



Method Statement: Options Appraisal

Consultation version

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Executive Summary

Water Resources South East (WRSE) is developing a multi-sector, regional resilience plan to secure water supplies for the South East until 2100.

We have prepared method statements setting out the processes and procedures we will follow when preparing all the technical elements for our regional resilience plan. We are consulting on these early in the plan preparation process to ensure that our methods are transparent and, as far as possible, reflect the views and requirements of customers and stakeholders.

This method statement covers the regional options appraisal and Figure ES1 illustrates how this will contribute to the preparation process for the regional resilience plan.

The aim of the regional options appraisal task is to bring together the separate company options appraisals into one integrated approach and to improve consistency across the company approaches.

This method statement sets out the process by which WRSE will appraise all the available options (demand and supply) for our regional resilience plan and includes an overview of the task, a detailed methodology and information relating to how we will progress the appraisal (inputs, outputs, key assumptions and milestones).

The options appraisal provides the evidence on which we will have to make decisions about which options to include in our regional resilience plan – and what investment will need to be included in company Water Resources Management Plans and business plans.

This method statement provides

- A clear explanation of the background, objectives and components of the options appraisal
- A high level outline is provided of how the regional level and WRMP level options assessments will inform each other so that they are based on common and consistent information and this is illustrated an overall process diagram (Figure ES.2)
- A clear description of the step by step process to be undertaken for the regional plan and the steps required to be undertaken by the water companies, and
- The option types being considered along with the option information being collated to enable the assessment of the options

This method statement will be finalised once the draft Water Resources Planning Guidance (dWRPG) is final at which time any further outstanding content and comments will be incorporated.

Figure ES1: Overview of the method statements and their role in the development of the WRSE regional resilience plan

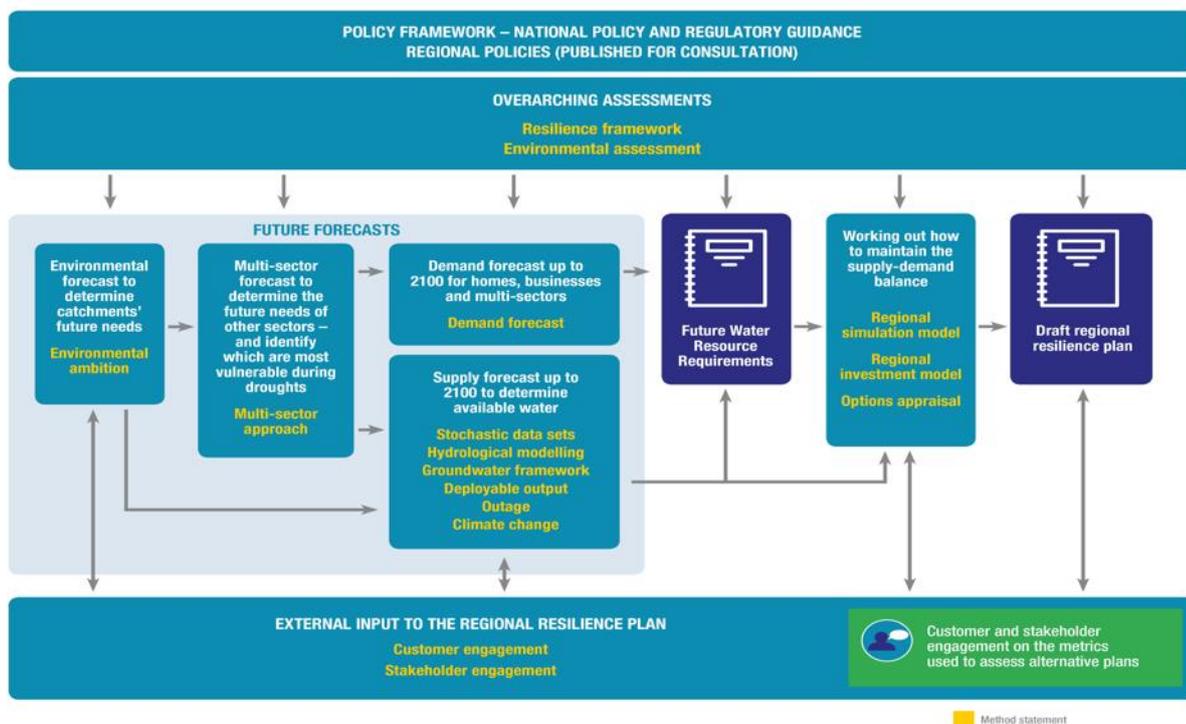
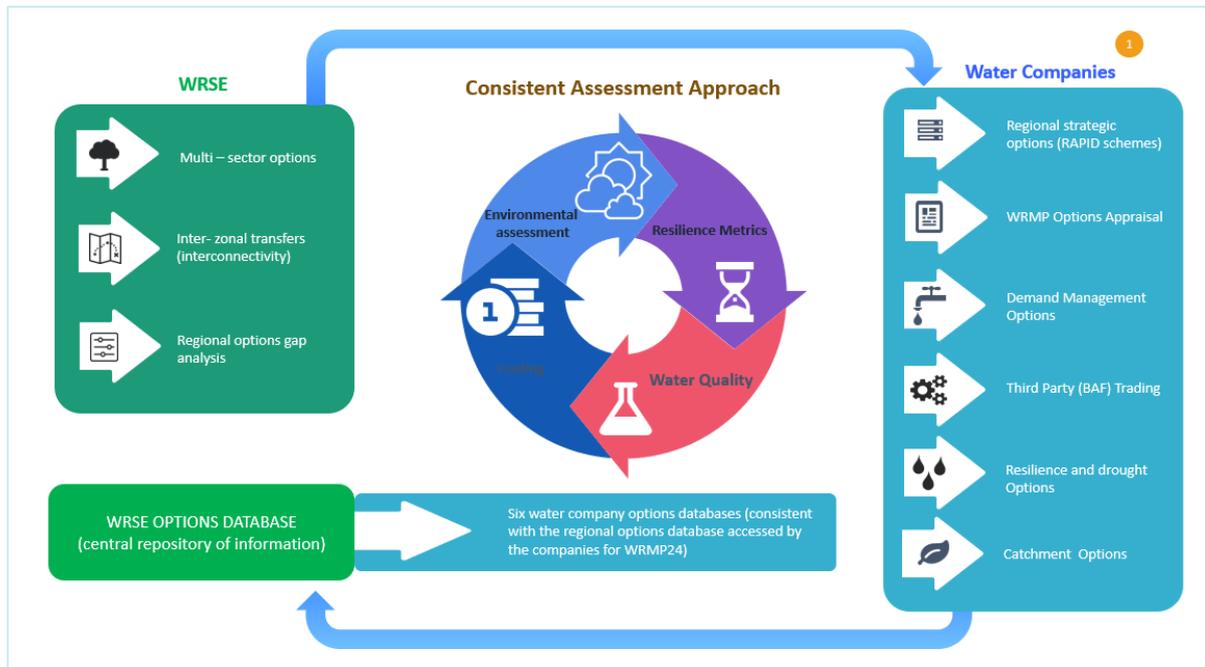


Figure ES.2 WRSE Integrated options appraisal methodology



1 Introduction

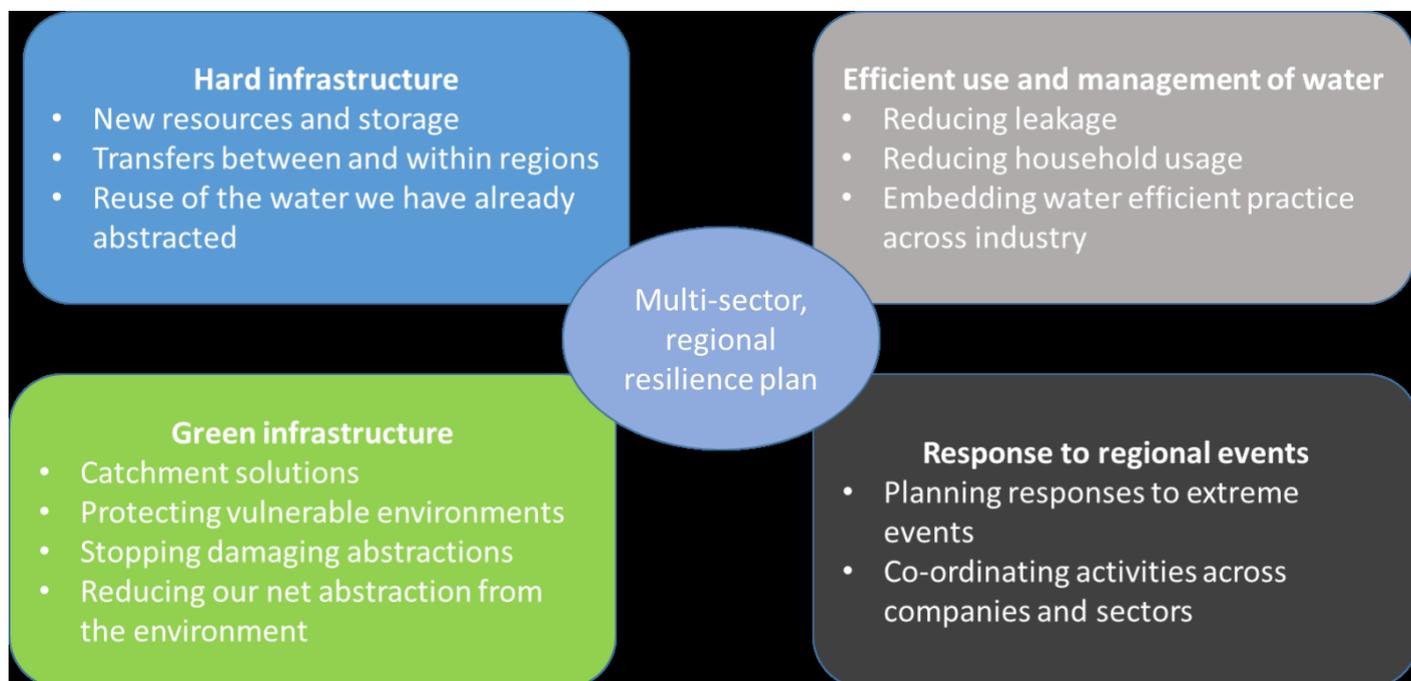
Overview

- 1.1 In February 2020 Water Resources South East (WRSE) published the initial regional [Statement of Resource Need](#), based on WRMP19. In February 2021 WRSE will publish an updated Statement of Resource Need based on any material interim updates to the supply demand balances. There will then follow, in August 2021, an initial draft regional plan, which will be based on the fully updated supply balances for the present planning round.
- 1.2 Ahead of the August 2021 draft regional plan submission our programme of work determines that a set of options will need to be identified to address the potential deficits. The following key dates have been set for the regional options appraisal:
 - Phase 1: Scoping phase for the invitation to tender for services
 - Phase 2: Options Appraisal (between Spring 2020 and March 2021)
 - Phase 3: Continuation tasks (post March 2021)
- 1.3 This method statement provides the information to show how as a region, WRSE has and will work collaboratively to undertake an appraisal of the available options. The option appraisal has been developed to meet best practice expectations and to be inclusive for stakeholders, whilst also being carried out in accordance with guidance published by the [National Framework for regional planning](#) (e.g for other sector demands) and the [WRPG](#) by the Environment Agency (2020).

Summary of outputs

- 1.4 The regional options appraisal workstream involves undertaking a regional option gap analysis to identify new regional options, collating a comprehensive set of existing options, improvements in consistency across option screening and design criteria and the development of new options where the potential is identified.
- 1.5 An appraisal of Public Water Supply (PWS) and non PWS supply options is being undertaken that will meet the challenges the region faces between 2025 and 2100, and also includes demand management options. Further, options that will deliver multiple benefits to people, the environment and industry will be developed. These include multi sector, catchment options and resilience options which are all shown in Figure 1 (Appendix 1 provides a full list of option types under consideration based on referenced guidance).

Figure 1. Summary of option types



- 1.6 **Appendix 2** provides a list of option information that is specified for each constrained feasible option that will be included within the regional options database. It includes details of constrained feasible list options for inclusion in investment modelling, as well as a list of rejected options together with the rejection rationale for each.
- 1.7 In addition to the option information in **Appendix 2** WRSE will be assessing the following for each option:
- Environmental information to support the SEA and environmental framework assessment, and
 - Resilience metrics in order to assess the resilience benefits for each option
- 1.8 This will ensure that the options are appraised as part of the decision-making phase of the regional plan development. These method statements are also available.

Roles and Responsibilities

- 1.9 Key roles and responsibilities are as follows:
- WRSE Technical Director: Meyrick Gough
 - Overall responsibility and accountability for the technical delivery of the WRSE programme

- WRSE Option Appraisal Manager/Lead: Nick Honeyball (WRSE PMB)
 - Overall responsibility and accountability for the technical delivery of the workstream
 - Overall responsibility for the budget proposal
- WRSE Option type leads: **Programme Management Board (PMB) Members**
 - Responsible for the scope and delivery of each of the sub-option workstream areas
- Consultants: Mott McDonalds
- Consultant Project Principle: Alice Mortimore
- Consultant Technical Principle: Bill Hume-Smith
- Consultant Work Package Lead: Rob McNicoll
- The WRSE options appraisal workstream governance structure contains a RACI (responsibility assignment matrix) structure and the consultants supporting the work have submitted a governance structure to WRSE PMB.
- The WRSE PMB hold responsibility and accountability for approving all technical works on behalf of WRSE according to the programme requirements and budget.
- Wider Programme Management:
 - Programme governance (Bex Carlisle)
 - Technical management (Sarah Jane Court)

Maintenance of Method Statement

1.10 Key updates to this method statement

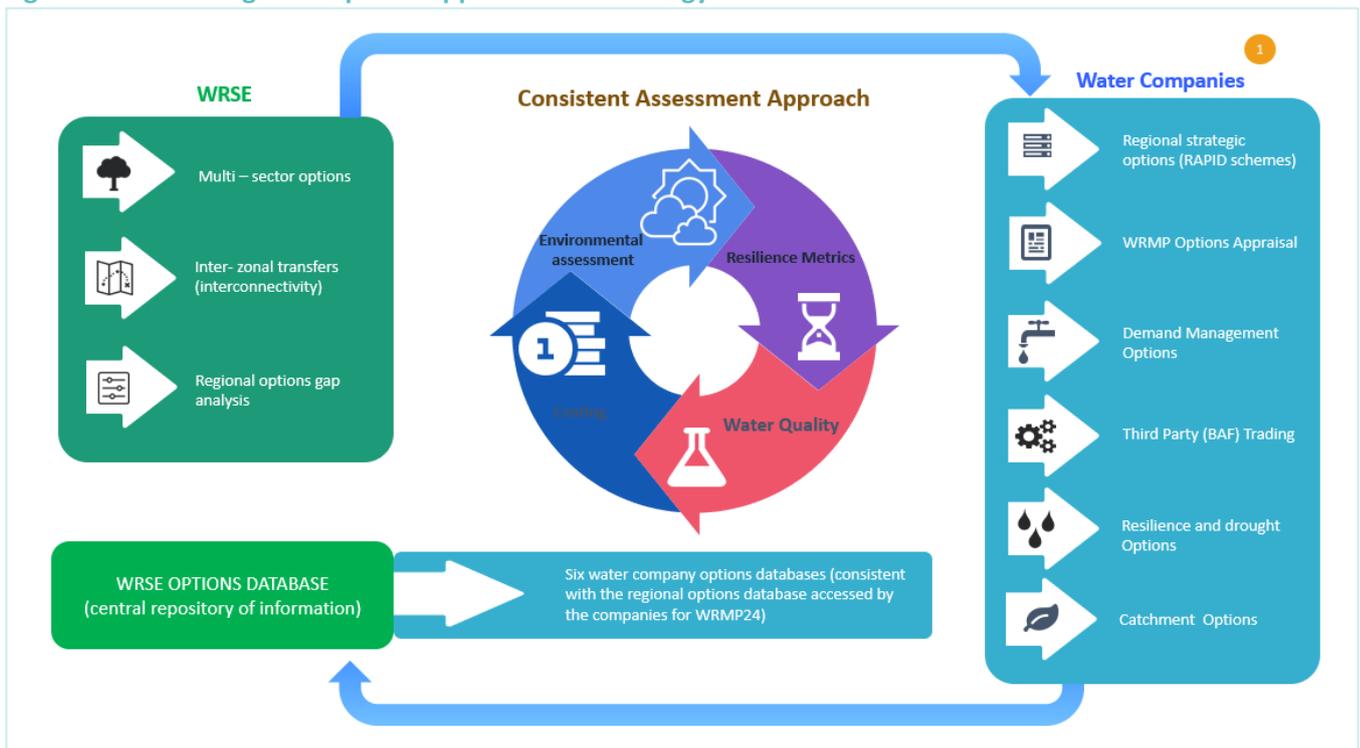
- 1st draft version June 2020
- 2nd draft version July 2020 (to publish online)
- Revised draft after consultation
- Iterative update/s 2021

2 Options Appraisal Methodology

An integrated approach to regional options appraisal

- 2.1 Figure 2 shows how the WRSE options appraisal is integrated with the water company WRMP appraisals, the wider programme requirements for environmental, resilience and water quality assessments. The methodology has been developed in this way to ensure improvements in consistency across the company approaches to ensure that material options are not overlooked and the inputs to the investment model are materially consistent. Furthermore, the outputs need to then be suitable for use in water company WRMPs.

Figure 2. WRSE Integrated options appraisal methodology

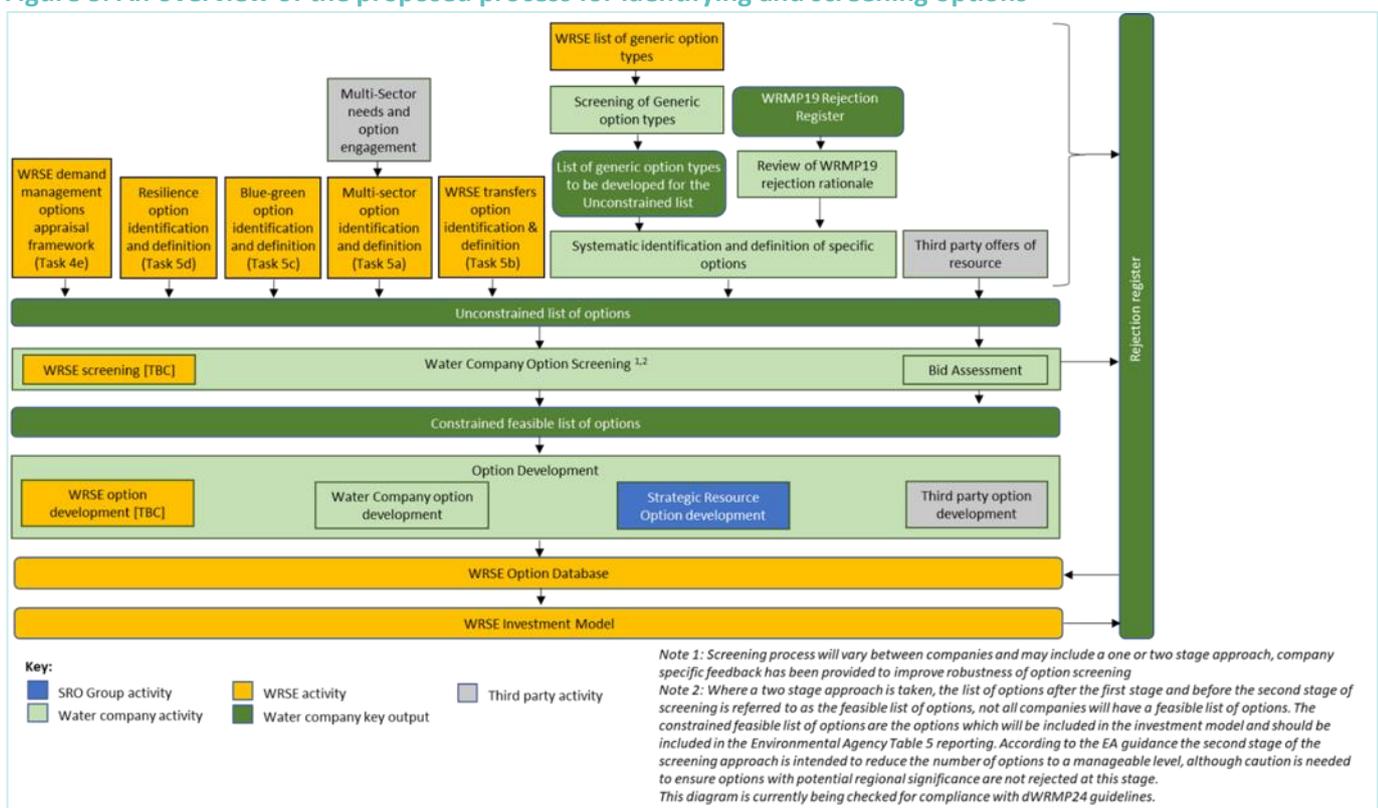


- 2.2 The options appraisal approach being undertaken by WRSE and the companies promotes integration between the regional and water company WRMP options appraisals, allowing both to actively inform the other.
- 2.3 A key component of the methodology has also been the work that some of the WRSE companies are involved in with RAPID (the Regulators' Alliance for Progressing Infrastructure Development) which includes Ofwat, the Environment Agency and Drinking Water Inspectorate (DWI). This work includes the

development activities for regional strategic options by companies, further explanation of how those options are being incorporated into the WRSE programme is provided in the Regional Strategic Options and the RAPID options (gap analysis) in paragraphs 2.20 to 2.23 below.

2.4 Figure 3 shows the stepped process for the option appraisal in this method statement and identifies what will be undertaken for the regional plan and what the water companies will need to do (with reference to the dWRMP24 guidelines).

Figure 3. An overview of the proposed process for identifying and screening options



2.5 WRSE have undertaken a sampled review of each company rejection registers to ascertain the basis for excluding options and is providing guidance on how to strengthen the rationale and audit trails in alignment with the dWRM24 guidance. The rejection registers will be updated accordingly by the companies to ensure that there is a robust rejection rationale. These will be recorded within the WRSE options database.

2.6 As part of the review of the company option screening work from WRMP19 WRSE is also reviewing the potential for new regional schemes that could be considered by more than one company. The relevant findings are being shared with the companies to enable the companies to assess whether these opportunities should be included within the constrained feasible list.

- 2.7 There are a number of ‘decision and hand-off points’ between the dWRMP24 and the regional level options appraisals, these start with acceptance of the screening recommendations by the companies and will include the following:
- Re-screened option lists by the companies inclusive of new regional options (constrained feasible lists)
 - Submission of the rejected options with rationale for rejection (unconstrained lists)
 - Option information upload to the regional database (option data)
 - An information share (as set out in Appendix 3 with the EA/NE) on stakeholder engagement
 - Iterative updates to the regional option database via option ‘windows’ for new information (3rd party options, updates to strategic regional options)
- 2.8 It should be noted that the dWRMP24 guidance is not final yet, so the work the companies will need to complete between now and when the guidance is finalised is subject to the finalisation of the guidance.

Demand side options

- 2.9 Demand management (DM) options go beyond traditional approaches of just volumetric savings to consider schemes associated with improving the environment and resilience. DM options can be divided into the following strategies, which may be sub-divided into household and non-household:
- Leakage reduction (distribution network and customer supply pipes)
 - Water efficiency (behaviour change and physical interventions at household level)
 - Metering (conversion from fixed rate to metered tariff, smart metering)
- 2.10 The degree to which the six companies could align is set up in Table 1, with five areas identified for assessment. The option with the least alignment is Option A, progressing up to that with the greatest alignment, Option E.

Table 1: Alignment on approach

Area	Option A	Option B	Option C	Option D	Option E
Tool					x
Framework				x	x
Assumptions			x	x	x
Assurance		x	x	x	x
Policy	x	x	x	x	x

2.11 For example, on planning assumptions the National Framework for Water Resources published by the Environment Agency in March 2020 set out the expected direction on leakage and household per capita consumption (PCC) in terms of the levels to be reached by 2050 in comparison to current figures. These are:

- Leakage - to be reduced by 50%
- PCC - 110 litres per person per day (a reduction of around 30-35%)

2.12 WRSE will be undertaking a consultation on these policy areas in August 2020.

2.13 We are trying to maximise alignment and consistency where possible and if practical to do so in the timeframe available, on that basis Option D appears to be the preferred and most practical to apply.

Supply side options

2.14 The regional option gap analysis will identify the potential for the development of new shared regional schemes and will incorporate individual company schemes. There will also be a check to see whether previously screened out options should be revisited or options that passed into the feasible lists should be re-screened. Recommendations on screening consistency will be provided to the companies, with companies carrying out re-screening tasks and passing the information back to WRSE.

2.15 WRSE have not applied a minimum size threshold to filter the supply options because even smaller local options can be important to meeting demands when aggregated, though schemes of less than 1Ml/d are usually not meaningful at regional scale. The current constrained feasible list of options held centrally at

regional level includes 159 options¹ that translates as 3,264 ML/d DYAA and 3,305 ML/d DYCP volumetric deployable output (WRSE, Initial Resource Position Statement 2020).

- 2.16 An important aspect of the WRSE work is to explore opportunities for improvements across the region in inter-connectivity between water resource zones (both within water companies and between water companies). The work WRSE are progressing with will be supported by supply demand balance modelling where opportunities to identify 'trapped' surplus and sub regional areas of demand are being identified to see whether new transfers could be developed that had previously not been identified through water company WRMPs.
- 2.17 In order to develop work with other sectors, WRSE have identified the need to set up a strategic working group with the following sectors, agriculture (NFU, West Sussex Growers, Kent soft fruit), energy producers, paper and pulp producers, aggregate industry and golf (Golf Course Managers Association). The group will assess the sector demands and work with the options team to ensure where options do emerge they can be translated into the options appraisal process.
- 2.18 Another key alternative option type are catchment options and the scope for catchment options is focusing on a) the incorporation of existing catchment options and b) undertaking catchment workshops to facilitate the identification of new catchment option ideas. The catchment workshops are being carried out in 2020 with catchment partnerships and will include a focus on catchment solutions.
- 2.19 The principles we will follow when sharing information with the Environment Agency and Natural England are set out in Appendix 3, and we will seek to undertake this at an optimal time to reduce the burden on all parties involved.

Regional Strategic Options and the RAPID options (gap analysis)

- 2.20 Three of the WRSE companies (Affinity, Thames and Southern Water) are working with other companies in neighbouring regions to further develop large scale options within the context of the RAPID process. These schemes are being assessed by the companies who are working with RAPID to a 'gated process'.
- 2.21 RAPID are also undertaking a 'gap analysis' of opportunities for increasing availability and sharing of water resources for resilience that may a) have been discounted in previous WRMPs, b) be in the national and regional interest and not previously considered (including multi sector options) and c) may be in the interest of future WRMPs.
- 2.22 WRSE is not directly undertaking the work for these companies, however it is working closely with the companies involved in this process in the following ways:

¹ excluding size variants, mutually exclusive option and drought options, but including catchment management

- By supporting these companies with a good understanding of the regional programme requirements (option information and timing) – for the inputs to the regional planning process
- By providing these companies with expectations and methods for consistency of approaches – for use in the options assessment work
- By working with RAPID where required and understanding the requirements to integrate the work emerging in a timely way into the regional planning options assessment – such as the gap analysis of the current strategic infrastructure schemes
- By undertaking regional needs assessment modelling (to support the gated process requirements) – as inputs to the RAPID gated process

2.23 This work is necessary to maintain the timely sharing of consistent information and data for the regional plan development, which will read through into statutory WRMPs which in turn will become the needs assessment for future statutory planning enquiries.

Resilience and drought options

2.24 Unlike previous WRMP options appraisals ‘resilience options’ have not usually been incorporated within the options appraisals, though drought options were incorporated by water companies at WRMP19. Due to the focus on resilience and the development of the resilience framework, WRSE are requesting that the water companies collate and submit their resilience and drought options for regional appraisal (these include options that do not offer deployable output benefit but can operationally support resilience during outage events such as loss of assets).

Water trading options

2.25 WRSE recognise that the water companies are also working separately with third parties on demand and supply option opportunities through their Bid Assessment Frameworks and that this work may trigger the development of new options (both supply and demand). It is proposed that water companies can include such options via ‘windows’ during the plan development, where companies can put forward water trading options that may have come forth through this process. By doing so there will be ample opportunity to include water trading innovation in options at regional scale where these may arise. As well as seeking offers of resource WRSE is conducting a systematic analysis to identify potential new bulk transfers that may be beneficial within the WRSE area.

3 Progressing the options appraisal

Inputs/Requirements

- 3.1 Regional level (consistency)
- Cross company methods (screening and option development)
 - Design and information (consistency method/s)
- 3.2 WRMP level (option lists)
- WRMP19 options
 - Resilience options
 - Catchment options
- 3.3 RAPID (National and regional option gap analysis)
- Findings and implications for WRSE from the RAPID (Ofwat) 'Meeting regional and national water resources needs: gap analysis of the current strategic infrastructure scheme portfolio' (draft June, 2020)
- 3.4 Other sector
- National Framework regional sector demand (EA)
 - Existing options (and new options at initial concept level (multi sector group))

Outputs

- 3.5 Outputs will include:
- A central regional options database that contains consistent information with company WRMPs (options, lists and information) available for water company WRMP sub lists and databases
 - A comprehensive list of options that cover a wide range of generic option types (following the best practice guidance)

- Regional options appraisal reporting to support water company WRMP24 options appraisal studies (to ensure consistency across the approaches and a gap analysis of regional scale options). These will include the following two reports:
 - The Task 1 and 2a Technical Note (Review of rejection registers, gap analysis and screening)
 - The Task 2b Technical Note (inclusive of Task4 consistency and design principles)
- Initial options appraisal 'pre consultation' stage communication with statutory stakeholders (EA/NE) to support WRMP pre consultation

3.6 A further breakdown of output contents will be provided in the updated version of this method statement in 2021.

Data definition and assurance

- 3.7 Additional clarification on information for input for the regional modelling will be provided where necessary to those parties that will be tasked with submitting the information e.g. the companies are being shown how to fill in the options templates and there is a guidance note on how to assess the resilience metrics for each option.
- 3.8 There are two level of technical assurance on information for input to the regional modelling, which will provide a record of how the data sources have been checked and recorded, these are as follows:
- Water company level (Level 1): Where the water company assurance process for dWRMP24 and where consultant supplier assurance processes are undertaken and recorded up to the point at which the data and information is submitted to WRSE.
 - WRSE regional level (Level 2): From the hand-over point where data is received by WRSE, the WRSE assurance process will be undertaken at regional level for all centralised data and information activities. Where there are further iterations and updates for option information between the companies and WRSE, the same two levels of assurance will need to be applied.
- 3.9 Where there is a need for targeted assurance for consistency to meet stakeholder expectations, such as application of the cost consistency methodology by companies, these will be defined as required to meet the assurance needs.

Key milestones

3.10 Key milestones are:

- September / October 2020: Initial option data upload to the WRSE option database (which will be phased during the autumn of 2020)
- December 2020: Close of first 'window' for new option information
- January to March 2021: Regional modelling in progress
- January to February 2022: Second 'window' for new option information
- March to April 2023: Following the update on WRMPs, a third limited opportunity to include option information changes

4 Summary

- 4.1 This method statement provides a clear explanation of the background, objectives and components of the options appraisal.
- 4.2 A high level outline is provided of how the regional level and WRMP level options assessments will inform each other so that they are based on common and consistent information and this is illustrated an overall process diagram.
- 4.3 The provides a clear description of the step by step process to be undertaken for the regional plan and the steps required to be undertaken by the water companies. Appendix 1 on the option types includes the dWRMP24 options assessment process (from Section 8) and alignment with this for the regional plan is indicated.
- 4.4 The iterative nature of finalising the method statement with respect of when the draft guidance is finalised is outlined as part of the options appraisal process will need to be undertaken by the water companies following the dWRMP guidelines submission.
- 4.5 The handover points between WRSE and the companies is included, along with the schedule of dates for when these activities will occur (key milestones).
- 4.6 The list of information required for the options appraisal and subsequent modelling is provided in Appendix 2 and where cross referencing to other workstreams is required it is provided (e.g. information provision for resilience and environmental assessments).
- 4.7 The quality assurance and key assumptions are outlined, and where further information may be required in time (such as the identification of uncertainty and confidence grades) we will provide this information in the final version of this document

5 Next Steps

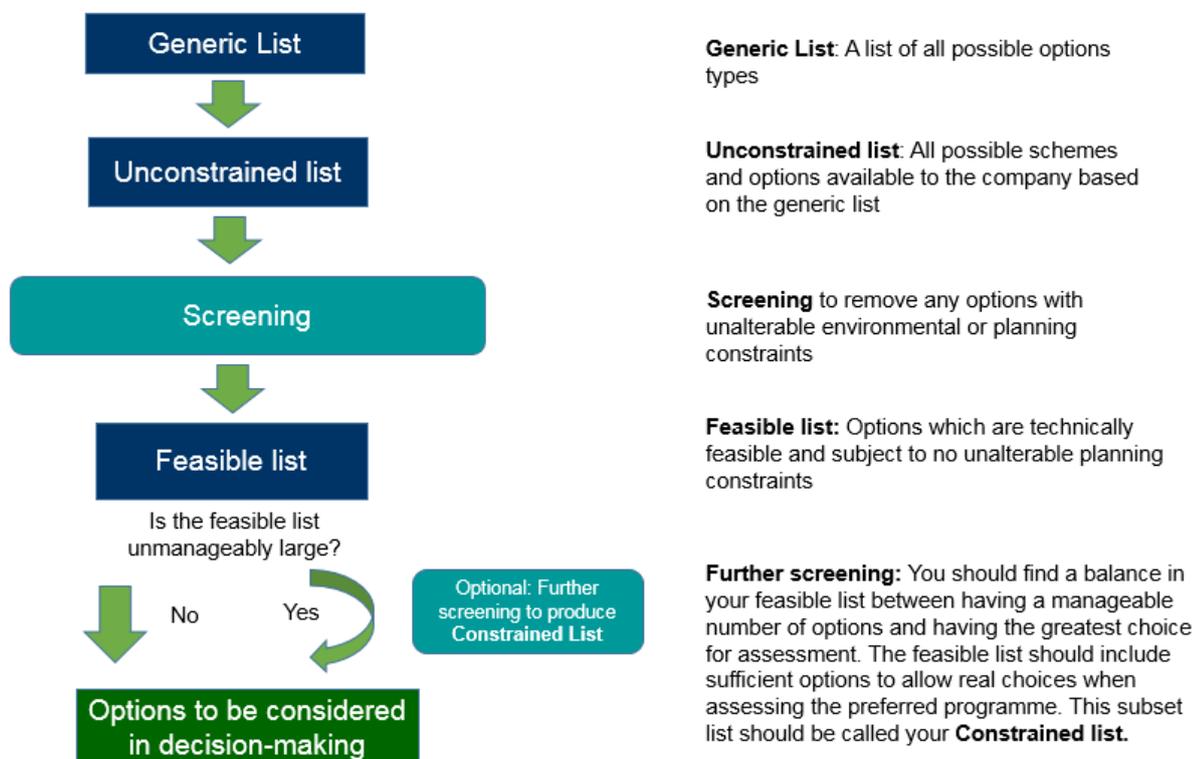
- 5.1 We are consulting on this method statement from 1st August 2020 to 30th October 2020. Details of how you can make comments can be found here [consultation website](#)
- 5.2 We will take into account the comments we receive during this consultation process, in updating the Method Statement. Alongside this, the Environment Agency will shortly be publishing its Water Resource Planning Guidelines (WRPG) on the preparation of regional resilience plans. We may need to update parts of our method statements in response to the WRPG. We have included a checklist in Appendix 4 of this method statement which we will use to check that our proposed methods are in line with guidance where applicable.
- 5.3 If any other relevant guidance notes or policies are issued then we will review the relevant method statement(s) and see if they need to be updated. As noted above, there may be other factors that will require us to update this Method Statement.
- 5.4 When we have finalised our Method Statement, we will ensure that we explain any changes we have made and publish an updated Method Statement on our website.

Appendix 1: Option Types (EA dWRPG 24, 2020; UKWIR, 2012)

The screening approach and the list of option types

Note: The screening and refining of the options is aligned with dWRMP2024 Guidance (EA, 2020) and UKWIR 2012. UKWIR Water Resource Planning Tools 2012 (Report Ref. No12/WR/27/6) Economics of Balancing Supply and Demand. UKWIR 2012 provides the expanded list which companies are using for alignment across WRMP options appraisals (not provided here).

1.1 Best practice for refining and screening options (incorporated within WRSE and Phase 1 review of consistency across company WRMPs, WRSE are promoting consistency using the same approach to options appraisal stages) taken from EA dWRPG 2024 (Section 8).



1.2 UKWIR 2012 (Tables 2 to 5 Generic Option Types expanded List) WRSE companies are following this guidance to support their options appraisals and WRSE are referencing this as best practice across the companies in the South East to promote consistency.

Table 2 Indicative SDB Customer Side Management Options

	Scheme Type	Sub-Categories/Sub-Components
1	Compulsory metering	Industrial premises, Commercial and public sector premises, Swimming pool owners, Sprinkler/hose pipe users, Households with an outside tap, Households in water-stressed areas, Households where a meter or meter box already exists

	Scheme Type	Sub-Categories/Sub-Components
2	Enhanced metering, Smart metering	Targeted installation of water meters and a promotional campaign to increase optant rates and change of occupancy switchers
3	Meter Installation policy	Installation when premises change ownership, Industrial, Commercial and public sector, Households
4	Metering of sewerage flow (to manage water consumption and water wastage)	Optional scheme, Compulsory scheme
5	Introduction of special fees	Introduction of separate additional fees for:, sprinkler users, hose pipe users, outside tap users, swimming pools
6	Changes to existing measured tariffs	Discontinued declining block rate tariffs, increasing the volumetric charges, introducing rising block volumetric charges, introducing summer/winter or other seasonal tariffs, introducing daily/peak/off-peak tariffs for at least some seasons, charge only above a defined subsistence level of use (to protect low income families), flow restrictor charging (tariff reduction for a restriction in domestic supply water pressure), domestic user tariffs and/or commercial user tariffs
7	Introduction of special tariffs for specific users	Introducing interruptible industrial supplies, Introducing lower charges for major users with significant storage, Introducing higher cost ban-free sprinkler or hose pipe licences, Introducing spot pricing for selected customers
8	Water use audit and inspection (and identification of household and non-household water efficiency opportunities)	Domestic property water use audit and retrofit, stand alone, Domestic property water use - audit and retrofit, Integrated Demand Management, Domestic property water use - self audit packs, Commercial property water use - audit integrated with Water Regulations Inspection, Commercial property water use audit, Institutional property water use audit and retrofit
9	Targeted water conservation information (advice on appliance water usage)	Industrial customers/bodies, Commercial customers, Households, Public sector (e.g. schools, hospitals, community groups), Recreation facilities (parks and gardens, golf courses), Designers of hot water systems, taps and water using appliances, Purchasers of water-using appliances (i.e. in showrooms), Labelling water consumption of appliances
10	Advice and Information on direct abstraction and irrigation techniques	Drip vs. spray irrigation, Direct abstraction, Other techniques for reducing evaporation

	Scheme Type	Sub-Categories/Sub-Components
11	Advice and information on leakage detection and fixing techniques	Industrial, Commercial and public sector, Household, Agricultural
12	Promotion of water saving devices	Appliance exchange programmes - washing machine, dishwasher, water closets or WCs Company subsidy to appliance manufacturers, Company subsidy to consumers for the purchase of water saving appliances Encouraging or requiring greater use of water saving technology in new and/or existing buildings (industrial, commercial, public sector and household) - fitting of showers, low volume shower heads, limited purchase/use of power showers, low flush toilets, dual flush toilets, fitting new toilets, composting toilets, waterless urinals, retrofitting existing toilets, shallow trap toilets, flush controller for urinals, timing devices, 'people detectors', self closing taps (i.e. push operation taps that cut off this supply after a short time, spray taps, toilet bag cistern dams (by displacing part of the cistern volume, reduce the flush volume), hose activated by a spring loaded trigger mechanism, limited purchase/use of instantaneous water heaters/boilers, research and development into water saving technology
13	Water Recycling	Encouraging or requiring water recycling (i.e. direct use of untreated 'grey water') - industrial, commercial and public sector, households (e.g. using water from baths/showers/basin for toilet use), fitting recycling systems in new houses, fitting recycling systems to existing houses
14	Water efficiency enabling activities	Sponsoring 'waste minimisation' projects, Tradable delivery entitlements, Water butts, Targeting gardeners for rainwater harvesting, Programme of re-washing customers' taps, Lobbying for tighter or company-specific water regulations, Improving the enforcement of water regulations, Implement water efficiency research (Waterwise) outcomes, Planning restrictions preventing new development
15	Change in Level of Service to enhance water available for use (WAFU)	

Table 3 Indicative SDB Distribution Side Management Options

	Scheme Type	Sub-Categories/Sub-Components
1	Customer supply pipe leakage reduction	Identification of major supply pipe leaks, fixing major supply pipe leaks, at water company expense, at customers' expense
2	Leakage reduction	Fixing of reported leaks, find and fix leakage in: trunk mains, distribution mains, communication pipes, reservoir overflows
3	Active leakage control (ALC)	Increase in leakage detection and repair resources beyond the short-term sustainable economic level of leakage (SELL)
4	Leak detection	Telemetry, district metering
5	Pressure reduction programmes (installation of pressure reducing valves)	
6	Advanced replacement of infrastructure for leakage reasons	
7	Distribution capacity expansion	Trunk mains, Distribution mains

Table 4 Indicative SDB Production Side Management Options

	Scheme Type	Sub-Categories/Sub-Components
1	Diagnostic studies	
2	Improved leakage detection and reduction on raw water mains	
3	Increase water treatment works (WTW) efficiency	Reduce treatment works losses
4	Washwater reuse - recycling of WTW process waste water discharges	On site washwater recovery

Table 5 Indicative SDB Resource Management Options

	Scheme Type	Sub-Categories/Sub-Components
1	Direct river abstraction	New river abstraction (with intake) and with licence application, Transfer of existing river licence to new or existing works, Modify existing abstraction licences
2	New reservoir	On-stream reservoirs, Pumped-storage reservoirs, Flood storage reservoirs, River regulation reservoirs and/or direct supply reservoir, Development of dis-used gravel pits (or redundant quarries) as reservoirs, Dam raising

	Scheme Type	Sub-Categories/Sub-Components
3	Groundwater sources	New sources, Improve existing sources, Increase aquifer yield by reducing seawater intrusion into aquifers, by pumping or through introduction of a physical barrier
4	Infiltration galleries	
5	Artificial Storage and Recovery wells (or Aquifer Storage and Recovery (ASR))	
6	Aquifer recharge /Artificial recharge (AR)	
7	Desalination	Membrane separation (electrodialysis reversal, reverse osmosis), Thermal processes (multi stage flash distillation, multiple effect distillation, mechanical vapour compression)
8	Bulk transfers of raw or treated water (including transfers from sources inside and outside of the company's own supply area)	Renovation or increase of existing transfer or development of new bulk transfers by canal, river or pipeline
9	Tankering of water	
10	Redevelopment of existing resources with increased yields	Changes to current system operation that may result in relatively cheap and simple operational changes that could yield benefits to the supply-demand balance
11	Re-use of existing private supplies (Defence establishment sites/Industrial sites) taken out of service	
12	Reclaimed water, water re-use, effluent re-use	Reclaimed domestic wastewater, Reclaimed industrial and commercial wastewater (for domestic, commercial and industrial users), Encouraging or requiring indirect waste water re-use (i.e. abstraction downstream from the discharge of treated waste water e.g. for agricultural irrigation and industrial cooling), Encouraging or requiring direct waste water re-use (i.e. reuse of treated waste water via pipes or other transfer infrastructure)
13	Imports (icebergs)	Towing of icebergs from the Norwegian sea
14	Rain cloud seeding	
15	Tidal barrage	
16	Rainwater harvesting	Direct collection and storage of rainwater
17	Abstraction licence trading	
18	Water quality schemes that may have the coincidental effect of increasing the deployable output (DO) of a sourceworks	
19	Catchment management schemes that promotes increase yield of sources	
20	Conjunctive use operation of sources	

	Scheme Type	Sub-Categories/Sub-Components
21	Joint (“shared asset”) resource	
22	Asset Transfers	
23	Options to trade other (infrastructure) assets	

1.3 Comparison of WRSE list An initial generic option list is proposed as follows, developed from the UKWIR Water Resources Planning Tools 2012 Report, but categorised according to the WRSE high level option types. Some additional Scheme Types and Sub Types have been added. Text in italics is carried forward from the UKWIR generic option type tables and the ‘UKWIR Ref’ indicates the table number and scheme type number from the UKWIR tables. These option types are under review by the companies and are subject to change (numbering relates to internal reporting).

Table 5.1: Blue – Green Infrastructure Generic Option Types

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type
Catchment management	5.19	<i>Catchment management schemes</i> - Supporting river flows
Catchment management	5.19	<i>Catchment management schemes</i> - Habitat creation on chalk aquifers
Catchment management	5.19	<i>Catchment management schemes</i> - Flood Storage / Wetland creation
Catchment management	5.19	<i>Catchment management schemes</i> - Reconsider existing fish practices
Catchment management	5.19	<i>Catchment management schemes</i> - River Restoration
Catchment management	5.19	<i>Catchment management schemes</i> - Using SuDs to replenish aquifers
Catchment management	5.19	<i>Catchment management schemes</i> - Nitrate reduction
Catchment management	5.19	<i>Catchment management schemes</i> - Pesticide reduction
Catchment management	5.19	<i>Catchment management schemes</i> - Payments for ecosystem services
Catchment management	5.19	<i>Catchment management schemes</i> - Agricultural Activity
Other	5.18	<i>Water quality schemes that may have the coincidental effect of increasing the deployable output (DO) of a source works</i>

Table 5.2: Efficient Use and Management of Water Generic Option Types

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description
Consumption reduction	2.1	<i>Compulsory metering - Household</i>	<i>Households in water-stressed areas, Households where a meter or meter box already exists</i>
Consumption reduction	2.1	<i>Compulsory metering - Selective</i>	<i>Customers with swimming pool, outside taps, sprinkler/hose pipe users</i>
Consumption reduction	2.1	<i>Compulsory metering - Non-household</i>	<i>Industrial premises, Commercial and public sector premises</i>
Consumption reduction	2.10	<i>Advice and Information on direct abstraction and irrigation techniques</i>	<i>Drip vs. spray irrigation, Direct abstraction, Other techniques for reducing evaporation</i>
Consumption reduction	2.11	<i>Advice and information on leakage detection and fixing techniques</i>	<i>Industrial, Commercial and public sector, Household, Agricultural</i>
Consumption reduction	2.12	<i>Promotion of water saving devices - Retrofitting (new or subsidised)</i>	<i>Replacement of existing fittings (e.g. taps, toilets) in existing housing stock. Appliance exchange programmes - washing machine, dishwasher, water closets or WCs. Company subsidy to appliance manufacturers. Company subsidy to consumers for the purchase of water saving appliances. Limited purchase/use of instantaneous water heaters/boilers. Installation of low volume shower heads, toilet bag cistern dams, water butts, flush controller for urinals etc.</i>
Consumption reduction	2.13	<i>Water Recycling - grey water reuse (existing household and non-household)</i>	<i>Encouraging or requiring water recycling (i.e. direct use of untreated 'grey water') - industrial, commercial and public sector, households (e.g. using water from baths/showers/basin for toilet use),, fitting recycling systems to existing houses</i>
Consumption reduction	2.13	<i>Water Recycling - grey water reuse (new household and non-household)</i>	<i>Encouraging or requiring water recycling (i.e. direct use of untreated 'grey water') - industrial, commercial and public sector, households (e.g. using water from baths/showers/basin for toilet use), fitting recycling systems in new houses.</i>
Consumption reduction	2.14	<i>Sponsoring Water efficiency enabling activities by others</i>	<i>Sponsoring 'waste minimisation' projects, Tradable delivery entitlements, Targeting gardeners for rainwater harvesting, Lobbying for tighter or company-specific water regulations, Improving the enforcement of water regulations, Implement water efficiency research (Waterwise) outcomes, Planning restrictions preventing new development</i>
Consumption reduction	2.2	<i>Enhanced metering - Household</i>	<i>Where meters are installed compulsorily but then customers encouraged to switch to paying measured charged voluntarily</i>
Consumption reduction	2.2	<i>Enhanced metering, AMI Smart metering - For all Customers</i>	<i>Targeted installation of water meters and a promotional campaign to increase optant rates and change of occupancy switchers</i>
Consumption reduction	2.3	<i>Meter Installation policy - Water Company Level</i>	<i>Installation when premises change ownership, Industrial, Commercial and public sector, Households</i>

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description
Consumption reduction	2.3	<i>Meter Installation policy - Regional / national level</i>	
Consumption reduction	2.4	<i>Metering of sewerage flow - To manage water consumption and water wastage</i>	<i>Optional scheme, Compulsory scheme</i>
Consumption reduction	2.5	<i>Introduction of special fees</i>	<i>Introduction of separate additional fees for, sprinkler users, hose pipe users, outside tap users, swimming pools</i>
Consumption reduction	2.6	<i>Changes to existing measured tariffs - Drought protection</i>	<i>Including - seasonal, spot pricing for water stressed areas, drought time tariffs, introducing summer/winter or other seasonal tariffs, introducing daily/peak/off-peak tariffs for at least some seasons,</i>
Consumption reduction	2.6	<i>Changes to existing measured tariffs - Volumetric charges</i>	<i>increasing the volumetric charges, introducing rising block volumetric charges, charge only above a defined subsistence level of use (to protect low income families), flow restrictor charging (tariff reduction for a restriction in domestic supply water pressure)</i>
Consumption reduction	2.6	<i>Changes to existing measured tariffs - Other</i>	<i>Discontinued declining block rate tariffs, domestic user tariffs and/or commercial user tariffs</i>
Consumption reduction	2.7	<i>Introduction of special tariffs for specific users</i>	<i>Introducing interruptible industrial supplies, introducing lower charges for major users with significant storage, introducing higher cost ban-free sprinkler or hose pipe licences, Introducing spot pricing for selected customers</i>
Consumption reduction	2.8	<i>Water use audit and inspection - Household and non-household water efficiency</i>	<i>Domestic property water use audit and retrofit, stand alone, Domestic property water use - audit and retrofit, Integrated Demand Management, Domestic property water use - self audit packs, Commercial property water use - audit integrated with Water Regulations Inspection, Commercial property water use audit, Institutional property water use audit and retrofit</i>
Consumption reduction	2.9	<i>Awareness campaigns - Targeted water conservation information (advice on appliance water usage)</i>	<i>Industrial customers/bodies, Commercial customers, Households, Public sector (e.g. schools, hospitals, community groups), Recreation facilities (parks and gardens, golf courses), Designers of hot water systems, taps and water using appliances, Purchasers of water-using appliances (i.e. in showrooms), Labelling water consumption of appliances.</i> <i>Customer education on water saving appliances. Encouraging greater use of water saving technology in new and/or existing buildings (industrial, commercial, public sector and household). Encouraging fitting of showers, low volume shower heads, limited purchase/use of power showers, low flush toilets, dual flush toilets, fitting new toilets, composting toilets, waterless urinals, retrofitting existing toilets, shallow trap toilets, flush controller for urinals, timing devices, 'people detectors', self-closing taps i.e. push operation taps that cut off this supply after a short time, spray taps, toilet bag cistern dams (by displacing part of the cistern volume, reduce the flush volume), hose activated by a spring loaded trigger mechanism, research and development into water saving technology.</i>
Consumption reduction	New	Home visits to reduce plumbing losses	Assistance in repairing leaking toilets. <i>Programme of re-washing customers' taps</i>
Consumption reduction	New	Reduction in other consumption	Reduction of distribution system operational use, reduction of legal water use that is unbilled & reduction in illegal water use

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description
Loss reduction	3.1	<i>Customer supply pipe leakage reduction</i>	<i>Identification of major supply pipe leaks, fixing major supply pipe leaks, at water company expense, at customers' expense or subsidised by water company</i>
Loss reduction	3.2	<i>Leakage reduction - trunk mains and service reservoir leakage reduction</i>	<i>Find & fix leakage in trunk mains and reservoirs including overflows</i>
Loss reduction	3.2	<i>Leakage reduction - Speed and quality of repairs</i>	Changes to policy / organisational setup e.g. fixing of reported and/or detected leaks Increase in repair resources Improved quality of repairs
Loss reduction	3.5	<i>Leakage reduction - Pressure reduction programmes</i>	New pressure reduction programmes (installation of PRVs) Optimisation of existing pressure management assets Pressure transient reduction
Loss reduction	3.6	<i>Leakage reduction - (Asset renewal)</i>	Additional leakage-driven mains replacement Small area networks <i>Distribution capacity expansion</i> to relieve constraints and manage pressure
Loss reduction	4.1	<i>Diagnostic studies for production losses</i>	
Loss reduction	4.2	<i>Improved leakage detection and reduction on raw water mains</i>	
Loss reduction	3.3, 3.4	<i>Leakage reduction - Active Leakage Control</i>	Changes to policy / organisational setup Increase in leakage detection resources Improved efficiency Innovative techniques and technologies e.g. fast logging, fixed noise logging, smart networks
Loss reduction	4.3, 4.4	<i>Increase water treatment works (WTW) efficiency</i>	<i>Reduce treatment works losses</i> <i>On site wash water recovery</i>
Loss reduction	New	<i>Leakage reduction - Customer engagement / education / incentives</i>	Advice and information on leak identification and fixing techniques to raise awareness and educate customers to report leaks
Loss reduction	New	<i>Leakage enabling schemes</i>	e.g. better monitoring and information including night use, investigation to better understand the network, identifying previously unknown consumption, improved meter accuracy and DMA operability, more bulk metering, raw water mains monitoring.
Other	5.16	<i>Rainwater harvesting</i>	<i>Direct collection and storage of rainwater.</i> May be at domestic or industrial scale (e.g. airports)
Other	New	<i>Sea water for industrial processes and cooling</i>	
Outage reduction	New	<i>Interventions to reduce outage risk</i>	Interventions to increase source and system reliability, redundancy, resistance, response and recovery to outage events enabling reduction in elements of outage risk, by changing magnitude, likelihood and duration of impacts.

Table 5.3: Hard Infrastructure Generic Option Types

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description
Desalination	5.7	<i>Desalination</i>	<i>Membrane separation (electrodialysis reversal, reverse osmosis), Thermal processes (multistage flash distillation, multiple effect distillation, mechanical vapour compression)</i>
Groundwater	5.3	<i>Groundwater sources</i>	<i>New sources, improve existing sources (with or without licence change), Increase aquifer yield by reducing seawater intrusion into aquifers, by pumping or through introduction of a physical barrier</i>
Groundwater	5.5	<i>Artificial Storage and Recovery wells (or Aquifer Storage and Recovery (ASR))</i>	
Groundwater	5.6	<i>Aquifer recharge /Artificial recharge (AR)</i>	
Other	5.15	<i>Tidal barrage</i>	
Other	5.20	<i>Conjunctive use operation of sources</i>	
Other	5.21	<i>Joint ("shared asset") resource</i>	
Other	5.22	<i>Asset Transfers</i>	
Other	5.23	<i>Options to trade other (infrastructure) assets</i>	
Other	5.12, 5.17	<i>Abstraction licence trading</i>	<i>Trading of existing licences. Re-use of existing private supplies taken out of service (Defence establishment sites/Industrial sites)</i>
Removal of constraints	3.7	<i>Distribution capacity expansion</i>	<i>Trunk mains, Distribution mains</i>
Removal of constraints	5.10	<i>Redevelopment of existing resources with increased yields</i>	<i>Changes to current system operation that may result in relatively cheap and simple operational changes that could yield benefits to the supply-demand balance</i>
Removal of constraints	New	<i>Increase water treatment works (WTW) capacity</i>	
Reservoir	5.2	<i>New reservoir</i>	<i>On-stream reservoirs, Pumped-storage reservoirs, Flood storage reservoirs, River regulation reservoirs and/or direct supply reservoir, Development of dis-used gravel pits (or redundant quarries) as reservoirs, Dam raising</i>
Reuse	5.12	<i>Reclaimed water, water re-use, effluent re-use</i>	<i>Include recycling of sewage, surface water, or wastewater treatment works final effluent for direct or indirect reuse.</i>
River abstraction	5.1, 5.4	<i>Direct river abstraction</i>	<i>New river abstraction (with intake) and with licence application, Transfer of existing river licence to new or existing works, modify existing abstraction licences. Also includes use of infiltration galleries.</i>
Import	5.8	<i>Bulk transfers into region</i>	<i>Import of raw or treated water from outside WRSE region. May include renovation or increase of existing transfer or development of new bulk transfers by canal, river or pipeline</i>
Transfers	5.8	<i>Bulk transfers within region</i>	<i>Transfer of raw or treated water between WRZ/companies within WRSE region: Renovation or increase of existing transfer or development of new bulk transfers by canal, river or pipeline</i>

Table 5.4: Response to Regional Events Generic Option Types

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description
Drought orders	New	Drought intervention - Drought order	Limitation of other abstractions, and further limit customer use of water
Drought permits	New	Drought intervention - Drought permit	Modification or suspension of conditions in abstraction licences
Other	2.15	<i>Change in Level of Service to enhance water available for use (WAFU)</i>	
Other	5.13	<i>Imports (icebergs)</i>	<i>Towing of icebergs from the Norwegian sea</i>
Other	5.14	<i>Rain cloud seeding</i>	
Other	New	Drought intervention - recommission abandoned sources	
Transfers	5.9	<i>Tankering of water</i> - Road Tankering	
Transfers	5.9	<i>Tankering of water</i> - Sea Tankering	
Transfers	New	Drought intervention - Temporary transfer	Transfers between WRZs under mutual aid using existing connections, new transfers, or emergency transfers constructed in drought circumstances

Appendix 2 Option Information (WRSE Data Template, 2020)

List of option information that is specified for each option

For each option the following information will be requested from the companies or developed by WRSE (where new options are created in WRSE). The data template is under development and some fields may change but provide an outline initial view of what data is under consideration and being tested by the companies.

2.1 Summary of option information

Data field	Brief description	Additional note
Option name / ID	Name and identification reference	Consistent with company reference (WRMP)
Option Description	A brief description of the option, including the engineering design	
Option stage and type	The option stage allows for real option analysis (e.g. planning, construction). Classification (e.g. reservoir, river abstraction, groundwater etc).	
WRMP19 Change	No change (the same option as at WRMP19). New option (this scheme is changed from WRMP19 or a new option entirely)	This will allow for filtering for stakeholder engagement (e.g. EA/NE)
Minimum flow and capacity (Ml/d)	Summary fields on the benefits of the option	
Cost base	The date for which all costs are current for, indexing will be applied to make all costs consistent	
Duration (years)	The estimate in years for which how long the option will take to deliver	
Earliest start date (year)	The earliest date the first phase of the project can start	
Location details	NGRs for locations of key start/end points (inclusive of donor/recipient company names if applicable)	
Rejection details	If scheme is rejected, the reason why/when	
Dependencies	Weather options are: <ul style="list-style-type: none"> • Mutually exclusive • Mutually inclusive 	

Data field	Brief description	Additional note
	<ul style="list-style-type: none"> Reliant of start/completion of another option 	

2.2 Option metric profiles 75 year (cost and other metrics)

Metric	Brief description	Additional note
Costs	<ul style="list-style-type: none"> Capital costs (capital expenditure, or 'capex') including renewal costs (and sub-metrics e.g. M&E) Optimism bias (using consistent cost method) and confidence grading Costed Risk Operating cost ('opex') Fixed / variable 	
Deployable Output (DO)	Yearly profile of DO against a number of scenarios: <ul style="list-style-type: none"> NYAA (normal year annual average) DYAA (dry year annual average) DYCP (dry year critical period) 1:200 drought 1:500 drought 	
Embodied and Operational Carbon	Carbon emissions (kg CO ₂ e) <ul style="list-style-type: none"> Fixed / variable 	
Other	Electricity <ul style="list-style-type: none"> Fixed / variable 	

2.3 Option non-profiled metric data (resilience, environmental and other metrics)

These metrics are single point values and do not vary over time and as such do not need to be profiled

Metric	Brief description	Additional note
Resilience	<ul style="list-style-type: none"> Supply Demand Benefit Uncertainty Vulnerability to other Hazards Frequency/Extent of Drought Effects Raw Water Quality Risks Capacity of Catchment Services Expected time to failure Duration of Enhanced Drought Restrictions 	A mixture of subjective 1-5 scores and objective metrics that will be converted to 1-5 scores

	<ul style="list-style-type: none"> • Availability of Flow Regulation • Operational Complexity • System Connectivity • Catchment Connectivity • Scalability & Modularity • Lead Time • Reliance on External bodies • Engagement of Catchment Resilience 	
Environmental	<ul style="list-style-type: none"> • SEA Environmental Benefit Effect • SEA Environmental Negative Effect • Biodiversity Net Gain • Natural Capital 	These metrics will be provided by the environmental workstream
Other		Other metrics may be added in the future

2.4 Resilience information (option level)

Additional information	Description	Further details
Embodied and Operational Carbon	Carbon emissions in terms of kg CO ₂ e	
Environmental and social considerations	Strategic Environmental Assessments (SEA) and Habitats Regulations Assessment (HRA) Potentially natural capital	
Wider benefits	Other benefits that could be factored into the overall assessment of the best long term adaptive plan	
Reporting tables	Any Regional plan table requirements	

Appendix 3 Stakeholder pre-consultation (EA/NE)

Principles and approach to sharing regional options appraisal information with the Environment Agency (EA) and Natural England (NE) teams

Content

- The need for engagement
- The engagement 'ask' from the WRSE options appraisal team
- The principles and proposed approach
- Timely release of information and initial timeframe

The reason for this appendix (the 'need')

The WRSE options appraisal workstream will require engagement with stakeholders as part of the task delivery. The Environment Agency (EA) and Natural England (NE) are key stakeholders for statutory water company WRMPs and therefore will need early visibility of the activities being undertaken by WRSE (which will inform company WRMP24 level options appraisals).

The type of information that could be part of the engagement include:

- Technical methods
 - Such as changes to the company WRMP screening methods and approaches through recommendations by WRSE to improve consistency across the company WRMP options appraisals
- Options information
 - Option lists (may change as a result of new information or recommendations made by WRSE)
 - Option scopes and new options may occur (either from WRSE or water company appraisals)

It is recognised that these changes should be managed and organised as efficiently as possible, and that by doing this through WRSE (initially), ahead of WRMP24 pre-consultations we may be able to control the impact on all parties (time and resourcing) and help mitigate the risk of subsequent EA/NE feedback on WRMPs requiring significant changes to the regional plan.

The engagement 'asks'

We would like to engage the EA/NE in these two key areas of our options appraisal work therefore and Table 1 provides an initial list of areas of engagement along with a summary of what feedback we would expect to receive.

Area of work	Method / Report / Information type	Feedback
Technical methodology	Phase 1 scoping report Phase 2 regional approach (options appraisal) <ul style="list-style-type: none"> • Approach to option screening • Approach to option development and consistent information requirements for the constrained feasible list Phase 3 WRSE options appraisal summary report	Does the approach to regional planning set out align with your expectations, including those of the WRP and National Framework? Do you have any comments on the environmental assessment methodology?
Options	Lists (option database) <ul style="list-style-type: none"> • Changes to unconstrained, feasible lists • The rationale for why and which options 	Are you satisfied with the application of the approach for options identification and screening? Are there options on the constrained feasible list that you think should not be included? Are you aware of any gaps in the constrained feasible list?
	Option level (information) <ul style="list-style-type: none"> • Existing option (with new environmental information) • New option creation (and environmental information) 	Do you have any comments on specific option information for investment modelling (e.g. environmental metrics, rejection reasonings)?

The principles we propose to follow to carry out the engagement

We recognise that the EA and NE have limited resources available to undertake the engagement, we also recognise that with the current situation (Covid-19) and restrictions in place that face to face contact is no possible. In order to undertake the engagement we are currently working on the following that will help to manage the engagement effectively.

- That because a single regional database is held, that is consistent with the company options list, that WRSE will be able to organise the initial sharing of information
- That the data information platforms will be developed in ways to help facilitate this (e.g. data fields which allow for the sorting of information)
- That we will agree beforehand on the information types and feedback required
- That we will provide the EA/NE with the information and clearly delineate where the feedback should be provided

- Agree with the EA/NE on a timeframe for the information share and feedback (we will agree beforehand a schedule)

Initial timeframe

Based on the current programme it is most likely that the bulk of the sharing of information relating to options will occur either in the Autumn of 2020 or Winter 2020/21.

The timing of the release would be best once the initial data uploading and options appraisal screening stages have been undertaken, along with any activities that could create new options. That way much of the work that will be ongoing for the remainder of 2020 will have been undertaken and that will reduce the potential for releasing information that is subject to change (much of the workstream will have stabilised at that point).

In terms of technical methods, the Phase 1 and Phase 2 reports are available for review by the EA/NE now (though it should be noted that the Phase 2 scope has subsequently been developed further), and the initial tasks on consistency and screening approaches should be available Summer / Autumn (subject to confirmation). These could be passed to the EA/NE representatives on the WRSE PMB when available subject to agreement.

Appendix 4 Checklist of consistency with the Environment Agency WRMP24 Checklist

The Environment Agency published its WRPG on XXXXXX 2020, including the WRMP24 Checklist. The following table identifies the relevant parts of the checklist relating to this Method Statement, and provides WRSE’s assessment of its consistency with the requirements in the Checklist.

No.	Action or approach	Method Statement ref:	WRSE assessment of consistency