. SW did not receive any useable comparators in response.

SW commissioned [redacted] to assess the scope for benchmarking at Gates 1 and 2. [redacted] reviewed multiple different options for benchmarking the cost of developing the Water for Life project from RAPID Gate 1 to Gate 2. This included searching [redacted] own database, which is the world's largest academic database on project cost and schedule performance, data from the Government Major Projects Portfolio (GMPP), a complete dataset of Irish roads projects, and a complete dataset of the last 5 years of public procurement contracts.

[redacted] found no representative benchmarking data for water projects at this early and specific project stage. The most comparable data identified was from seven major roads projects in Ireland. This limited benchmark showed that the current cost estimate for developing the Gate 2 submission for the Water for Life project is reasonable under the assumption that it involves a somewhat more extensive preliminary investigations than the Irish roads in the benchmark. See the [redacted] report for further details.[2] However, this benchmark is not comparing a closely related project. As such, it provides limited insights.

We have also not found any suitable comparator data in the public domain for projects that are in the sector, or in the same jurisdiction with the same consenting and regulatory requirements. This involved looking to other regulated sectors such as energy development and airport DCO projects with complexity and scale.

Following these attempts to source relevant benchmarking, we have reviewed the recent standard Gate 1 publications and draft determinations and can see that these difficulties have also been experienced by the other organisations in those processes. SW will keep the scope for benchmarking under review for future gates and will continue to reach out to SW's supply chain to determine whether any useful benchmarks become available in the future.

[2] Oxford Global Projects (2021) 'Water for Life RAPID stage 1 to stage 2 cost benchmarking'

1.2. Total Gate 2 expenditure

1.2.1. Previously agreed format

The below tables set out the expenditure incurred in progressing the SROs. This has been split by direct costs for each SRO, and the common activities that are subsequently allocated. This uses the format that was presented, discussed, and agreed with RAPID on 7th of May 2021. Further descriptions of key cost areas are provided below each table.

Table 4 – Gate 2 and early Gate 3 costs – Desalination, outturn prices

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
Fawley to Testwood pipeline design development	Constructability review undertaken by SW Delivery Partner to take the pipeline corridors to the next level of design development, including schedule development with assumptions and risks for the Gate 2 CAPEX estimating	91	0	91	86
Design Development	Activities for G2 largely centred around the development of the concept design to inform the CAPEX estimate and environmental assessments. This data then informed the Options Appraisal Process. Design detail was enhanced through route refinement to main connection points in overall design. Designs were developed using a multi-disciplinary engineering team. Some development costs relate to the preparatory works to launch engineering surveys and early phase development, such as land desk studies, to feed into the non-statutory consultations.	844	646	1,490	1,405
	- *Process Design*			*733*	*692*
	- *Mechanical Design*			*323*	*305*
	- *Civil Design*			*248*	*234*
	- *Electrical*			*80*	*75*
	- *ICA*			*80*	*75*
	- *Design management*			*26*	*25*
Planning and Environmental works	The principle focus for the planning activities prior to G2 include site selection, initial pipeline route selection, the Consenting Evaluation, engagement with consultees, preparing to submit a s35 Direction for the Base Case and early activities associated with the DCO pre-application process. As part of the ongoing Gate 2 work and preparing for the planning process, environmental assessments have been carried out to inform the Gate 2	150	22	172	163

	deliverables (outline HRA, SEA, WFD etc), and also the site selection and Consenting Evaluation and Options Appraisal Process.				
Site surveys	The principal cost associated with the site surveys was in the water quality sampling and testing space to inform both the design development and the drinking water safety plan. Due to the site selection process this covered an extension area with weekly samples being undertaken in twenty-one locations. Topographical and GPR surveys were undertaken as well as ground truthing surveys on the four route corridors. Methodologies and protocols were developed for ecological and environment surveys along with undertaking phase one habit surveys via flyovers. Initial on site ecological and environmental surveys were undertaken for surveys with applicable open survey windows	1,747	0	1,747	1,648
	- *Sampling analysis*			*624*	*589*
	- *Environmental, Ecological, Terrestrial and Marine Surveys*			*340*	*321*
	- *Aquatic, Terrestrial, and Marine ecology surveys*			*173*	*163*
	- *Boat work*			*98*	*92*
	- *Preparation for Environmental Impact Assessment with associated surveys*			*91*	*86*
	- *Other cost categories*			*421*	*397*
Non-statutory consultation	Specialist consultation support on drafting consultation materials and developing a consultation strategy. Development of animation and film by professional company. Development and hosting of Virtual Engage platform. Professional photography. Printing of consultation brochure. Adverts in local newspapers.	92	0	92	87
Project management	Project Management to lead and manage the projects.	99	0	99	93
Sub-total		3,022	668	3,690	3,481

Design development

These costs relate to SW's in-house engineering team supported by the SSP and its supply chain. This has included marine engineering support and tunnelling support.

The output has been a detailed design report including process flow diagrams, provision layouts, process trains, mass balance analysis, and supporting engineering assessments.

This is comprised of the following cost items:

- Process Design – The majority of the work at the start of and during Gate two was outlining the process, which develops at a rate relative to the data captured. The output of works is a mass flow calculation and process flow. The related costs are a single output of resource time.
- Mechanical Design – Mechanical sizing based on flow specific to option and sizing of desalination plant process units.
- Civil Design – General plan / sections produced from outline mechanical sizing.
- Electrical – Basic electrical designs produced against outline Mechanical design.
- ICA – Basic Instrument, Control and Automation design produced against overall design.
- Design management – coordination and oversight of how the design workstream is delivering to plan.

Site surveys

To inform SW's desalination plans, SW has undertaken a range of sampling and monitoring activities. The larger components are:

- Sampling analysis – For a large number of samples, SW has had to use a SW-based laboratory, as there are no UK laboratories with the required accreditation. For full details of the sampling activity, please see Concept Design Report section 2.1.1 in the Interim Update submitted 27 September 2021. Sampling points includes 20 coordinates across five different clusters. The sampling programme ran from Jan-Oct 2020. The cost is for the iterative development of testing techniques and parameters, testing and data development.
- Environmental, Ecological, Terrestrial and Marine Surveys – This includes both hydrodynamic modelling and dispersion plume modelling, topographical surveys, bathymetric surveys, and ground truthing.
- Aquatic, Terrestrial, and Marine ecology surveys.
- Boat work – SW commissioned a commercial diving company to go into the Solent to collect water samples.
- Preparation for Environmental Impact Assessment with associated surveys – this included traffic counts, AQ, noise, landscape and visual.
- Other cost categories – this includes Land and Marine surveys, and the pipeline corridors.

Table 5 – Gate 2 and early Gate 3 costs – Water recycling, outturn prices

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
Engineering Studies and Surveys	UV/AOP Pilot trial - Peel Common WTW. Proving the concept and application of the process design. Collecting data to evidence the process efficacy of water design. Being undertaken in Gate 2 period to enable SW to collect sufficient data to support DWI approval of water recycling in the UK.	766	643	1,409	1,329
	- *Hiring the Pilot trial equipment and facilities*			*259*	*244*

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
	- *Trialling the design concept, operating and maintaining it*			*285*	*269*
	- *Sampling, Sampling Prep and Analysis*			*429*	*405*
	- *University of Brighton Sample Prep and Testing*			*413*	*390*
	- *Pilot Consumables/ Sundries*			*21*	*20*
Ceramic membrane Pilot trial - Otterbourne WSW	The ceramic membrane pilot trial is designed to inform the design and delivery of the pre-disinfection plant at Otterbourne to receive the water transferred from the source under this SRO. Given both the complexity of design and Southern Water's commitment to DWI to deliver Otterbourne pre-disinfection works by 2026, the pilot trial for Otterbourne was brought forward into the G2 period. Given its relevance to both Havant Thicket Raw Water and the water recycling SROs the costs associated to the Otterbourne pilot trial have been split between these two SROs. Two pilot plants will be run to support a competitive tender for the permanent works design. The costs represent the following: civil and process outline design, pre-construction information, supplier procurement until contract award, hiring of pilot plant	0	646	646	609
	- *PWNT membrane*			*310*	*329*
	- *Nanostone membrane*			*336*	*356*
Engineering Studies and Surveys	Design Consultancy undertaken by Internationally recognised specialist in water recycling design. Input includes engineering, construction best practice, analysis of the sampling data. Being undertaken in Gate 2 period to enable SW to collect sufficient data to support DWI approval of water recycling in the UK.	838	817	1,655	1,561
	- *Planning, scoping, and initiation*			*200*	*189*
	- *Specialised laboratory testing*			*330*	*311*
	- *Project Management, regulatory support and presentations*			*114*	*108*
	- *Data collection and processing*			*418*	*394*
	- *Process design support*			*418*	*394*
	- *Design management*			*175*	*165*
Design Development	Activities for G2 largely centre around the development of concept design to inform the CAPEX estimate and environmental assessments. This data then informed the Options Appraisal Process. Design detail was enhanced through route refinement to main connection points in overall design.	643	508	1,151	1,086

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
	Designs were developed using a multi- discipline engineering team Some development costs relate to the preparatory works to launch engineering surveys and early phase development, such as land desk studies, to feed into the non-statutory consultations.				
	- *Process Design*			*498*	*470*
	- *Mechanical Design*			*199*	*188*
	- *Civil Design*			*199*	*188*
	- *Electrical*			*50*	*47*
	- *ICA*			*50*	*47*
	- *Design management*			*155*	*146*
Planning and Environmental works	The principle focus for the planning activities prior to G2 include site selection, initial pipeline route selection, the Consenting Evaluation, engagement with consultees, and early activities associated with the DCO pre-application process. As part of the ongoing Gate 2 work and preparing for the planning process, environmental assessments have been carried out to inform the Gate 2 deliverables (outline HRA, SEA, WFD etc), and also the site selection and Consenting Evaluation and Options Appraisal Process.	125	36	161	152
Site surveys	Environmental, Ecological, Terrestrial only at this stage	38	0	38	35
Project management	Project Management to lead and manage the projects.	98	0	98	92
Sub-total		2,508	2,649	5,157	4,865

UV/AOP Pilot trial - Peel Common WTW

A small-scale Water Recycling treatment plant has been designed, constructed and is being operated at Peel Common WTW. This plant mimics the outline design treatment train and is critical to the process design, water safety planning, procurement and to provide the operational knowledge required to move forward with this SRO. This pilot plant is also set out to align with Southern Waters Asset Strategy for Water Recycling.

This is comprised of the following cost items:

- Design, Build and Operation of Pilot Plant – The pilot plant Ultra Filtration/ Reverse Osmosis technology and UV AOP process is currently hired on a monthly basis. This includes hire of the site requirements such as offices/ laboratory etc.
- Sampling, Sampling Prep and Analysis – There is daily sampling carried out on the pilot plant which informs SW's consultants and design team, these are sent to SW's framework laboratories. Approximately every quarter, a larger sampling event occurs where a team goes out into the catchment to collect a wide array of samples, so SW can baseline this against the pilot data to look to profile against plant performance.
- [redacted] Sample Prep and Testing – Using academic experts to quality assure the pilot suppliers performance testing, prepare exotic samples for transportation to Eurofin's USA, bench scale pilot plant.
- Pilot Consumables/ Sundries – Pilot plant chemical, office supplies, cleaning, etc.

Ceramic membrane Pilot trial - Otterbourne WSW

The expenditure has been allocated 50:50 between water recycling and Havant Thicket.

The Otterbourne works is currently being re-configured to have a new combined (surface water and ground water) disinfection stream comprising UV and chlorination by 30th June 2022. The implementation of UV will enable the de-commissioning of the Memcor MF membrane plant along with its expenditure of £2m every seven years in membrane replacement. The DWI has given Southern Water a target date of the 31st December 2026 to construct and commission of what is termed the long-term pre-disinfection treatment at Otterbourne – i.e., replacement of the old clarification and rapid gravity filtration plant installed in three phases from 1939 – 1958.

This high-quality raw water is outside the proven treatment ranges of conventional clarification processes such as DAF, FBC and Actiflo and more in the range of MF/UF membranes (pressurised and immersed). Based on the known problems of the Otterbourne Memcor MF groundwater plant (membrane pinning and replacement every 7 years) in conjunction with the projected lack of space at Otterbourne after installation of the new disinfection plant it is essential to evaluate whether ceramic membranes can provide an effective and compact long-term front-end treatment solution for Otterbourne.

The pilot trial includes:

- Water Sampling Data sets to validate the potential use of Ceramic Membranes at Otterbourne.
- Water Sampling Data sets to allow SW to consider using this technology across other SW surface water works as part of SW's longer-term asset strategy.
- Allow engagement by the operational teams to see the technology in full flight during the process. Essentially an early training and familiarisation exercise. Always a good message to the teams.
- Education – School Children and Engineering Graduates can visit the pilot scheme and learn about the new technologies in the water industry. All part of SW's wider comms piece that SW undertake within the local community.
- Stakeholder Liaisons – As Ceramic Membranes are not wider used in the UK; the pilot will be used to inform SW's regulators of the technology in-situ.

- OPEX Predictions – data can be drawn out of the pilot plants to allow an upscaling the power usage and the like to inform the design at full scale. Basic OPEX costs such as the amount and type of chemicals required in operation can also be predicted.

The trials relate to two membrane types: PWNT and Nanostone.

Water recycling design consultancy

SW has commissioned internationally recognised leaders in the field of water recycling design to provide the following support:

- Design the process train.
- Model abstraction requirements.
- Analyse sampling data.
- Inform design and construction commissioning processes in terms of scheduling.
- Support with regulatory engagement.

This is comprised of the following cost items:

- Formalising the pilot plant work-plan, scoping work items to align with RAPID lifecycle, sourcing specialist laboratories, outlining potential suppliers given worldwide knowledge of the industry. Supported through procurement process and pre-construction to ensure smooth onsite works. Produced work packages, risk assessments.
- Specialised laboratory testing in the USA. As the determinants required for testing are fairly unique and there are not the necessary accredited methods in the UK, SW's consultant arranged for the testing in the early phases of Gate 2.
- Project Management, regulatory support and presentations.
- Production of advanced database for data collection, software production, downloading and interrogation of laboratory results, quality control of results and input into presentation platform. These presentations form part of SW's level 4 CDR detail.
- Process design support, providing preliminary drawings, creating technical reports and developing CDR.
- Design management – coordination and oversight of how the design workstream is delivering to plan.

Concept Design Development (ETS)

Specialist Process engineering team using catchment sampling data (river) to develop the process design. Multi discipline Engineering team developing the MECH, elect, civil, structural aspects of the concept design.

This is comprised of the following cost items:

- Process Design – The majority of the work at the start of and during Gate two was outlining the process, which develops at a relative projector to the data captured.

- Mechanical Design – Mechanical sizing based on flow specific to option and sizing of recycling plant process units.
- Civil Design – General plan/ sections produced from outline mechanical sizing.
- Electrical – Basic electrical designs produced against outline Mechanical design.
- ICA – Basic Instrument, Control and Automation design produced against overall design.
- Design management – coordination and oversight of how the design workstream is delivering to plan and aligns to the broader programme.

Table 6 – Gate 2 and early Gate 3 costs – Havant Thicket raw water outturn prices

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
Ceramic membrane pilot trial – Otterbourne WSW	The ceramic membrane pilot trial is designed to inform the design and delivery of the pre-disinfection plant at Otterbourne to receive the water transferred from the source under this SRO. Given both the complexity of design and Southern Water's commitment to DWI to deliver Otterbourne pre-disinfection works by 2026, the pilot trial for Otterbourne was brought forward into the G2 period. Given its relevance to both Havant Thicket Raw Water and the water recycling SRO the costs associated to the Otterbourne pilot trial have been split between these two SROs. Two pilot plants will be run to support a competitive tender for the permanent works design. The costs represent the following: civil and process outline design, pre-construction information, supplier procurement until contract award, hiring of pilot plant	0	646	646	609
	- *PWNT membrane*			*310*	*329*
	- *Nanostone membrane*			*336*	*356*
Portsmouth Water costs	Following the agreed governance model between Southern Water and Portsmouth Water to G2 delivery, Portsmouth Water, and their downstream suppliers, have engaged and provided support throughout the G2 period. The MoU (signed early 2021) Southern Water covers 100% of Portsmouth Water's costs for the development of Havant Thicket alternatives. Key interface activities include providing lessons learned to inform the environmental and corridor refinement, sharing design data on the Havant Thicket reservoir schemes to inform reservoir connections and drinking water safety plans and supporting regulator progress meetings. Portsmouth Water have also informed key internal delivery documents such as: risk registers, resource requirements and procurement schedules.	40	8	48	45
Design Development	Activities for G2 largely centre around the development of concept design to inform the CAPEX estimate and environmental assessments. This data then informed the MCDA. Design detail was enhanced through route refinement and outlining proposed connections at the Havant Thicket reservoir with Portsmouth Water. Designs were developed using a multi- discipline engineering team.	115	448	563	531

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
	G3 design development costs relate to the preparatory works to launch engineering surveys and early phase development, such as land desk studies, to feed into the non-statutory consultations.				
	- *Design management*			*141*	*133*
	- *Civil*			*281*	*265*
	- *Mechanical and electrical*			*112*	*106*
	- *Process*			*29*	*27*
Planning and Environmental works	The principle focus for the planning activities prior to G2 include site selection, initial pipeline route selection, the Consenting Evaluation, engagement with consultees, and early activities associated with the DCO pre-application process. As part of the ongoing Gate 2 work and preparing for the planning process, environmental assessments have been carried out to inform the Gate 2 deliverables (outline HRA, SEA, WFD etc), and also the site selection and Consenting Evaluation and Options Appraisal Process.	75	22	97	92
Site surveys	Environmental, Ecological, Terrestrial and Marine Surveys.	0	88	88	83
Project management	Project Management costs include dedicated full-time resource for budget management, resourcing, procurement, project planning, risk management, schedule management and project governance. A large part of the project management resource has been developing and supporting the project interface with Portsmouth Water including, but not limited to agreeing and implementing the governance and strategy, preparing for joint delivery and reviewing alignment opportunities.	119	0	119	113
Sub-total		350	1,212	1,561	1,473

Ceramic membrane Pilot trial - Otterbourne WSW

The expenditure has been allocated 50:50 between water recycling and Havant Thicket.

The Otterbourne works is currently being re-configured to have a new combined (surface water and ground water) disinfection stream comprising UV and chlorination by 30th June 2022. The implementation of UV will enable the de-commissioning of the Memcor MF membrane plant along with its expenditure of £2m every seven years in membrane replacement. The DWI have given Southern Water a target date of the 31st December 2026 to construct and commission of what is termed the long-term pre-disinfection treatment at Otterbourne – i.e., replacement of the old clarification and rapid gravity filtration plant installed in three phases from 1939 – 1958.

This high-quality raw water is outside the proven treatment ranges of conventional clarification processes such as DAF, FBC and Actiflo and more in the range of MF/UF membranes (pressurised and immersed). Based on the known problems of the Otterbourne Memcor MF groundwater plant (membrane pinning and replacement every 7 years) in conjunction with the projected lack of space at Otterbourne after installation of the new disinfection plant it is essential to evaluate whether ceramic membranes can provide an effective and compact long-term front-end treatment solution for Otterbourne.

The pilot trial includes:

- Water Sampling Data sets to validate the potential use of Ceramic Membranes at Otterbourne.
- Water Sampling Data sets to allow SW to consider using this technology across other SW surface water works as part of SW's longer-term asset strategy.
- Allow engagement by the operational teams to see the technology in full flight during the process. Essentially an early training and familiarisation exercise. Always a good message to the teams.
- Education – School Children and Engineering Graduates can visit the pilot scheme and learn about the new technologies in the water industry. All part of SW's wider comms piece that SW undertake within the local community.
- Stakeholder Liaisons – As Ceramic Membranes are not wider used in the UK; the pilot will be used to inform SW's regulators of the technology in-situ.
- OPEX Predictions - data can be drawn out of the pilot plants to allow an upscaling the power usage and the like to inform the design at full scale. Basic OPEX costs such as the amount and type of chemicals required in operation can also be predicted.

Concept Design Development (ETS)

This is comprised of the following components:

- Design management - coordination and oversight of how the design workstream is delivering to plan and aligns to the broader programme.
- Civil – engineering input into the route corridor selection, including the identification and calibration of the technical constraints to inform the route selection tool.
- Mechanical and electrical - pumping stations design, and break pressure tank design.
- Process - water quality investigatory works at the Havant Thicket reservoir.

Table 7 – Gate 2 and early Gate 3 costs – Common activities, outturn prices

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
Project Management Office (PM0)	The PMO provides both strategic and tactical oversight of all workstreams and deliverables, whether internal or external. The PMO provides project controls, including tracking delivery of outputs, progress to schedules, costs tracking, resource oversight, monitors the interfaces between the workstreams and with the wider business, provides project management services to projects, as required.	837	574	1,411	1,331
	- *PMO management*			*387*	*365*
	- *PMO Transformation*			*372*	*351*
	- *Risk management*			*168*	*158*
	- *Cost control*			*154*	*145*
	- *Assurance*			*269*	*254*
	- *(Schedule) Planning*			*228*	*215*
	- *Authoring support*			*145*	*137*
	- *Costs allocated to non-SROs*			*-312*	*-295*
Programme management	Southern Water senior delivery management of both projects and programme	845	407	1,252	1,181
	- *Programme director*			*278*	*262*
	- *Programme management*			*269*	*254*
	- *Programme sponsor support until interim update*			*263*	*248*
	- *Programme sponsor support post interim update*			*107*	*101*
	- *Submission development*			*79*	*74*
	- *Authoring support*			*256*	*242*
Legal advice	Legal and strategic advice on consenting, regulatory and procurement matters including advising on: planning and consenting strategy including the DCO and TCPA regimes; scheme and site development; stakeholder engagement and public consultation; the Consenting Evaluation, MCDA and Options Appraisal Process, the RAPID interface and Gated process and related submissions; contracting and procurement strategy and DPC; and interface between the SRO and water resource management planning (statutory WRMPs and regional planning).	918	210	1,128	1,064
	- *Consenting*			*314*	*296*

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
	- *Regulatory support*			*440*	*415*
	- *Procurement support*			*105*	*99*
	- *General (cross cutting)*			*157*	*148*
	- Legal secondee to WfLH programme (SRO consenting and delivery)			*113*	*107*
Planning and consenting	Specialist planning resource to advise on the consenting process, including the DCO regime	506	80	586	553
Environmental / EIA Studies	Natural Capital assessment	177	19	196	185
Commercial Analysis	Cost estimation and embedded carbon calculation	258	0	258	244
Commercial Analysis	Southern Water resources to provide procurement and commercial management of External Supply Chain required for Gate 2.	671	257	928	875
	- *Market engagement*			*230*	*217*
	- *Procurement of contracts*			*380*	*358*
	- *Reverse Osmosis strategy*			*38*	*36*
	- *Sourcing Strategy and PQQ*			*110*	*104*
	- *mini competition for DPC consultancy support*			*170*	*160*
Commercial Analysis	Value for money analysis, Commercial model development, Late Tender model development, Market Engagement, Development of Implementation Plan. Development SOC, Development of Procurement Plan, Development of Gate 2 submission, Senior management and board sessions	876	127	1,004	947
	- *Value for money analysis*			*161*	*152*
	- *Articulate the tender model, Develop high level commercial model for DPC delivery, Outline an implementation plan*			*361*	*341*
	- *Informal market engagement exercise*			*120*	*114*
	- *Drafting the Gate 2 submission*			*241*	*227*
	- *Other DPC support*			*120*	*114*
Commercial Analysis	Option Appraisal Framework consistent with Green book and consenting requirements	627	0	627	591
	- *Scope of best value appraisal and development of MCDA framework*			*198*	*186*

Activity	Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)	Total (£k, 2017/18 prices)
	- *MCDA results, engagement, write up, and revalidation*			*258*	*244*
	- *Further economic appraisal selection support*			*171*	*161*
National Audit Unit (NAU)	Work undertaken by Environment Agency and Natural England	448	41	489	461
Water Resource Analysis	Hydraulic modelling in support of option capacity selection	685	14	699	660
	- *Modelling team*			*492*	*464*
	- *Software licenses*			*207*	*195*
Stakeholder and Customer Engagement	Formally conducted research into stakeholder and customer views and preferences and engagement on the SROs as part of progressing scheme development and consenting requirements	451	11	462	436
Assurance	External Assurance undertaken by [redacted] and with support on data analysis from the SW team, data provided to SW Board prior to Board Assurance statement.	333	0	333	314
Sub-total		7,633	1,739	9,372	8,842

As part of the Gate 1 process, Ofwat requested more information regarding SW's programme management and legal costs. SW provide further detail of those cost categories below.

<u>Programme management and PMO costs</u>

Water for Life Hampshire (WfLH), including the SROs, is a uniquely defined programme of works for SW, encompassing a substantial range of projects that are required to meet the full requirements of a wide-reaching WRMP19 as secured by the S.20 agreement between SW and EA. The Programme is delivering projects that range from the SROs (new sources of water), new network infrastructure, bulk supplies and associated structures through to source protection and demand reduction projects. WfLH is a mixed and systems solution approach. The SROs are core and integral projects within the delivery of the system solution.

In addition, the SRO, (as well as the overall WfLH Programme and WRMP19 Preferred Strategy) is under an obligation for SW to use its 'All Best Endeavours' to deliver.

The SROs have the added challenge of its stakeholder complexity and the Programme schedule both reflects the high level of engagement, its criticality to timing and related activities, such as non-statutory and statutory consultations, DCO Examination and DPC pathway. The SROs will therefore be subject to increased levels of engagement, visibility and accountability for performance as it moves into delivery mode. Further details of what will be delivered during the Gate 3 period are below.

As a result of these unique needs, delivery drivers and obligations, SW recognises that it is best set to meet these challenges with success with a defined and focused approach to SRO project delivery, within a wider and consistent approach to project and programme management and project controls. This includes a specific delivery structure, governance and reporting, fully enabled by a PMO with strong project controls and information management at its core. Investment in and commitment to this approach is expected to strengthen overall performance delivery and provide the required visibility and decision-making which will secure WfLH delivery targets and performance efficiency over time.

The PMO is externally resourced, using a competitively tendered framework and is intended to provide, project controls, timely and data-driven management information and reporting, specialist project management and assurance. The PMO is intended to be integrated into the SW business systems so that a full best practice project and programme management approach is applied.

It should be noted that as SW have a relatively large number of SROs, which are complex in nature and are required to be delivered on an accelerated timeline in order for SW to meet SW's statutory duty to supply water and against the 'all best endeavours' obligation. As such, they have required substantial management at a programme level to ensure effective and integrated delivery of the SROs and the programme as a whole. This means that SW's costs are unlikely to be easily comparable to other companies that are progressing through the Gateway process, even if a common definition of 'programme management' were to be in place.

SW's programme management costs in SW's Gate 1 submission may have appeared high, due to SW using a very broad definition of 'programme management', which included aspects such as drafting support on certain documents, and assurance activities. For the Gate 2 submission, SW has sought to address this feedback by providing a cost breakdown at a more granular level. There is no single definition of 'programme management' across the sector.

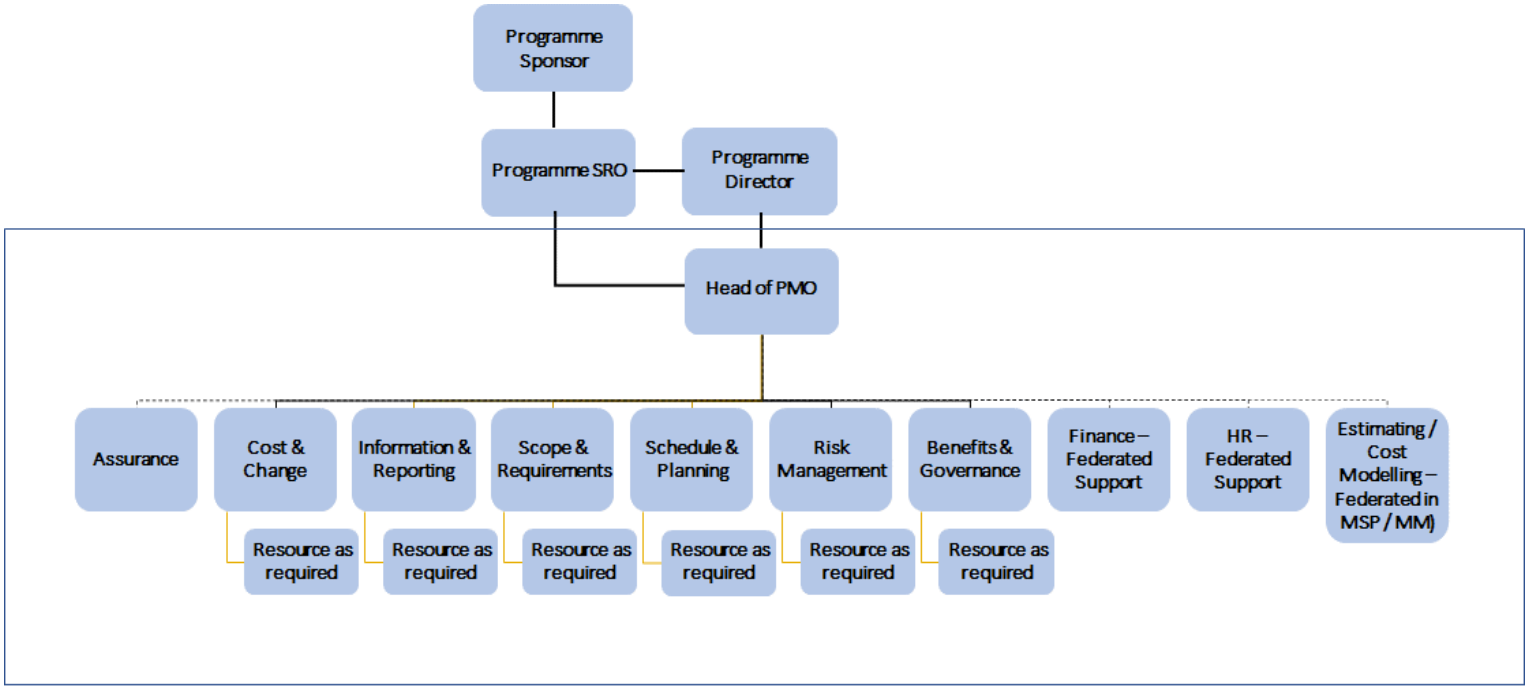
Unlike smaller single solutions / projects, the SRO options are much more complex, are several times more costly, and will take longer to complete. The water industry saw many recent major projects run into severe budget and/or schedule problems, partially due to lack of adequate pre-planning and complex project construction experience by many of the project participants (investor, suppliers, construction contractors, etc.).

Therefore, the main purpose of the PMO is to:

- Become an extension of Southern Water's project organisation by providing experienced personnel with recent major water plant construction expertise.
- Support SW with early project decisions, by providing best practices and lessons learned within the recent water and related plant construction industry drive and coordinate the programme.
- Control and allocate resources.
- Assist with resource augmentation/development.
- Support Southern Water with early technical and engineering resources and coordinate.
- Support Southern Water in defining the technical, commercial, and schedule interfaces between the various options.

- Support Southern Water is allocating budgets, schedules and contingencies to the various options / contracts to be awarded for the overall programme / project.
- Produce appropriate standardised processes and procedures and ultimately, project deliverables.
- Ensure governance and assurance standardised processes are being adhered too.
- Define project control and reporting requirements which also need to be included in the various contract ITTs - these requirements would be based on SW corporate requirements and water construction industry good practices. This function is critical in order to allow aggregation of all the data into a reliable series of project reports that fits within the SW operating model framework.
- Define reporting protocol for each of the contracts, distil these reports and aggregate the data to produce tiered reports for the various SW project and management levels as well as key stakeholders.
- Define and apply project cost contingency allocation, drawdown and justification procedures.
- Define and apply project schedule contingency allocation, drawdown and justification procedures.
- Define and maintain the project risk / opportunities matrix; interface with the various contractors that have activities and risks related to the risk / opportunity matrix.
- Define and maintain the delegation of authority matrix (for contract awards, contingency and schedule modifications, change order approvals, etc.).
- The PMO will evolve as the programme / project execution proceeds, with more and more Southern Water personnel taking key roles as they gain experience.

An organogram of the PMO is shown below:



The Organisation design and the PMO element within it is based on the best practice principles that are articulated within Managing Successful Projects and key project and programme management principles that are promoted by the Association for Project Management.

The Programme Organisation (and hence the PMO) covers the entirety of the Section 20 scope. This scope constitutes a major change programme to fundamentally reshape how Southern Water supplies water to its Hampshire customers in the future. The SRO project is a dominant component of the programme financially, but the successful development of the SRO project is entirely contingent with the parallel development of all the other constituent projects and change initiatives. Southern Water has built an organisation that can manage the dependencies, risks and deliver highly complex projects in incredibly demanding timeframes, meeting stakeholder and customer objectives.

The PMO seeks to be single, consistent source of programme and project information and controls, provides right data at the right time to decision-makers in the programme management structure and governance and ensure that a complex programme is delivered with appropriate standards, integration and with an appropriate level of risk and issue management and cost / commercial management. The PMO also provides the programme with technical specialists and advise in order to enhance delivery resilience.

PMO – the PMO is a programme management office with functionality for the programme and its suite of projects, of which the SROs are a part. Therefore, there is an SRO proportion of design, planning and implementation within the PMO activities and some unique SRO work. An examination of PMO team time spent shows that tr 83% of time spent is on the SRO and the remaining 17% is on the rest of the programme (see section 1.1.6). Below is a summary of overall PMO activities with unique SRO activities highlighted:

- **Head of PMO** leading an engaged PMO team as it drives and supports the development of the programme transformation strategy and implements programme management controls. Providing programme resource management controls and ensuring interface management across the projects and SW. Engaged in SRO specific daily, weekly governance and reporting and resource support to meet RAPID process requirements.
- **PMO transformation team** developing a transformation delivery strategy including programme structure and organisation including the requirements for delivery of SRO projects.
- **Governance Lead** delivering a tailored governance framework for the programme and SRO specific requirements.
- **Reporting Lead** providing a tailored reporting suite for the programme and projects, aligned to programme governance, including specific SRO workstream and activity progress.
- **Risk management Lead** providing a programme risk strategy, deploying a risk management framework, risks management toolset and establishing a monthly risk review cycle for programme, projects, tailored to the requirements of the programme and aligned to best practice SW. This includes SRO risk registers and tracking, reporting.
- **Cost Lead,** capturing and controlling programme and project costs and cost reconciliation including SRO specific cost elements and the requirements for cost information in relation to RAPID.
- **Scope & requirements Lead** developing project initiation documents to secure scope, resource and funding for projects. Preparing, analysing and reporting on G2. Submission process and documents, developing and coordinating the Options Appraisal methodology, and process. Coordinating the interface between the SRO development teams to ensure that there is appropriate focus, strategic direction, resource, schedule, risks management and ensures the maturity of the solutions (SROs) for the Option Appraisal
- **Planning and controls Lead** establishing activity schedules (P6) for the programme and projects, including planning workshops, interface management and supporting risk reviews. Within programme planning, specific SRO activity schedules and programme linkages established for submission.
- **Benefits Lead** formalising a baseline programme and projects benefits tracker, developing an asset strategy.
- **Management Information Lead** establishing a programme / PMO handbook with all key and current programme information, processes, tools. Developing a shared working space and library. Developing a programme communications framework. Handbook contains programme wide information which includes SRO and SRO specific information.
- **Programme and project assurance Lead** coordinating internal and external assurance of SRO submissions and providing SRO assurance to programme and SW governance.

The PMO function provides both strategic and tactical oversight of all workstreams and deliverables. SW's programme management costs relate to Southern Water senior delivery management. A breakdown of the key cost categories is provided below.

PMO:

PMO management, cost control, and authoring support

This includes the Head of PMO (see above for further details).

In addition to standard PMO activities, SW's PMO provides overall strategic steer and guidance on asset strategy issues across the programme. In particular, this relates to the coordination of development of the water recycling asset strategy for Southern Water. This activity is relevant to, and has informed the development of, options B.2, B.4, and B.5.

The PMO also developed and tracks SW's approach to benefits management. This included:

- Development of a project initiative document (initial scoping and structuring).
- Scoping SRO requirements, with linkages into how the options are managed.
- Formalising a management framework and baseline tracker. This was to assess the benefits relative to the deployable balance deficit.

The PMO also tracks programme costs, risks, and contributed towards authoring parts of the Gate 2 documentation.

PMO Transformation

SW commissioned [redacted] to assess and propose a transformational delivery strategy for the programme. The programme approach, structure and organisation design and the PMO element within it, is based on the best practice principles that are articulated within Managing Successful Projects and key project and programme management principles that are promoted by the Association for Project Management. This was supported with technical and engineering resources.

Future Needs Assessment

This is the analysis of future water demand that was agreed at the Interim Update. This expenditure relates to the technical director's costs.

Assurance

Third party assurance from [redacted] is captured separately. These costs relate to internal assurance activities provided by SW's PMO function. This has involved overseeing the workstreams, and the documentation being produced, and providing targeted challenge throughout the Gated process.

Planning

Scheduling of work logic and planning of the overall programme. Identifying critical path activities, practical delivery interactions and interdependencies to enable work force planning, cost forecasting, and output tracking.

As described in section 1.1.6, some of the PMO costs have been allocated to non-SRO projects. See section 1.1.6 for details.

Programme management:

- Programme director – providing overall leadership and direction to the programme.
- Programme management – this relates to internal coding time for SW's Head of Delivery, Chief Engineer, and a senior project manager of all the capital elements of the programme.
- Programme sponsor support - interface between SW sponsor, briefing senior leadership on progress, managing key decision phase planning, and support of programme strategy.
- Submission development – preparation of concept design templates, support to workstream in drafting key submission documents and supporting technical annexes, reporting to executive on submission development, and formatting support.

Legal costs

At Gate 1, Ofwat stated that it expected all legal advice to be itemised and evidenced.

It is important to note that the DCO process, which offers numerous benefits from a consenting ('one stop shop' approach) and powers perspective, is based on the key principle of the application being 'front loaded' in terms of assessment, appraisal and stakeholder engagement, creating a sound foundation. For that reason, there is significant preparatory work to be undertaken in relation to the consenting workstream, as set out below. All of this work is important in order to ensure a compliant, robust and fully evidenced DCO application that is ready for Examination and is best placed to present a strong supported case to secure consent and ultimately the delivery of the Selected Option.

The selected SRO at Gate 2, if different from the Base Case, will need to be considered in the context of how it aligns with the WRMP and whether any update is required to the plan and whether that triggers the need to consult on the new Selected Option being included in the WRMP. In addition, paragraph 1.4.5 of the draft National Policy Statement for Water Resources Infrastructure provides that where the need case for a project is established in a WRMP, then the need for the project does not need to be considered in the DCO investigation or in Examination. As such the work outlined below in relation to the interface between the Selected Option and the WRMP is directly connected to the SRO workstream and is essential work resulting from the RAPID Gated process, as required by the draft National Policy Statement for Water Resources Infrastructure.

In addition, there are important interfaces between the selected SRO and the emerging Regional Plan (WRSE). The selected SRO will need to be reflected and taken account of in the Regional Plan and will be subject to consultation as part of the Regional Plan. Similarly, the selected SRO will

need to be taken into account when considering WRMP24, which must in turn also reflect the Regional Plan. As such the work outlined below in relation to WRSE and the WRMP is directly connected with the interfaces between those plans and the delivery of the Selected Option.

SW provide below a breakdown of the key cost components of the legal costs incurred:

Regulatory support

This covers a range of activities, including:

- RAPID Interface and Gated Process – legal advice inputting into the Gate 2 deliverables, reviewing and assisting with Interim Update and Gate 2 documents, attendance at peer review meetings (where necessary) and legal input into matters arising out of Gate 1 Final Determination.
- Options Appraisal Process – legal input and advice on the design of the Options Appraisal Process (including the MCDA, Consenting Evaluation and overall decision making stage), input and review of the criteria for the process, and input and review of the results to help ensure a legally robust process is designed to withstand future challenges.
- Future Needs Assessment and Option Evolution Plans – legal input into work undertaken to understand future needs and how the SROs may evolve to meet that need.
- Environmental appraisals – scoping support for the strategic environmental assessment, Water Framework Directive Screening Assessment, Habitats Regulations Assessment, and carbon appraisals required for the Gate 2 submission.
- Stakeholder support – review of engagement plans, and attendance at RAPID meetings.

Consenting

This covers a range of activities, including:

- Consenting strategy - input into optioneering, advice on the scope of DCO and DCO procedural requirements, and input into the preparation of a policy compliance statement.
- Site selection and scheme development – legal review of the site selection documentation, legal review of pipeline route selection methodology and criteria, and legal input into the development of preferred site selection configuration.
- Consenting Evaluation – legal input into the development of the methodology and the criteria for the Consenting Evaluation and on the outputs and how this feeds into the wider Options Appraisal Process to help deliver a legally robust optioneering process to withstand challenge at a later DCO Examination.
- Consultation and engagement – review of materials for non-statutory consultation and legal input on points arising from consultation feedback, and legal review of the draft SOCC and comments from LPAs. Assistance with the preparation of materials for stakeholder engagement and on particularly points raised by stakeholders.

- Section 35 Direction – advice and support in relation to project description, submission materials and Defra engagement for the Base Case, and then more recently the Selected Option.
- Land and property – legal advice on powers of entry and engagement with landowners, legal support on land access strategy and programme for EIA and other survey purposes, land referencing methodology and review of scheme boundaries ahead of statutory consultation.

Procurement and Contracting

- Advice in relation to informal market engagement exercise.
- Review and feedback in relation to the Scheme Eligibility Assessment.
- Review and feedback in relation to the Tender Model Selection Report.
- Review and feedback in relation to the Procurement Implementation Plan.
- Review and Feedback in relation to the Evaluation Framework.
- Advice and input into preparation of the commercial contract with the CAP and attendance at working groups to inform approach to contract.

General (cross cutting)

- Strategic advice in relation to the consenting, regulatory approval and delivery of the SROs.
- Attendance at project meetings.
- Advice and input into the delivery schedules for the SROs.

Planning and consenting

- Embedded Planning and Section 35 Support – SW commissioned specialist consultants to provide support on the DCO planning and section 35 development, and submission.
- [redacted] team undertaking site and route selection process using HRA principles.
- Develop robust method to support corridor selection.
- Planning and consenting lead co-ordination role.

Procurement and Commercial

In order to appropriately support the programme a dedicated Procurement and Commercial team has been created specifically for the programme. The team has been recruited through a combination of secondments in from other Procurement and Commercial teams, fixed term contractors, and resources from Southern Water's Commercial Services resource augmentation framework. For Gate 2 SW have been operating with a team of 5

Procurement managers and 3 Commercial managers who are supplemented by SME resources as needed. These resources were allocated to support the development and implementation* of the acquisition strategies for each of the SROs and the associated Procurement and Commercial requirements relating to the procurement of the main Competitively Appointed Provider (CAP).

Examples of main activities include:

- Market engagement for desalination, market engagement with potential CAP and RO membrane suppliers, key heads of terms for CAP contract drafted in preparation for market engagement on preferred option.
- Procurement of contracts for Enabling services, including surveys, tender for DCO planning support service.
- Sourcing Strategy completed, tender issued to market and initial PQQ responses received.
- Reverse Osmosis (RO) membranes strategy required to de-risk the procurement of RO membranes for Desalination plant.
- Running mini competition for DPC consultancy support, coordinating the activity with [redacted] and development of Procurement and Commercial Gate 2 papers and draft Control point reports.

Procurement support

This covers a range of activities, including:

- Procurement strategy – advice relating to the DPC procurement strategy.
- Risk workshops - work on tender model, risks and procurement.
- Membrane vendor – support in the contract development for membrane vendor.
- Integrator and Designer – review of contract for Integrator and Designer.

Other common cost key areas of spend:

Direct Procurement for customers (DPC) support

This has included:

- Value for money analysis:
    - Review of Ofwat's standard assumptions to establish their applicability for Southern Water's DPC candidates. Benchmarking exercise, focusing primarily on Ofwat's financing cost and efficiency assumptions. This exercise has considered precedents from a selection of comparable projects across various infrastructure sectors and was primarily based on desktop research.
    - Assessment of market engagement feedback identifying implications for value for money analysis
    - Value for money analysis using base case, high/low assumptions and market engagement insights identifying key value drivers under a DPC delivery route.

- Articulation of the tender model:
    - Established an evaluation framework that was used to select the most appropriate late tender model from the 4 variants that have been identified for further progression in Gate 1 for each of the solutions respectively.
    - Assessment of market engagement feedback identifying implications for the tender model selection.
    - Identifying implications for risk allocation and commercial model.
    - Consider early contractor engagement and test concept with potential bidders as part of the informal market engagement.
- Development of a high-level commercial model for DPC delivery:
    - Review of comparable benchmarks based on desktop research. In total 14 precedents have been assessed in the infrastructure sector to benchmark different commercial structures and contracting principles to identify the most suitable commercial model for the solutions considered.
    - Detail the proposed commercial model for the following features: Contract length, Termination and termination payment, Asset handover at the end of the term, Residual value treatment, Approach to cost fixing, Payment mechanism, Acceptance and late service commencement and Operational performance and performance incentives.
    - Assessment of benefits and risks associated with various model feature options.
    - Evaluation of various contract length options based on precedents, potential market appetite and maintenance profile, focusing on the value for money proposition to customers.
    - Set out high level risk allocation identifying the party/parties responsible of the key risks related to project delivery throughout the asset life.
    - Test strawman model with the market and reflect feedback from potential bidders in the proposed commercial structure.
    - Separate commercial model has been developed for each of the solutions considered taking into account the scheme specific characteristics of the SROs.
- Outline implementation plan:
    - Separate implementation plan has been developed for the DPC and non-DPC delivery route for each of the solutions.
    - Design high level evaluation framework and set out potential criteria to be used at the various stages of the CAP tender in line with SW and Ofwat objectives.
    - Consider precedents from PFI/PPP type projects in the water sector to identify key goals and evaluation criteria for the delivery of large water projects of similar type and risk profile.
    - Set out information to be provided to CAP bidders and outline contractual documents.
    - Draft procurement governance structure.
- Informal market engagement exercise:
    - Design informal market engagement exercise (establish objective, define list of invited parties, prepare market engagement material and schedule meetings).

  - Conduct 1-to-1 informal market engagement session with 21 potential bidders over a period of 3 weeks to test emerging views on tender and commercial model, implementation plan and value for money analysis.
  - Summarise feedback from the market engagement and key takeaways for the proposed DPC model.
- Drafting the Gate 2 submission:
  - Preparation of the Gate 2 submission for each of the SROs in line with RAPID's guidance and requirements.
  - Coordination with stakeholders to ensure alignment with other sections in the submission.
  - Engagement with the legal team and assistance to the multi-staged review and assurance process.

The DPC workstream has been managed holistically. Therefore, cost allocation to different outputs in Table 7 have been based on management judgement to indicate the relative scale of activity for the different components.

Development and implementation of option selection framework

The role of this workstream was to undertake a 'best value' appraisal of the six options that were progressed into the Options Appraisal Process. This involved developing an assessment framework that optimised potential costs and impacts, such as whole life carbon impacts, with only partial monetary or quantified information to distinguish the options. This included the development and implantation of a multi-criteria decision-making appraisal (MCDA) framework. This involved undertaking the following tasks:

- A comprehensive review of policy guidelines and Gate 1 documentation.
- An evaluation of the potential themes for the options appraisal.
- Identifying sub-criteria for the MCDA and the availability of data for each criterion.
- Developing scoring guidance for qualitative criteria and weighing scenarios.
- Sourcing input information and converting inputs into a comparable assessment of options.
- Qualitative, quantitative and monetised impact assessments against agreed sub-criteria.
- An overall MCDA assessment to rank the options (combining the outputs of all the impact assessments and weighting scenarios into relative scores against Best Value).

The key outputs were:

- Holistic appraisal of the different infrastructure options.
- 20 different scenarios in which options were ranked in terms of Best Value.
- Sensitivity analysis of options, flexing inputs such as cost.
- Qualitative and quantitative evidence of Best Value options.
- Regular updates to internal governance groups and to regulators.

The work was broadly structured into the following workstreams:

- Scoping of Best Value Appraisal
  - Reviewed guidance docs
  - Began considering CBA/MCDA framework
  - Met NC advisers, began procuring inputs to analysis (via pro formas)
  - Agreed appraisal period
  - First draft of appraisal themes and sub-criteria
  - MCDA Working Group identified
- Development of MCDA Framework
  - Defined sub-criteria in more detail with precedents
  - Identified sub-criteria evaluators
  - Defined infra operating regime more clearly
  - Developed MCDA model
  - Defined and received inputs from technical advisers
  - Scoring guidance sessions and consensus workshops
- MCDA results, socialisation and write up
  - MCDA analysis completed
  - Legal review of docs
  - Practitioners meeting with RAPID
  - Draft results socialised with working group and SW boards
  - Explained results to regulators
  - Authored OA annex
- Supplemental MCDA revalidation
  - Revised option scope tested with subject matter experts
  - Qualitative assessment against criteria
  - Authored revalidation report

The outputs of the MCDA informed the overall decision-making stage of the Options Appraisal Process, which resulted in the ranking where the desalination options were lower performing than the other options assessed at this time and at this location. As a result, desalination was removed from the Gated Process at the Interim Update.

Hydraulic modelling in support of option capacity selection

This piece of work involved two stages; calculation of the supply deficit and required capacity of the new sources of water and (2) the required transfer network and in particular, infrastructure. The costs consist of two main elements:

- A specialist team brought in to conduct the modelling with very specific modelling and software expertise.
- Modelling software licenses for [redacted] and [redacted] The former is used for dynamic capacity modelling and the latter models the distribution network and utilisation. Combined, this modelling and was integral to scenario development for correct sizing of the SROs.

Licenses were procured from framework suppliers which were competitively tendered to provide services to SW throughout AMP7.

Further detail on any of the above items can be provided upon request.

Table 8 – Gate 2 and early Gate 3 costs – total summary, outturn prices

Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)
Desalination	3,022	668	3,690
Water recycling	2,508	2,649	5,157
Havant Thicket alternatives	350	1,212	1,561
Common costs	7,633	1,739	9,372
Total	13,513	6,268	19,780
Total, 2017/18 prices	12,748	5,913	18,661

Allocating the common costs to each SRO involves an element of judgement. Moreover, SW have managed SW's spend at a programme level, as SW are seeking to deliver an overall programme that addresses SW's water supply needs. For illustrative purposes, SW have allocated SW's common costs to SROs using two approaches: 1) an even proportioning; 2) in line with the expenditure directly incurred on each SRO. These are set out below;

Table 9 – Gate 2 and early Gate 3 costs – total summary (even proportioning of common costs), outturn prices

Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)
Desalination	5,566	1,248	6,814
Water recycling	5,052	3,228	8,281
Havant Thicket alternatives	2,894	1,791	4,685

Table 10 – Gate 2 and early Gate 3 costs – total summary (common costs allocated in line with direct SRO cost), outturn prices

Description	Gate 2 (£k)	Early Gate 3 (£k)	Total (£k)
Desalination	6,945	925	7,013
Water recycling	5,763	3,666	9,800
Havant Thicket alternatives	804	1,677	2,967

1.2.2. New RAPID format

The below tables present the data using the new format that RAPID has requested. The figures are in 2017/18 prices.

Table 11 – Desalination and 1/3 Common Activities (2017/18 prices)

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
Programme & Project Management	93	0	1.8%	0.0%	Project Management to lead and manage the projects.
	263	181	5.0%	15.3%	The PMO provides both strategic and tactical oversight of all workstreams and deliverables, whether internal or external. The PMO provides project controls, including tracking delivery of outputs, progress to schedules, costs tracking, resource oversight, monitors the interfaces between the workstreams and with the wider business, provides project management services to projects, as required.
	266	128	5.1%	10.9%	Southern Water senior delivery management of both projects and programme

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
	105	0	2.0%	0.0%	External Assurance undertaken by [redacted] and with support on data analysis from the SW team, data provided to SW Board prior to Board Assurance statement.
Feasibility Assessment and Concept Design	796	609	15.2%	51.8%	Specialist Process engineering team using catchment sampling data (sea water) to develop the process design. Multi discipline Engineering team developing the MECH, elect, civil, structural aspects of the concept design.
Option benefits development and appraisal	86	0	1.6%	0.0%	Constructability review undertaken by SW Delivery Partner to take the pipeline corridors to the next level of design development.
	81	0	1.5%	0.0%	Cost estimation and embedded carbon calculation
	197	0	3.8%	0.0%	Option Appraisal Framework consistent with Green book and consenting requirements
	216	4	4.1%	0.4%	Hydraulic modelling - analysis and software licences
Environmental Assessment	142	21	2.7%	1.8%	Includes site selection, habitat phase 1 assessment. Land referencing and negotiating access.
	1,059	0	20.2%	0.0%	Environmental, Ecological, Terrestrial and Marine Surveys
	141	13	2.7%	1.1%	Work undertaken by Environment Agency and Natural England
Data Collection, Sampling, and Pilot Trials	589	0	11.2%	0.0%	Data collection for desalination to understand water quality which informed concept design.
Procurement Strategy	211	81	4.0%	6.9%	Southern Water resources to provide procurement and commercial management of External Supply Chain required for Gate 2.
	276	40	5.2%	3.4%	Value for money analysis, Commercial model development, Late Tender model development, Market Engagement, Development of Implementation Plan. Development SOC, Development of Procurement Plan, Development of Gate 2 submission, Senior management and board sessions
Planning Strategy	159	25	3.0%	2.1%	Specialist planning resource to advise on the consenting on the DCO process
	0	0	0.0%	0.0%	Airborne ground facing LIDAR survey confirming topography and sensitive receptors
	56	6	1.1%	0.5%	Ricardo commission on Natural Capital & Biodiversity gain
	142	3	2.7%	0.3%	Formally conducted research into stakeholder and customer views and preferences

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
Stakeholder Engagement	87	0	1.7%	0.0%	Non-statutory consultation
Legal	167	30	3.2%	2.5%	Legal advice – regulatory
	36	30	0.7%	2.5%	Legal advice – consenting
	86	6	1.6%	0.5%	Legal advice - procurement, strategy and Secondment
Other	0	0	0.0%	0.0%	
Total	5,324	1,207	5,324		
Gate Allowance	5,610	13,090	5,610		
Gate under/overspend	-286	-11,883	-286		

Table 12 – Water Recycling and 1/3 Common Activities (2017/18 prices)

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
Programme & Project Management	92	0	1.9%	0.0%	Project Management to lead and manage the projects.
	263	181	5.5%	5.9%	The PMO provides both strategic and tactical oversight of all workstreams and deliverables, whether internal or external. The PMO provides project controls, including tracking delivery of outputs, progress to schedules, costs tracking, resource oversight, monitors the interfaces between the workstreams and with the wider business, provides project management services to projects, as required.
	266	128	5.6%	4.2%	Southern Water senior delivery management of both projects and programme
	105	0	2.2%	0.0%	External Assurance undertaken by [redacted] and with support on data analysis from the SW team, data provided to SW Board prior to Board Assurance statement.
Feasibility Assessment and Concept Design	607	479	12.7%	15.7%	Specialist Process engineering team using catchment sampling data (sea water) to develop the process design. Multi discipline Engineering team developing the MECH, elect, civil, structural aspects of the concept design.
Option benefits development and appraisal	81	0	1.7%	0.0%	Cost estimation and embedded carbon calculation
	197	0	4.1%	0.0%	Option Appraisal Framework consistent with Green book and consenting requirements
	216	4	4.5%	0.1%	Hydraulic modelling - analysis and software licences
Environmental Assessment	118	34	2.5%	1.1%	Includes site selection, habitat phase 1 assessment. Land referencing and negotiating access.
	35	0	0.7%	0.0%	Environmental, Ecological, Terrestrial and Marine Surveys
	141	13	3.0%	0.4%	Work undertaken by Environment Agency and Natural England
Data Collection, Sampling, and Pilot Trials	0	609	0.0%	20.0%	The ceramic membrane design is relevant for a number of SRO alternative options (recycled water and raw water transfer) as the technology will be able to treat water from a variety of sources including recycled water. Running a pilot plant now will inform design and operations in the future should the alternative options go ahead
	791	770	16.6%	25.3%	Design Consultancy undertaken by Internationally recognised specialist in water recycling design. Input includes engineering, construction best practice, analysis of the sampling data. Being undertaken in Gate 2 period to enable SW to collect sufficient data to support DWI approval of water recycling in the UK.
	723	606	15.2%	19.9%	Proving the concept and application of the process design. Collecting data to evidence the process efficacy of the water design. Being undertaken in Gate 2 period to enable SW to collect sufficient data to support DWI approval of water recycling in the UK.

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
Procurement Strategy	211	81	4.4%	2.7%	Southern Water resources to provide procurement and commercial management of External Supply Chain required for Gate 2.
	276	40	5.8%	1.3%	Value for money analysis, Commercial model development, Late Tender model development, Market Engagement, Development of Implementation Plan. Development SOC, Development of Procurement Plan, Development of Gate 2 submission, Senior management and board sessions
Planning Strategy	159	25	3.3%	0.8%	Specialist planning resource to advise on the consenting on the DCO process
	0	0	0.0%	0.0%	Airborne ground facing LIDAR survey confirming topography and sensitive receptors
	56	6	1.2%	0.2%	Ricardo commission on Natural Capital & Biodiversity gain
Stakeholder Engagement	142	3	3.0%	0.1%	Formally conducted research into stakeholder and customer views and preferences
Legal	167	30	3.5%	1.0%	Legal advice – regulatory
	36	30	0.8%	1.0%	Legal advice – consenting
	86	6	1.8%	0.2%	Legal advice - procurement, strategy and Secondment
Other	0	0	0.0%	0.0%	
Total	4,766	3,046			
Gate Allowance	5,370	12,530			
Gate under/overspend	-604	-9,484			

Table 13 – Havant Thicket Raw and 1/3 Common Activities (2017/18 prices)

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
Programme & Project Management	113	0	4.1%	0.0%	Project Management to lead and manage the projects.
	263	181	9.6%	10.7%	The PMO provides both strategic and tactical oversight of all workstreams and deliverables, whether internal or external. The PMO provides project controls, including tracking delivery of outputs, progress to schedules, costs tracking, resource

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
					oversight, monitors the interfaces between the workstreams and with the wider business, provides project management services to projects, as required.
	266	128	9.7%	7.6%	Southern Water senior delivery management of both projects and programme
	105	0	3.8%	0.0%	External Assurance undertaken by [redacted] and with support on data analysis from the SW team, data provided to SW Board prior to Board Assurance statement.
Feasibility Assessment and Concept Design	109	422	4.0%	25.0%	Specialist Process engineering team using catchment sampling data (sea water) to develop the process design. Multi discipline Engineering team developing the MECH, elect, civil, structural aspects of the concept design.
Option benefits development and appraisal	81	0	3.0%	0.0%	Cost estimation and embedded carbon calculation
	197	0	7.2%	0.0%	Option Appraisal Framework consistent with Green book and consenting requirements
	216	4	7.9%	0.3%	Hydraulic modelling - analysis and software licences
Environmental Assessment	71	21	2.6%	1.2%	Includes site selection, habitat phase 1 assessment. Land referencing and negotiating access.
	0	83	0.0%	4.9%	Environmental, Ecological, Terrestrial and Marine Surveys. Too late to feed into Gate 2 but required to maintain project progress.
	141	13	5.2%	0.8%	Option Appraisal Framework consistent with Green book and consenting requirements
	38	8	1.4%	0.4%	Portsmouth Water costs advising on environmental constraints, available pipe routes, location of inlet/ abstraction connections at Havant Thicket, informing the high lift pumping station site location, development of the joint risk and joint stakeholder engagement strategies and performing joint regulator engagement.
Data Collection, Sampling, and Pilot Trials	0	609	0.0%	36.0%	Value for money analysis, Commercial model development, Late Tender model development, Market Engagement, Development of Implementation Plan
Procurement Strategy	211	81	7.7%	4.8%	Southern Water resources to provide procurement and commercial management of External Supply Chain required for Gate 2.
	276	40	10.1%	2.4%	Value for money analysis, Commercial model development, Late Tender model development, Market Engagement, Development of Implementation Plan. Development SOC, Development of Procurement Plan, Development of Gate 2 submission, Senior management and board sessions
Planning Strategy	159	25	5.8%	1.5%	Specialist planning resource to advise on the consenting on the DCO process
	0	0	0.0%	0.0%	Airborne ground facing LIDAR survey confirming topography and sensitive receptors

Description	Gate 2 (£k)	Early Gate 3 (£k)	G2 % of Total Expenditure	Early G3 % of Total Expenditure	Description of Activity
	56	6	2.0%	0.4%	Ricardo commission on Natural Capital & Biodiversity gain
Stakeholder Engagement	142	3	5.2%	0.2%	Formally conducted research into stakeholder and customer views and preferences
Legal	167	30	6.1%	1.8%	Legal advice - regulatory
	36	30	1.3%	1.8%	Legal advice - consenting
	86	6	3.1%	0.4%	Legal advice - procurement, strategy and Secondment
Other	0	0	0.0%	0.0%	
Total	2,730	1,690			
Gate Allowance	1,128	1,859			
Gate under/overspend	1,602	-169			

1.3. Gate 3 cost forecast

At the interim update, SW ceased activities relating to the desalination SRO. SW now has a Selected Option and Back-up Option and is progressing into the delivery phase. Given the critical point SW is at in SRO development , SW needs to scale up in order to ensure timely delivery in 2030.

It is recognised to deliver the new Selected Option that a delivery date of 2030 is required, and SW is using all best endeavours to meet that date. SW's plan of work has been developed in line with this requirement.

Following the interim update, SW have developed a programme of work to progress the Selected Option (and Back-up Option, to the extent required). This programme of work is still being refined and is subject to further change.

A summary of SW's total Gate 3 forecast spend until the June 2022 RAPID submission date is set out below, and the forecast position to November 2022 (see below for further details). For details on the activities that make up this forecast, please refer to the Annex 10 - G3 Activity Plan.

Table 14 – Gate 3 expenditure forecast (2017/18 prices)

Description	Early Gate 3 expenditure	Gate 3 expenditure post Gate 2 submission	Total Gate 3 expenditure	Gate 3 funding allowance	Delta to allowance	Forecast costs to November 2022
Water recycling / Havant Thicket	3,213	15,611	19,022	14,389	+6,630 (+46%)	10,017
Water recycling back up	1,523	613	2,185			498
Desalination	1,177	-	1,177	13,090	-11,883 (-91%)	-
Total	5,913	16,225	22,284	27,479	-5,253 (-19%)	10,516

As can be seen from the above, the early de-selection of desalination as an option from the Gated Process has resulted in a material saving against the originally envisaged cost allowance.

Removing desalination from the comparison, costs for Gate 3 are above the originally envisaged allowance to develop the remaining options.

This is primarily due to:

- The continuation of the pilot trials (see the executive summary of this annex). In Gate 3, SW forecast to spend £4.9 million on the Otterbourne and Peel Common pilot trials.
- The additional activity and intensity proposed for Gate 3, which will result in:
    - A substantial amount of the required surveys will have been carried out. Intrusive investigations are expected to commence end of Q1 2022 in order to facilitate information required for Pipeline route selections. There are seven evaluation workshops planned to perform route selections. The pipeline selection process is expected to be concluded in Aug 2022, when the final preferred route will be fed into the design snapshot 2 for Statutory consultation. The Design snapshot 2 is currently planned for Oct 2022.
    - A materially more detailed and mature level of design. This includes greater cost certainty, and risk identification. The 1st Feb 2022 design snapshot 1 will feed into the non-statutory consultation, at which point the design information will be largely high level, whereas for statutory consultation, the level of design will need to be in much more detail. It is also

envisioned that the snapshot 2 design will also feed into the Procurement Draft Tender Documentation which will facilitate Control Point D submission.

- Significantly more progressed DCO investigations, with many being completed (as opposed to having just been started, which was what was envisaged in the initial indicative Gate 3 activity guidance in the final determinations). Some environmental works will proceed without waiting for Scoping document submitted to PINS. This creates an advantage of front-loading the environmental activities, in order to allow any further top-up surveys potentially required to start Q3 2022, rather than wait for phase 1 environmental surveys to start end of Q1 2022, and phase 2 potentially not start till Q1 2023.
- A construction assessment on early deliverability considerations as part of the DCO's preliminary environmental information report.
- The non-statutory consultation will be completed. This is currently planned to start Jun 2022, and complete by Jul 2022.
- Preparations for a statutory consultation will be well underway. DCO and planning consultants to be onboarding end of Q1 2022, who will assist to provide clarity to what deliverables will be required by the DCO. This consultant will be expected to work collaboratively with the EIA specialist, enabling team, design team, construction support team to understand the level of maturity of information will be required to satisfy DCO consent requirement, in the view to 'get it right first time'. Consultation specialists will also be on-board to help prepare for and deliver consultation events that meet the 'adequacy of consultation' legal test.
- DPC market engagement round 1 will be completed. This is expected to commence Jan 2022, conclude by April 2022, analysis will be conducted post-engagement to understand market appetite towards DPC-route. Market Engagement 1 is a key activity with results to be fed into both Control Point C and the Gateway process. Preparation work for Market Engagement 1 is well underway and engagement materials are expected to be approved by end of 2021, with PIN to be issued to market 2nd week in Jan 2022.
- DPC tender documentation largely complete. This is planned to be developed from Q1 2022 and iteratively getting updated as more information becoming available, which the final piece to feed into this draft document will be the feedback receive from Market Engagement 2. Market Engagement 2 expects to start Jul 2022 and conclude by Aug 2022. This is largely subject to change dependent on result from Market Engagement 1 feedback (see above for timeline).
- Further progress with stakeholder engagement. This will include (but is not limited to):
    - Jan - Mar 2022 Landowner engagement required for Surveys (both engineering and environmental),
    - Jan to Feb (request for S35 Direction),
    - Mar - Jun 2022 landowner engagement for surveys (engineering and phase 2 environmental),
    - Jun to Aug (Non stat con and collating and analysing feedback),
    - Aug-Sep (submit request for Scoping Opinion).

SW's Gate 3 forecast is on the basis of a June 2022 submission. There have been early discussions with RAPID about the possibility of moving the Gate to November (or potentially later) to enable further development of design and DCO applications. This would help enable greater alignment between the RAPID Gateway process and the DPC Control Points. This could have a number of benefits such as reducing the

risk to the programme of uncertainty resulting from the DPC schedule, and the need for additional consultation. Additional information has been provided on the costs we forecast would occur if Gate 3 were moved to November 2022.

Moving the Gate submission date would result in a greater proportion of costs being incurred prior to Gate 3 submission, as it would result in a materially different set of Gate 3 outputs. These costs are set out below.

SW propose to provide RAPID with a plan including greater definition of Gate 3 activities and associated timelines in February 2022, with a recommendation on whether Gate 3 should be moved to November 2022 or later.

SW would be happy to discuss further any cost forecasting component with Ofwat/RAPID.

1.3.1. Gate 3 delivery incentives

At present the delivery incentive is based on a maximum of 30% of efficiently incurred costs, with the areas for penalty and the amount of penalty being applied subject to a large amount of discretion. SW has now identified a single Preferred Option and is progressing to delivery of this option at the earliest practicable date.

Elsewhere in the PR19 Final Determinations, it is common for infrastructure projects to be incentivised to ensure delivery, to avoid late delivery and that what is delivered meets the needs of the company's customers in an appropriate way. SW proposes to change the incentive structure so that a significant proportion of the penalty applies to project deliverables that are due to occur between Gate 2 and Gate 3.

We have identified the critical path activities for the Preferred Option that will occur in this time, and they include applying for a Direction to use the DCO planning route, completing the DPC control point B and C gates, having reached a sufficient maturity and stability of design to enable the DCO, with confirmation of route and pipeline corridor selection, and others.

A proportionate amount of the penalty should apply to the achievement of these milestones, either individually or as a whole. This would give SW incentives to ensure that overall delivery of the Preferred Option remains on track. It would be possible to create a time window for delivery of each major component of the critical path, a latest date after which the penalty applies, and an increasing penalty as delay increases. A proportion of the penalty would then apply to incentivise a good quality and timely Gate 3 submission. All penalties would be considered as part of the Gate 3 process, not "in flight".

It is likely the, as the scale of activity and hence cost rises with delivery of a large capital project increases, that a 30% penalty of efficient costs will become disproportionate for Gate submissions, as incentives should apply to the timely and sufficient delivery of the project itself. We will provide further detail on this proposal after the Gate 2 submission.

Appendix A: Overview of Activities – Interim Update to Gate 2

1. Background and context

Prior to the original Gate 2 submission date, 27 September 2021, Southern Water (SW) proposed the introduction of an Interim Update – focusing on the outcomes of the Options Appraisal Process, detailed in Annex 5: Options Appraisal, which resulted in the Desalination-based options, options A.1 and A.2, desalination at Fawley supplying 75Ml/d and 61Ml/d, respectively, to Testwood Water Supply Works (WSW), being paused and taken outside of consideration of the RAPID gate process.

Key commitments made by SW in introducing the Interim Update included ensuring that high-level analysis of how the Water Recycling-based and Havant Thicket-based options can be adapted to bee future supply needs, for both SW and Portsmouth Water (PW) requirements. This analysis is a key underpinning component of the review and revalidation of the Options Appraisal, with further depth added to inform assessments related to Adaptability, one of the three overarching Water for Life Hampshire (WfLH) strategic objectives. This high-level analysis is included in other components of the Gate 2 submission, completed for the rescheduled 6 December 2021 submission date.

Although considerations of how the remaining options can potentially adapt and evolve to meet future needs, SW's Section 20 (s20) obligations remain and it must use its "All Best Endeavours" (ABE) to deliver the Selected Option, which has been confirmed as Option B.4. As part of SW's efforts to uphold this obligation, the remaining options have continued to be explored and developed in order to meet SW's 1-in-200-year resilience supply requirements. This document provides an overview of the technical analysis completed in progressing the options between the Interim Update, submitted on 27 September 2021, and the rescheduled Gate 2, submitted on 6 December 2021.

2. Overview of Activities

This section provides an overview of the activities completed and ongoing between the Interim Update and the Gate 2 submission. In Section 2.1, activity overviews have been broken into the respective technical sections included in the detailed technical annexes, Annex 2: Water Recycling and Annex 3: Havant Thicket. Further development of the options has continued, with efforts in specific areas focused on Option B.4, the Emerging Preferred Option at the time of the Interim Update submission.

2.1. Technical Design Progress

2.1.1. Engineering Design

Since the Interim Update, further development of the technical design has been ongoing for the now Selected Option and Back Up options, options B.4 and B.5, respectively. Efforts in developing the technical design has focused on the Selected Option, although there are components of the design which are consistent across each.

A formal change control for the reducing the size of the Water Recycling Plant (WRP) component for the Emerging Preferred Option (now Selected Option) from 61Ml/d to 15Ml/d has been completed.

An Infrastructure Alignment Review, between SW and PW has commenced. The purpose of this review is to understand in detail the technical interfaces (i.e. inlet and outlet connections to the reservoir) between infrastructure for the development of the consented Havant Thicket Reservoir and SW's SROs that interface with the reservoir, including the Selected Option. The delivery of the Havant Thicket Reservoir is further progressed than the delivery of the Selected Option as it has already been consented. As a result, there is a risk that the opportunity to more efficiently deliver components that support the Selected Option are missed – causing there to be increased time and cost implications to SW. The intended outcome of this review is to identify where and how specific components and infrastructure required for the Selected Option can be delivered, including any opportunities to secure the earlier than what would initially be expected, in order to be more efficient by working together and potentially saving costs and saving time.

The programme has completed an early delivery review of "wet commissioning". The purpose of this review was to understand requirements for commissioning infrastructure components that interface directly with Havant Thicket Reservoir, in order to understand the specific requirements that need to be included into the design at this stage. Key outputs from this review are to be included in ongoing design refinements, as mentioned above.

2.1.2. Network Infrastructure

No specific actions to progress hydraulic modelling and other network infrastructure technical analysis have been undertaken since the Interim Update. Further analysis is expected to commence shortly after Gate 2, and preparatory activities have been undertaken, such as mobilising the team to undertake the next stage of the network infrastructure workstream.

2.1.3. Site Selection and Environmental

Commenced preparations for on-site surveys across the proposed sites, including the proposed WRP site and possible pipeline corridors that are being considered and assessed. In terms of landowner engagement, the WfLH programme team has begun contacting landowners regarding obtaining access to sites so that site surveys can be conducted, to inform the next stage of site selection.

Contacting the respective landowners also supports preparations for the next stage of Environmental surveys and assessments. Since the Interim Update, preparations for walk-over surveys have been completed and overwintering bird surveys have been launched across the potential sites identified in the

Gate 2 submission. These sites include the proposed site for the WRP and the proposed pipeline route corridor options that are being considered and assessed. The outcome of these surveys will inform the next stages of the scheme development process.

2.1.4. Planning and Consenting

Further development and refinement of the consenting (Development Consent Order, DCO) methodology has been ongoing since the Interim Update. Development has focused on building out the underpinning detail that informs how the DCO application will be prepared and how it will interface with delivery of the project by the CAP.

Preparation for submitting the request for a section 35 Direction has been undertaken, including drafting the request. There has been engagement with regulators and other statutory bodies relevant to the consenting process, and also with PW on the potential consenting interface between the Emerging Preferred Option and the already consented Havant Thicket Reservoir.

2.1.5. Risk Management

Regular programme risk management is ongoing has continued since the Interim Update. This includes regular workshops with owners from each technical workstream and reporting through existing programme management and governance structures.

2.1.6. Stakeholder and Customer

Commenced the development of a WfLH Programme Stakeholder and Regulator Engagement Strategy. This includes outlining key elements including stakeholders and regulators to be engaged with, engagement responsibilities and associated individuals, frequency of engagement, key strategic messages including overarching pan-programme strategic messages and guidance on engaging with stakeholders and regulators to ensure consistency in what SW and the WfLH programme team communicates externally.

Commenced more regular and structured engagement with PW regarding the interface between the Emerging Preferred Option and the Havant Thicket Reservoir. This includes engaging on key messages regarding the Emerging Preferred Option and supports SW and PW to agree key messages and ensure consistency in the messages communicated externally through future engagement activities.

2.1.7. Cost Modelling

No specific updates to the cost modelling have been undertaken since the Interim Update. Updates to the cost modelling and estimates will be undertaken once technical designs are updated following Gate 2.

2.1.8. Procurement and Commercial

Since the Interim Update key progress related to procurement and commercial activities cover multiple areas. These include collating key elements to be included in future agreements with contractors to deliver the Selected Option and the preparation for market engagement activities.

The WfLH programme procurement team are currently in the early stages of preparing heads of terms and other specific components to be included in any future agreement. This includes holding workshops with various functions of the programme team, including engineering design; operations, regulatory and project controls specialists as part of engagement activities to inform content to be included in the construction contract. A key purpose of this engagement is to understand risks, opportunities and other points of interest that need to be managed and factored into any future construction contract.

These workshops are in their early stages and will continue post Gate 2, with key points to be included in and used to inform market engagement activities, scheduled to commence in Q1 2022.

In addition, the procurement team has commenced preparations for market engagement activities. This includes arranging engagement sessions, preparing presentation materials which includes background on the project, Selected Option and key messages from engagement sessions held with WfLH programme team specialists.

2.1.9. Schedule

The schedule has been reviewed and updated since the Interim Update. The primary sources for changes in the schedule are detailed in Section 3, with schedule updates focused on Option B.4, the now Selected Option. The updates made to the schedule are specifically focused to Option B.4 and the internal milestones to delivering the project, the new dates included through the schedule information in Section 2.9 of Annex 3 Havant Thicket technical.

For clarity, as detailed in Section 3 and through Section 2.9 of Annex 3 Havant Thicket technical, the expected completion date for delivering the Selected Option has remained consistent, forecasting completion in Q1 2030.

2.2. Programme-wide activities

Progress related to option-agnostic items of the programme have continued since the Interim Update, in line with overall programme schedule. Other key activities completed between the Interim Update and the rescheduled Gate 2 submission include re-validation of the Options Appraisal Process, Remodelling of the Supply Demand Deficit, determination of the future supply need and preparation of the high-level option evolution and selected option evolution plans. The activities and analysis completed related to these components are detailed in other documents of the Gate 2 submission.

2.3. Option Evolution and Future Need Considerations

Key primary focus area for the period from the Interim Update to the rescheduled Gate 2 is the high-level evolution assessment of each option, carried forward from the Interim Update. Following the options appraisal process undertake ahead of the Interim Update, which paused the development of the desalination-based options as part of the RAPID process, the potential evolution of the remaining four options (two water recycling-based, options B.2 and B.5 and two Havant Thicket-based, options D.2 and B.4) has been considered.

The high-level evolution assessment completed since the Interim Update has included determining the need to meet supply customer supply needs in a 1-in-500-year drought scenario and identify how the remaining four options could be evolved and adapted to meet this need. This high-level assessment has been utilised to provide greater evidence to the options appraisal process, and specifically assessing the ‘Adaptability’ WfLH programme strategic objective. Details regarding the high-level option evolution, how this informed the option appraisal validation and guided the Selected Option evolution is provided over other supporting documents of SW’s Gate 2 Submission. These details are included over the Annex 12: Option Evolution Plan, Annex 5: Options Appraisal Process (specifically the Interim Update to Gate 2 Addendum) and Annex 13: Selected Option Evolution Plan.

3. Impact to Delivery Schedule

3.1. Overview of Schedule Updates

The introduction of the Interim Update has led to minor changes to some specific stages and milestones within the programme delivery. Although there have been some changes within the schedule, the forecast Deployable Output date **has not changed** for Option B.4 between July and October 2021. The date remains the same within Q1 2030. The sequencing and timing of activities within the schedule has altered, however. The below narrative discusses changes to previously identified key milestones related to specific areas of the programme.

3.1.1. RAPID Gates

The key change between the IU and the Gate 2 submission is the change in the Gate 2 date. This was delayed by just over 2 months in agreement with RAPID. Gate 3 is now proposed for November 2022, which is 5 months later than the current anticipated Gate 3. Gate 4 is positioned within the same timeframe as previous, however the schedule evolution work undertaken between IU and G2 has resulted in a 2-month improvement to the forecast Gate 5 date.

The delay to RAPID Gate 2 had a knock-on impact on some short term deliverables (see below) however did not negatively affect the overall project duration.

3.1.2. OFWAT Control Points

The key change between the IU and the Gate 2 submission is the change in the Control Point A / B date. This has slipped into Q1 2022 as it is linked to the Gate 2 submission. There has been an associated delay in the submission of the Control Point C submission. This is partially related to securing feedback from CP-B, but also involves creating a closer alignment with the planned RAPID Gate 3 submission in November 2022.

Control Point D and E submissions are forecast within 5 weeks of the previous dates, with CP-E being the same date.

The CP-F date has been slightly accelerated by 5 weeks as SW continue to work on improvements to the overarching schedule critical path.

3.1.3. Other Key Milestones

The changes to SW's 'other key' milestones include the updating of SW's WRMP and consolidation of multiple options to a single route forward. The activities supporting these milestones are linked with the outcome from the Gate 2 submission and therefore have been delayed in line with the determination.

3.1.4. Development Consent Order

The key change between the IU and the Gate 2 submission is a change of strategy around Scoping. SW now propose to submit Scoping Opinion to PINS following the non-statutory consultation in June 2022. This will help us to incorporate feedback from the consultation into the request for a Scoping opinion.

3.1.5. Procurement

There has been a slight delay in the procurement of specialist DCO capability although this has not affected the overall schedule. Buildability input has been accelerated.

The only other significant change has been a delay to the planned Phase 2 Ecological Surveys. Again, this has not impacted on critical path activities.

3.1.6. Design

There has been a change in the Design Snapshot dates associated with the non-statutory consultation and the procurement tender documentation. This is due to there being more time for this phase of activity due to the adjusted sequencing of activities detailed above.

The Preferred Route Announcement (PRA) has also been reprofiled to follow the non-statutory consultation to allow stakeholder input to the PRA.

3.1.7. Construction

Construction is scheduled to start slightly earlier in line with the improved Contract Award date. All other milestones are aligned with the Gate 2 submission.

The completion date is forecast to be Q1 2030 as at the Interim Update assured schedules.

3.2. Applicability to each SRO Option

The above changes that have been incorporated into the B.4 Schedule (the new Selected Option) are either directly linked to the decision to delay RAPID Gate 2, strategic in nature and would apply equally to the delivery strategy of each of the options identified or related to generic activities such as procurement that would apply equally to each of the solutions tabled. The underlying activities and logic are very similar for the pre-construction phase of each of SW's SRO solutions, and the changes highlighted for Option B.4 would have occurred for each of the SRO alternatives.

Accordingly, the highlighted differential between key milestones in July to October 2022 would be highly likely to be identical for each SRO option.

Importantly, the Deployable Output date has not changed for Option B.4 despite the evolution between IU and Gate 2. SW can be confident that the Deployable Output date for the SRO alternatives to Option B.4 would be the same as that articulated within the August 2021 assured schedules.

The Deployable Output Delivery Range previously articulated remains unaltered for each of the solutions.