

8:Supply-Side Option Development



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8 Supply-Side option development

Document purpose:

This chapter sets out our approach for developing and selecting the supply-side options. It builds on our supply forecast and water resources strategy to identify the potential, feasible options that will go forward for final assessment to build our Plan. We list our unconstrained, feasible and constrained options and comment on our approach, selection and decision-making.

Summary:

We have undertaken a comprehensive process to identify and then define feasible supply-side options.

The option brainstorming stage identified several option types which were discounted because no known opportunities have yet been identified. Other option types were discounted due to the perceived high socio-economic, environmental or technical feasibility. A summary of some of the option types discounted, which may eventually become feasible are:

- Abstraction licence trading
- Water quality schemes that may also increase the deployable output of source works
- Options for storing water (surface water/stormwater runoff, gravel pits)
- Collection of water from large solar farms
- Using saline water for potable or non-potable use

We then developed 157 unconstrained options, a number of these are pending the conclusion of further environmental studies or engineering development to confirm their feasibility. Some of these schemes are being revisited as part of our response to drought 2022. These include various pumped storage schemes, raising various dams, quarry storage schemes, changes to compensation flows or changes to seasonal or daily licences. These may become feasible in the longer term and therefore form the basis for options in our revised draft plan for WRMP24 or in WRMP29.

The 157 unconstrained options identified were reduced to 40 feasible options, 33 options in Colliford, Roadford, and Wimbleball water resource zones, and 7 options in Bournemouth water resource zone.

These feasible options have then undergone further feasibility and investigations, assessing environmental, biodiversity and natural capital impacts and benefits, greenhouse gas emissions, availability of water, engineering scope and feasibility to inform a whole life-cycle cost for each scheme. These feasible options were used as an input into our decision-making process described in Chapter 10, to inform our recommended best-value adaptive plan.

In summary:

- Further engineering and environmental studies on our supply options will be completed to inform our revised draft WRMP24.
- Also, through our learning from drought 2022 and through other ongoing studies and engagement with stakeholders we are continuing to look at further feasible options for inclusion in our plan.

1 Our approach

1.1 Overview

Our approach expands on the WRMP19 submission with reference to the water resource planning guideline (section 8)¹ and has been presented in a flow diagram below (see figure 1).

Our process is comprised of two phases:

- Option Identification phase:** This phase, centred on the formulation of an exhaustive list of unconstrained supply options, derived by our internal subject matter experts and all options considered at WRMP19, is followed by a comprehensive option screening process against set criteria to develop a draft list of feasible options. This set of options is further screened for prohibitive environmental factors resulting in a feasible options list.² The list of feasible supply options is then progressed to the option definition phase.
- Option Definition Phase:** Using internal/ external asset management and engineering expertise, each feasible option is drafted into a technical scope document (engineering scope v1)³ and distributed to the framework engineering consultancies for further development. An additional stakeholder engagement activity then occurs, assessing the new technical document (engineering scope v2) against any subsequent supply/demand changes. A refined feasible option list is produced and signed off by key stakeholders. This list is then reissued to framework engineering consultancies to produce a final technical document (engineering scope V3) that will inform the non-technical executive summaries and completion of WRMP tables 4, 5, and 5a-c, used for adaptive planning.

The supply-side options are combined with those developed for the demand-side, along with the options identified for making efficiencies at the ‘unconstrained’ stage. This master list is considered as a whole and developed until there is a complete list of feasible supply, demand and efficiency options ready for plan development. The feasible supply and demand-side options are taken forward for further planning, scenario development, and economic analysis to develop our overall best value plan and list of constrained options. This later stage of the process is described in Chapter 10: Plan Development.

The final outputs in figure 1 are listed below

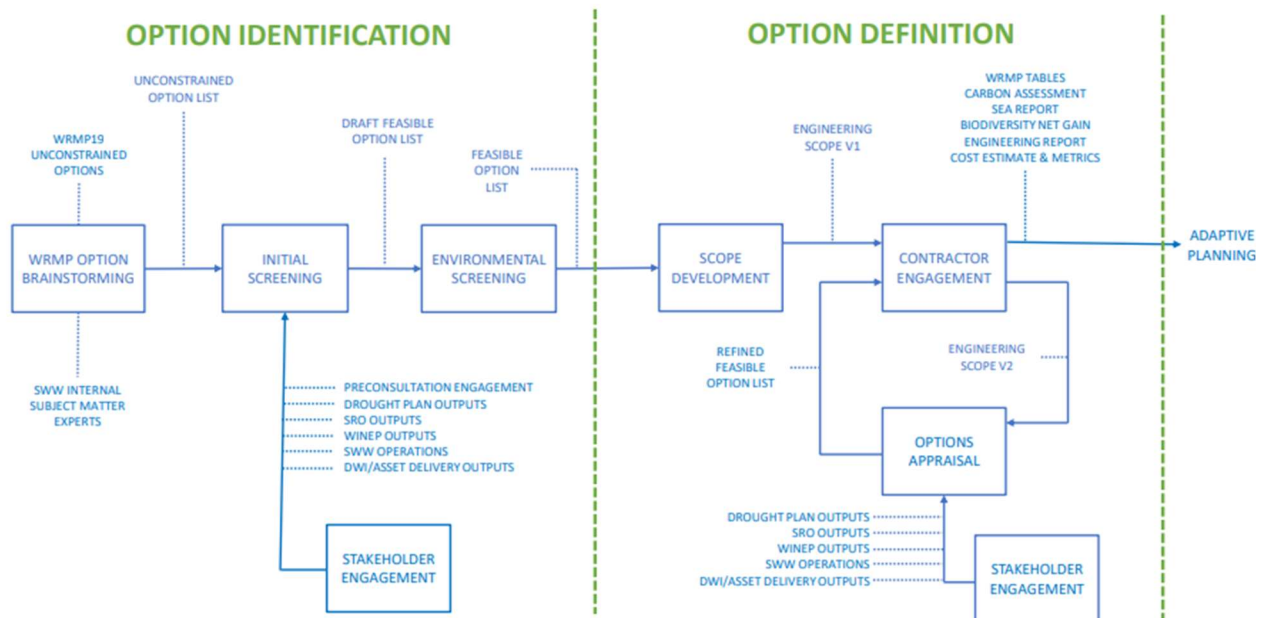


Figure 1 - Overview of SWW WRMP Supply Options Development Process

¹ Water resources planning guideline (Version 10 updated December 2021)

² Our aspiration is to identify as many feasible options as possible, our criteria for selecting feasible options is to allow all schemes to progress which have not been screened out by the factors set out in Table 1 below.

³ Appendix 8.1 details a list of executive summaries for options, all of which have an engineering scope v1 document and most of which have an engineering scope v2 document in development. SWW are currently working with external contractors in the Option Definition phase. Our dWRMP will be updated to reflect this work prior to our Statement of Response.

- A peer-reviewed, technical engineering document detailing the scope for robust, future-proofed options that will enable customer support, highlighting any risks/dependencies for implementation, and enable planning scenarios for cost/benefit/carbon/biodiversity net gain.
- Costs developed by SWW's cost consultants (Chandler KBS) in accordance with SWW's PR24 costing methodology. The total net-present cost and net-present benefits were calculated using the Treasury standard declining long-term discount rate as set out in the HM Treasury 'Green Book.'⁴ (Option Development).
- Carbon estimates for each option following the latest government guidance⁵ developed by our framework partner Stantec. See Annex A for further information.
- Strategic Environmental Assessments (SEA) Report – Including but not limited to, impacts on the environment, river basin management plans and the Water Framework Directive, including environmental and social impacts⁶ and Compliance with drinking water safety plans & associated risks⁷. See Annex B for further information.

The following section goes through the options development process and explains the detailed methodology used.

1.2 Changes in approach since WRMP19

Our overall methodology largely remains the same as that used in WRMP19. Our process and data sources have not fundamentally changed since WRMP19.

However, due to the change in the supply-demand balance, more options have been progressed through the initial high-level screening stage.

Following feedback from the EA on our most recent Drought Plan methodology, it was agreed that an additional screening step would be taken to review the draft feasible options in more detail from an environmental perspective, between the 'unconstrained' and 'feasible' option stages. This was completed by Mott MacDonald.

⁴ HM Treasury Green Book (HM Treasury 2020).

⁵ [Carbon valuation - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

⁶ The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

⁷ Drinking Water Inspectorate Guidance to water companies, **Guidance note: long term planning for the quality of drinking water supplies water resources and sufficiency of supplies**, Issue date June 2020.

2 Option Identification

From the water resources planning guideline, supply side options are required if any of the following are present:

- A deficit in the supply-demand balance
- An increase in supply, either regionally, nationally or to other sectors
- To address government expectations and targets
- To address customers or local stakeholders' preferences, concerns and issues
- To ensure the efficient use of water

In **Chapter 7: Headroom, Baseline and Future Challenge**, we identified that all these drivers apply to our operational context, and therefore we have developed options to address all the above drivers.

The different types of supply-side options that we must consider have been split into the following three categories:

- Distribution expansion and production-side management options to increase supply
- Water resource management options to increase supply
- Water trading options and interconnections with neighbouring water companies

2.1 WRMP Option Brainstorming

For each category, we developed a set of unconstrained supply-side options that are intentionally comprehensive to ensure that nothing is missed and that all possible options are considered. They are not limited, at this stage, by factors such as environmental and planning restrictions; health and safety regulations; legal restrictions; promotability; and/or risk. They are, however, screened to ensure that they are technically feasible.

We used the list of generic options from the *UKWIR WR27 Water resources planning tools 2012: summary report* as a prompt to identify the list of all possible, unconstrained, options. We also review literature to identify any new generic option types, which were then added to the list.

Table 1. details the screening criteria used for option appraisal and Table 2 lists the scheme types and the outcome of the appraisal.

Scheme Type	Rationale
Feasibility and risk	Known political and/or customer unacceptability
Engineering	Complexity and technological risks
Performance	Likely scale of benefit (yield) Resilience benefits
Operational	Unacceptable compliance risks Operability
Environmental	Known environmental obstruction
Socio-economic	Socially and economically unacceptable
Carbon	Embedded and/or operational impacts Risk to acceptability and compliance

Table 1 - List of Generic Screening Criteria

Scheme Type	UKWIR	Y or N?	Rationale
Infiltration galleries	Y	N	Environmental, feasibility, risk and operational
Aquifer recharge	Y	N	No known opportunities
Re-use of existing private supplies taken out of service	Y	N	No known opportunities
Imports (icebergs)	Y	N	Performance, socio-economic feasibility and risk
Rain cloud seeding	Y	N	Performance, socio-economic feasibility and risk
Tidal Barrage	Y	N	Significant environmental impact and impact on natural capital
Abstraction licence trading	Y	N	No known opportunities
Water quality schemes that may also increase the deployable output of source works	Y	N	No known opportunities
Catchment management schemes that promote increased yield of sources ⁸	Y	Y	No schemes identified, pilot farm scale interventions. See S.3.1.
RWM system leakage detection and reduction	Y	N	No known opportunities
Reservoir desilting and dredging to increase capacity	N	N	Performance, engineering and operational
Options for storing water (surface water/stormwater runoff, gravel pits)	N	N	No known opportunities
Reclaimed domestic greywater reuse in situ	N	N	Engineering and performance
Sewer mining	N	N	Feasibility and risk
Condensate recovery for non-potable use	N	N	Engineering, socio-economic
Reduction in reservoir water evaporation	N	N	Engineering, socio-economic
Using saline water for non-potable use	N	N	Engineering, Performance
Collection of water from large solar farms	N	N	No known opportunities

Table 2 - List of example Scheme Types and their Suitability to SWW

We initially added the known options from the current WRMP19 and the current Drought Plan (including extreme drought options) to the unconstrained list. Then new options were developed against the generic list for each category. We considered options at both the WRZ and company-wide level.

Through our regular meetings with our wider stakeholders (Refer to Chapter 3 for more details) and the West Country Water Resources Group (WCWRG), we have ensured we have identified any regional or joint water-company options.

⁸ While no current feasible options have yet been identified, work is still ongoing to look at catchment options – see Section 2.3 below.

This engagement also ensured that we identified any potential third-party options. A 'call for options' was also advertised on the WCWRG and SWW websites, and emails were sent to retailers to notify them of the press release. We have approached quarry owners for possible use or purchase of disused quarry pits. Any options were added to the unconstrained list for further screening, development and engagement.

We have also considered options to reduce outage - the risk of temporary or short-term losses of supply whether unplanned or planned. Given the underlying levels of unplanned outage this is currently not a material water-resources planning risk. For example, during the current drought we have been able to maintain outage levels below those set out in WRMP19 for our Colliford zone.

Whilst we continue to improve our project management capabilities to reduce outage, particularly during critical periods, we have not identified any specific options to reduce planned outage. Similarly, for unplanned outage we continue to improve our asset management approaches to manage risk appropriately and whilst we may achieve marginal gains from continuous improvement, we have not identified any options specifically to reduce unplanned outage. Our approach to calculation of outage is set out in Chapter 5.1.

Through the initial brainstorming process, we also considered whether opportunities could be identified to improve the quality of water resources from which we abstract. The thought experiment we evaluated was whether improved raw water quality would allow an increase in resource availability – for example could lowering nutrient loads entering a reservoir reduce algal blooms in the summer which in turn would make the water easier to treat increasing production potential. We have not identified any material interventions beyond those already being covered by our Upstream Thinking project - a multi-award-winning catchment management scheme which applies natural landscape-scale solutions to improve water quality and supply. Upstream thinking is already tackling 80% of our drinking water catchments and will continue to evolve and in coming years – effectively providing protection for our drinking water sources.

The project is delivered through a unique range of partnerships between ourselves, Westcountry Rivers Trust and Devon and Cornwall Wildlife Trusts, government agencies, environmental experts, landowners and tenant farmers, whilst the evaluation of the change in water quality at catchment scale is undertaken by the University of Exeter.

Note that through our Drought and Resilience Programme we have separately considered projects that could potentially deliver us drought supply benefits in 2022/23 or create opportunities to transfer water more easily around our region. While many of those projects provide drought supply benefits only, some of them provide drought supply benefits and ongoing water resource resilience benefits (e.g., our proposed Cornwall desalination programme). As noted in Chapter 1, schemes which are not licenced or constructed are not included in the baseline for this dWRMP but will be progressed to a stage where they can be included in by the time of our Statement of Response.

2.2 Initial Screening

The initial list of unconstrained options was developed and modified, with options added and rejected, as part of the WRMP24 planning round and following internal workshops with technical experts in Water Resources, Operations and Asset Management. The list of unconstrained options went through an initial screening where all options were assessed against the agreed coarse screening criteria, Table 1 above.

The following steps were undertaken during the screening

- **An appraisal against the above seven screening criteria**, with the addition of a new upfront environmental screening, delivered in partnership with Mott MacDonald
- **Formulation of a register of the rejected options** is developed, with the reasons for the rejection being recorded (e.g., Rejections are typically due to an unacceptable constraint or scoring poorly against multiple criteria). These options are presented in Table 3 and Table 5
- **Formulation of a list of options which are not being progressed** at this time but will undergo further development and investigation in AMP 8. These options are presented in Table 4 and Table 6
- **Liaison with the EA** concerning the unconstrained options to ensure early 'buy-in' and to inform the next stage of screening (this list is not fixed, and new options continue to be added and reviewed throughout the planning process)
- **Production of a high-level option scope** (i.e., source of water, main operational features, operational area, option dependencies).
- **Cost Assurance** – Generation of cost estimates and associated metrics, in conjunction with Chandlers KBS.
- **Carbon** – Provision of assessment of carbon related metrics (e.g., embodied carbon, operational carbon) for the best-value plan options

- **Biodiversity Net Gain and Natural Capital** – Provision of monetised value for detriment/benefit of proposed WRMP supply option for the best value plan options

2.3 Unconstrained Options

The full lists of rejected and ‘not being progressed’ unconstrained options, the high-level scheme composition and the screening decisions are presented in Tables 3, 4 5 and 6 below.

Within the first 2 tables we distinguish between:

- Some options have been rejected outright due to an unacceptable constraint, for example, no resource benefit or a combination of several constraints (Table 3 / 5).
- Other options have not been rejected outright but cannot progress further at this stage due to a lack of information. This may be due to a lack of environmental investigation data, scoping, costing and carbon costs. These options will undergo further development and screening in the future (Table 4 / 6).

Potential catchment-management schemes that promote increased yield of sources remain under consideration and have also been discussed with the EA. Further work is ongoing through our existing catchment-management delivery programme. We have yet to identify any catchment-management opportunities that have a definite increased yield that would allow them to be included in our WRMP. However, as part of the forward Upstream Thinking (UST) Programme, ‘Water Resources’ has been added as a driver, and suppliers are being challenged to include this new driver in their delivery.

Similarly, our ‘thousand ponds’ initiative, which is gaining momentum through stakeholder engagement, has not yet been developed to a stage at which its benefits can be quantified.

The potential addition of repurposed mines and quarries and desalination as supply side options for our SWW WRZs are being developed in response to the current (2022) drought. At this time, no specific options can be included within our feasible list. Work is ongoing and we envisage options will be progressed to a stage where they can be included in our approach by the time of our Statement of Response. [Refer to Annex C of this Chapter](#) for more information on our considerations on the use of desalination as part of our revised dWRMP.

Option ID	Title	Category	Reason for rejection	Potential Yield ⁹
N/A	Increase Colliford annual licence	Resource	Part of the WINEP 24. No potential for licence changes until investigations are completed. NB] Through our response to the current drought we are fast tracking environmental investigations	2-10 MLD
N/A	Colliford pumped storage scheme - uprating current system	Resource	Part of the WINEP 24. No potential for licence changes until investigations are completed.	2-10 MLD
N/A	Raise Porth Dam	Resource	Part of AMP7 WINEP. Agreed that pilot would be developed for WRMP24 - Avon Dam.	<2 MLD
N/A	Colliford - Other groundwater developments	Resource	No disused pits identified. Normal developments via boreholes not viable due to adverse geology.	N/A
N/A	Gunnislake to St Cleer transfer	Distribution	Currently no resource increase from providing additional water to St. Cleer, although greater system flexibility to share existing resources. Part of Green Recovery Programme and the wider South Devon Strategy being developed for PR24.	<2 MLD
N/A	Colliford - New joint shared asset	Shared asset	Limited possibility due to geographical location. No known opportunities.	<2 MLD

⁹ Indicative range (annual average) in MLD

Option ID	Title	Category	Reason for rejection	Potential Yield ⁹
N/A	Crowdy Reservoir desilting	Resource	Ongoing investigations with Stannon and the Camel catchment need to be resolved before consideration of changes to Crowdy operation.	<2 MLD
N/A	Booster pumps installation at Roscrow	Distribution	BAU - delivery during AMP7.	N/A
N/A	College WTW - increase supply area	Production	Duplicate - covered in COL16	N/A
N/A	Gunnislake to St. Clee to Fox Park transfer	Distribution	Part of Green Recovery Programme and the wider South Devon Strategy being developed for PR24.	<2 MLD
N/A	Colliford - WTW wash water reuse	Production	Reviewed and became part of AMP7 delivery for Restormel WTW.	N/A
COL1	Restormel annual licence increase - Increase to the annual limit to the abstraction licence to take additional water from the River Fowey at the Restormel intake.	Resource	<p>This licence variation provides a significant opportunity to strengthen the resilience of the Colliford system.</p> <p>Feedback from the EA has directed us towards further fisheries and ecological studies, particularly in light of future ED requirements and climate change impacts, before this option is taken forward.</p> <p>We have commenced these investigations in 2022 and will also include this option as a scheme for WINEP24.</p>	2-10 MLD
COL7	Blackpool Pit Option 1. Transfer to Restormel WTW.	Resource	Our response to the current drought has meant that we are reappraising this option and seeking further engagement with the pit owners – we are optimistic that this option could now be viable. However, access to the water has not yet been negotiated and as such the option remains outside of our dWRMP 3 rd January 2023, this position will be reviewed in 2023.	2-10 MLD
COL8	Blackpool Pit Option 2. On site treatment and transfer to Bunney Service Reservoir.	Resource	Our response to the current drought has meant that we are reappraising this option and seeking further engagement with the pit owners – we are optimistic that this option could now be viable. However, access to the water has not yet been negotiated and as such the option remains outside of our dWRMP 3 rd January 2023, this position will be reviewed in 2023.	2-10 MLD
COL10a	Goonbarrow Pit Treat onsite	Resource	The pit is being considered for alternative use by the owners who do not wish to sell the site or consider any abstraction.	2-10 MLD
COL10b	Goonbarrow Pit Transfer and treat at Restormel WTW	Resource	The pit is being considered for alternative use by the owners who do not wish to sell the site or consider any abstraction.	2-10 MLD
COL14	Restormel WTW Improve site water efficiency and reduce site losses	Production	BAU - current projects will be completed in 2022. Other improvements included in the scoping and costing for option COL15.	2-10 MLD
COL17	Stithians WTW - reduce WTW minimum capacity	Production	Further investigations revealed that the minimum WTW capacity is lower than understood. There is no longer potential to gain resource through this approach at this site.	<2 MLD
COL16	College WTW improvements - treatment and distribution system	Production	Capital scheme recently completed. Extended period of re-commissioning is required to see if there is any scope for additional resource availability. Potential to review for WRMP29.	<2 MLD

Option ID	Title	Category	Reason for rejection	Potential Yield ⁹
COL13	Drift network improvements Increase the use of Drift Reservoir.	Distribution	Demand analysis indicates likely increases in supply area which would remove any surplus available for transfer.	<2 MLD
N/A	Roadford Reservoir winter pumped storage from the River Lyd.	Resource	Project is being delivered during AMP7 as part of Green Recovery.	N/A
N/A	Roadford Reservoir winter pumped storage from the River Tamar at Gatherley.	Resource	Project is being delivered during AMP7 part of SWW Green Recovery Programme.	N/A
N/A	Loxhore water quality - pesticide issue	Resource	Included in the WINEP. Currently issues being investigated with potential resolution by the end of AMP7.	<2 MLD
N/A	River Taw and Torridge abstractions	Resource	Significant environmental barriers due to the presence of pearl mussels. No abstraction is likely to be agreed by NE and EA.	>10 MLD
N/A	Abstraction from Upper River Tavy	Resource	Not required with Gatherley. Will not be considered until new Gatherley licence is clear.	2-10 MLD
N/A	Further abstraction at Lopwell	Resource	Not required with Gatherley. Will not be considered until new Gatherley licence is clear.	2-10 MLD
N/A	Reduce Gunnislake prescribed flow to Q95	Resource	Not required with Gatherley. Will not be considered until new Gatherley licence is clear.	2-10 MLD
N/A	Wistlandpound Reservoir water quality	Resource	Improvements to WQ in AMP7. e.g. recent installation of Resmix.	N/A
N/A	Re-introduce the use of Gammaton reservoir	Resource	Following AMP7 WINEP it was agreed that the licence would be revoked, and any future use of the source would only be through a drought permit.	2-10 MLD
N/A	Increased abstraction from Meldon to Roadford reservoir or directly to Northcombe WTW	Resource	Reference Meldon/Vellake to Northcombe WTW option which incorporates this option.	<2 MLD
N/A	Roadford - Other groundwater developments	Resource	The local geology does not support groundwater use in sufficient quantities for public supplies.	<2 MLD
N/A	Meldon/Vellake to Northcombe WTW	Resource	Uncertainty remains around final scope of Green Recovery and PR24 Strategy and the potential closure of Prewley WTW.	2-10 MLD
N/A	Roadford zone network reinforcement and transmission improvements.	Distribution	Part of RAPID studies.	<2 MLD
N/A	Dennis Down Booster Pumping Station	Distribution	BAU - being delivered as part of 2022 drought response.	N/A
N/A	Strategic main - Littlehempston WTW to South Devon	Distribution	No clear WAFU benefit due to current restrictions at Littlehempston WTW. See Option ROA16.	<2 MLD

Option ID	Title	Category	Reason for rejection	Potential Yield ⁹
N/A	Strategic mains - Northcombe WTW to North Devon	Distribution	Needs water available from Northcombe WTW. Strategy part of PR24 business plan.	<2 MLD
N/A	Challacombe abstraction licence	Resource	BAU - abstraction licence application submitted in AMP7, further work with EA required to complete.	2-10 MLD
N/A	Bratton Fleming WTW improvements	Production	No WAFU benefit	N/A
N/A	Fernworthy to Tottiford raw water main	Resource	BAU - investigations and maintenance are continuing as part of AMP7 project delivery.	<2 MLD
ROA1	Dart intake licence - Increase daily abstraction limit from the River Dart from 27 to 30 MI/d. Install compliant eel screens capable of 30 MI/d.	Resource	Recent discussions with the EA over ED and risk of deterioration highlighted their concerns over additional abstraction from the Dart. Included as a scheme in WINEP24.	2-10 MLD
ROA5	Lee Moor quarries	Resource	SWW Property have confirmed that the pit is being considered for alternative use by the owners who do not wish to sell the site or consider any abstraction.	2-10 MLD
ROA9	Upper Tamar WTW -reduce WTW minimum capacity	Production	Further investigations revealed that the minimum WTW capacity is lower than understood. No further potential to gain resource.	<2 MLD
N/A	Abstraction from the Culm	Resource	Not likely to result in significant WAFU benefit.	<2 MLD
N/A	Abstraction from the Creedy	Resource	Not likely to result in significant WAFU benefit.	<2 MLD
N/A	River Axe intake with reservoir storage	Resource	Detailed studies and work delivered in the 1990s. EA preference is for no additional reservoir storage.	2-10 MLD
N/A	Greatwell new borehole	Resource	BAU - Borehole drilled and will be commissioned in AMP7.	N/A
N/A	Kersbrook new borehole	Resource	BAU - Borehole will be drilled in AMP7.	2-10 MLD
N/A	New abstraction from River Exe to Allers WTW	Shared asset	Considered and discounted by RAPID. ED - SWW query output of modelling of water availability.	2-10 MLD
N/A	Quartermile Lane booster pumping station	Distribution	BAU - will be delivered in AMP7.	N/A
N/A	Whitecross network improvements	Distribution	Improvements made during AMP. Any additional benefits would only be derived from large mains reinforcement project.	N/A
N/A	Pynes WTW to KTT 12 MI/d - pressure issues	Production	Awaiting results of assessment.	2-10 MLD
N/A	Wimbleball - WTW Efficiency improvements	Production	BAU - WTW efficiency works being assessed and completed in AMP7.	2-10 MLD
N/A	Wimbleball - WTW wash water reuse	Production	BAU - WTW are being assessed and work completed in AMP7.	N/A
N/A	Wimbleball - Reducing WTW	Production	No appropriate benefit identified for any WTWs in this zone.	<2 MLD

Option ID	Title	Category	Reason for rejection	Potential Yield ⁹
	minimum capacities			
N/A	New/refurbished WTW at Capel Lane to treat Squabmoor water.	Resource and Production	No land available to build WTW. Size of Squabmoor reservoir constrains feasible scheme.	2-10 MLD
N/A	Ottertton to Dotton raw water main	Resource	BAU - will be delivered in AMP7.	N/A
WIM3	Hook springs annual abstraction increase	Resource	Due to concerns over the impact on the River Kit the EA have confirmed that Hook Springs should be included in WINEP24.	<2 MLD

Table 3 - List of supply-side rejected options – SWW WRZs

Option ID	Title	Category	Reason for not being progressed	Potential Yield
N/A	Avon raw water being lost between dam and WTW.	Resource	Needs further investigation, any water savings will be achieved in AMP7.	<2 MLD
N/A	Trekeivesteps Withey Brook licence aggregate	Resource	Significant uncertainty. Further discussions required with EA.	<2 MLD
N/A	Park licence change - take 12 Ml/d for a period	Resource	Significant uncertainty around large/sustained drawdown requires further study. An extended test involving drawing the reservoir down over multiple seasons is required; this is likely to require a licence change or approval of a groundwater investigation by the EA. Hydrological modelling and detailed Structural Engineering assessment required before a permanent option can be developed. We will progress discussions with the EA around licence changes or a groundwater investigation consent to allow this testing. The outcomes of investigations will determine whether this option could be considered in WRMP29 or before.	2-10 MLD
N/A	Raise Drift Dam	Resource	Significant uncertainty. Agreed that pilot would be developed for WRMP24 - Avon Dam.	2-10 MLD
N/A	Stithians pumped storage scheme	Resource	Significant uncertainty. Not likely to provide significant additional yield.	<2 MLD
N/A	Fox Park Pipeline (St. Cleer to Foxpark)	Distribution	Significant uncertainty around scheme benefit. Work ongoing to understand option more fully.	<2 MLD
N/A	St. Cleer WTW - improved treatment of poor quality raw water	Production	Resource gain uncertain, additional modelling required.	2-10 MLD
N/A	Brockenburrow licence - increase daily abstraction and query seasonal constraint	Resource	Uncertainty of water resource benefit. Needs hydrological modelling and discussion with the EA.	<2 MLD
N/A	Swincombe into Venford licence (October clause)	Resource	Significant uncertainty. Needs hydrological modelling and discussion with the EA.	<2 MLD

Option ID	Title	Category	Reason for not being progressed	Potential Yield
N/A	Vary Avon licence to reduce compensation flow	Resource	Significant uncertainty - the EA have indicated that it would like to increase the CF. Included as a scheme in WINEP24.	<2 MLD
N/A	Metherall Quarry - Transfer water from Metherall Quarry into Fernworthy Reservoir.	Resource	Significant uncertainty – expected to be low WAFU benefit.	<2 MLD
N/A	Raise Meldon Dam	Resource	Significant uncertainty. Agreed that pilot would be developed for WRMP24 - Avon Dam.	2-10 MLD
N/A	Raise Upper Tamar Lakes Dam	Resource	Significant uncertainty. Agreed that pilot would be developed for WRMP24 - Avon Dam.	<2 MLD
N/A	Further pumped storage of Wistlandpound from River Bray or raising of Wistlandpound dam	Resource	Significant uncertainty. Agreed that pilot would be developed for WRMP24 - Avon Dam.	<2 MLD
N/A	Pumped storage of KTT from the Teign	Resource	Significant uncertainty of WAFU benefit	2-10 MLD
N/A	Red and Left Lake - Transfer from Red Lake and Left Lake into the River Erme for abstraction at Erme Intake	Resource	Significant uncertainty - likely very low WAFU benefit, very remote site which will lead to greater delivery complexity and costs.	<2 MLD
N/A	Increase to Northbridge licence	Resource	Requires discussion with the EA and extensive investigations.	<2 MLD
N/A	Reduce Thorveton prescribed flow	Resource	Requires discussion with the EA and extensive investigations.	<2 MLD
N/A	Raising Wimbleball dam and stage 2 of Wimbleball pumped storage	Resource	Requires discussion with the EA and extensive investigations.	>10 MLD

Table 4 - List of supply side options “on hold” awaiting further information – SWW WRZs

Option ID	Title	Category	Reason for rejection	Potential Yield
N/A	Increases in WAFU in the Bournemouth Water supply area - river	Resource	No water available.	<2 MLD
N/A	Increases in WAFU in the Bournemouth Water supply area - reservoir	Resource	No suitable site identified.	2-10 MLD
N/A	Knapp Mill WTW - move intake downstream into brackish water.	Resource	Regulator indicates desalination should not be considered if other options are available.	>10 MLD
N/A	Potential transfer to Southern Water 20 MI/d in AMP7 BP.	Shared asset	Scheme is no longer viable. No water available.	N/A
N/A	Blashford Lakes	Resource	Land acquisition issues prevent progress with this scheme.	2-10 MLD

Option ID	Title	Category	Reason for rejection	Potential Yield
N/A	Strategic mains within Bournemouth WRZ	Distribution	No gain in deployable output (DO).	N/A
N/A	Bournemouth - Increase WTW efficiency	Production	Alderney and Knapp Mill accelerated in Green Recovery Plan 2025 delivery	N/A
N/A	Bournemouth - Decrease WTW losses	Production	Alderney and Knapp Mill accelerated in Green Recovery Plan 2025 delivery	N/A
N/A	Bournemouth -WTW wash water reuse	Production	Alderney and Knapp Mill accelerated in Green Recovery Plan 2025 delivery	N/A
N/A	Bournemouth - Increase WTW to licence maximum	Resource	Licenses are being reviewed for likely reductions. No gain in deployable output (DO).	N/A
N/A	Re-introduce Wimborne WTW	Resource	Wimborne licence being incorporated into Longham licence as part of regional strategy.	2-10 MLD
BNW4	Woodgreen - new borehole development	Resource	Groundwater modelling results indicated no potential for additional abstraction in the main chalk aquifer to protect the environment. High-level environmental screening also highlighted several issues.	<2 MLD
BNW9	Woodgreen. Hydraulic restriction.	Distribution	BAU – Investment being delivered within the current AMP.	N/A
N/A	Desalination plant for the Fawley transfer water.	Production	Previously rejected by Regulators when submitted by Southern Water.	>10 MLD
BNW5	Hydrogeological survey of whole area.	Resource	Groundwater modelling results indicated no potential for additional abstraction in the main chalk aquifer to protect the environment.	2-10 MLD
BNW2	Stanbridge - part of revised use of Stour. Smarter conjunctive use of the Stour sources	Resource	No WAFU benefit identified. Moving the licence will not increase the water available.	N/A

Table 5 - List of supply side rejected options – Bournemouth

Option ID	Title	Category	Reason for not being progressed	Potential Yield
BNW15	New reservoir in the upper Dorset Stour	Shared asset	Following site visits and detailed review this site and other sites have been deemed technically infeasible for potential development. Wessex Water have removed this option from their WRMP24 plan. Further planning work will be included in next 5 years.	>10 MLD
BNW12	Holdenhurst WWTW IPR 1 Additional treatment at Holdenhurst before pumped transfer to the River Avon.	Resource	Significant uncertainty around option. Unlikely to be acceptable for environmental reasons.	>10 MLD
BNW10	Christchurch WWTW IPR 1 Additional treatment at Christchurch before pumped transfer to River Avon.	Resource	Significant uncertainty around option. Unlikely to be acceptable for environmental reasons.	>10 MLD

Option ID	Title	Category	Reason for not being progressed	Potential Yield
BNW13	Holdenhurst WWTW IPR 2 Additional treatment at Holdenhurst before pumped transfer to Longham Lakes.	Resource	Significant uncertainty around option. No feasible pipe route between Holdenhurst and Longham – discounted due to complexity / significant cost.	>10 MLD
BNW14	Ibsley Lake	Resource	Significant uncertainty around option.	2-10 MLD
BNW16	Christchurch and Holdenhurst WWTW IPR 3 - further treatment and transfer to Knapp Mill WTW	Resource	Significant uncertainty around option. Christchurch option would reduce River Avon flows and may be environmentally unacceptable.	>10 MLD

Table 6 - List of supply side options on-hold awaiting further information – Bournemouth

3 Option Development

The 157 unconstrained options were reduced to 40 feasible options, 33 options in Colliford, Roadford, and Wimbleball water resource zones, and 7 options in Bournemouth water resource zone. The lists are shown in Table 7 and Table 8. Each option will be accompanied by the following outputs:

- Non-technical executive summary (see appendix 8.1)
- Technical document (PowerPoint Presentation)
- Carbon Assessment (Stantec Carbon Report) See Annex A for further information.
- Cost Estimate (Chandlers KBS report)
- Strategic Environmental Assessment Report (a combined report using inputs from HRA, INNS, WFD etc) See Annex B for further information.
- WRMP Table 4/5/5a-c input data and methodology

Some schemes are still awaiting carbon and natural capital assessments, these are part of an additional phase of feasibility work and will be provided as part of our revised dWRMP, submitted with our Statement of Response.

For an option to be feasible it must have passed through the selection process without being screened out - the criteria we have used to select feasible options is that they must not have been screened out by the testing process described above. Our objective is to create a large pool of feasible options to maximise the opportunities for optimisation in subsequent stages of the planning process.

Option ID	Title	Source: Surface or ground water	Scheme composition	TOTEX (£m)	WAFU (ML/D)	AIC (p/m3)	NPC (£m)	Total Carbon Cost (£m)	Natural Capital impact of option (£/year)
COL2	Colliford PS Stage 2 - River Camel Abstraction	SW	New intake, pumping station and pipeline.	26.37	5	154.01	58.6	28	£-2,353.60
COL3	Abstraction of Colliford Reservoir compensation flow when making supply releases	SW	Licence change	0.096	1.5	2.04	0.3	TBC ¹⁰	TBC
COL4	Abstraction of Siblyback Reservoir compensation flow when making supply releases	SW	Licence change	0.096	0.75	16.87	1.1	TBC	TBC
COL5	Increase Wendron annual licence and de-couple from Stithians	SW	Licence change	0.056	1.5	31.21	4	TBC	TBC

¹⁰ Further work ongoing to develop and assess all options with 'TBC' for submission with our Statement of Response.

Option ID	Title	Source: Surface or ground water	Scheme composition	TOTEX (£m)	WAFU (ML/D)	AIC (p/m3)	NPC (£m)	Total Carbon Cost (£m)	Natural Capital impact of option (£/year)
COL6	River Hayle abstraction	SW	New intake, onsite water treatment works and pipeline.	18.561	1.5	292.58	34.6	4	-£721.67
COL20	River Fal - New abstraction	SW	New intake, onsite water treatment works and pipeline.	57.4	15	99.36	109.5	25	TBC
COL9	Leswidden Pool	GW	Transfer pipeline	4.873	2.5	205.38	62.6	0.7	£0
COL11	Hawk's Tor Pit ¹¹	GW	Transfer pipeline	6.771	1.5	172.28	21.1	1	£0
COL12	Stannon daily abstraction increase ¹²	GW	Pumps and power upgrades	1.443	2	41.34	3.4	2	TBC
COL15	Restormel WTW	SW	Water treatment works upgrade	13.434	5	1557.48	47.4	5	TBC
COL18	Porth/Rialton ¹³	SW	New intake, onsite water treatment works and pipelines.	33.889	4	205.38	62.6	9	-£419.72
COL19	Boswyn stream/Cargenwen Reservoir/Carwynnen stream	SW	New intake(s), onsite water treatment works and pipelines.	10	1.5	172.28	21.1	TBC	TBC
ROA2	River Erme re-location of surface water abstraction	SW	New intake, pumping station and pipeline.	1.072	1.5	33.54	4.1	2	TBC
ROA3	River Yealm	SW	New intake, pumping station and pipeline.	0.917	1.5	47.66	5.8	2	TBC
ROA4	Abstraction of Roadford Reservoir compensation flow at Gunnislake when making supply releases	SW	Licence change	0.098	2	2.1	0.3	TBC	TBC
ROA15	Gatherley Phase 2	SW	Pipeline	42.641	20	35.86	52.7	18	-£1,164.02

¹¹ May be delivered in 2023 to improve resilience in Colliford Zone, position to be updated if required at final WRMP.

¹² May be delivered in 2023 to improve resilience in Colliford Zone, position to be updated if required at final WRMP.

¹³ May be delivered in 2023 to improve resilience in Colliford Zone, position to be updated if required at final WRMP.

Option ID	Title	Source: Surface or ground water	Scheme composition	TOTEX (£m)	WAFU (ML/D)	AIC (p/m3)	NPC (£m)	Total Carbon Cost (£m)	Natural Capital impact of option (£/year)
ROA6	Upper Tamar Lake increasing annual licence	SW	Licence change	0.077	1	1.53	0.1	3	TBC
ROA14	Raise Avon Reservoir Dam	SW	Raise dam crest, and associated civils.	60.769	2.5	267.47	49.1	TBC	£1,137.07
ROA7	Expansion of Northcombe WTW to 60 ML/d	SW	Water treatment works upgrade	31.154	10	56.861	43.493	111	TBC
ROA16	Littlehempston WTW	SW	Water treatment works upgrade	3.2	6	11.88	5.8	TBC	TBC
ROA8	Tottiford WTW - reduce WTW minimum capacity	SW	Process ICA upgrades	1.035	1	30.49	2.5	0.06	TBC
ROA10	Avon WTW - reduce WTW minimum capacity	SW	Process ICA upgrades	0.896	1	27.02	2.2	0.06	TBC
ROA11	Meldon WTW - reduce WTW minimum capacity	SW	Process ICA upgrades	1.035	1	30.49	2.5	TBC	TBC
ROA12	Slade and Horedown WTW (GAC)	SW	Water treatment works upgrade	1.197	1	41.34	3.4	2	£1,689.42
ROA13	Duckaller and Vennbridge	GW	Licence change, additional pumping and water treatment works upgrade.	26.338	0.4	35.86	53.18	2	£63.90
WIM1	Abstraction of Wimbleball compensation flow when making supply releases	SW	Licence change	0.098	2	4.7	0.8	TBC	TBC
WIM2	Sidford borehole commissioning	GW	Pumping station, headworks, water treatment works and pipeline.	17.917	1.5	290.02	34.3TB	3	TBC
WIM4	Wilmington springs annual abstraction increase	GW	Licence change	0.048	0.2	3.58	0.1	TBC	TBC
WIM8	Brampford Speke borehole	GW	Licence change	0.047	2	8.71	1.4	TBC	TBC
WIM9	Stoke Canon borehole	GW	Licence change, power supply.	0.147	2	9.82	1.6	TBC	TBC

Option ID	Title	Source: Surface or ground water	Scheme composition	TOTEX (£m)	WAFU (ML/D)	AIC (p/m3)	NPC (£m)	Total Carbon Cost (£m)	Natural Capital impact of option (£/year)
WIM5	Indirect potable reuse and stream support for Dotton WTW	SW	Pumping station, pipeline and outfall.	4.126	2	34.47	5.6	TBC	-£83.17
WIM6	Increase Allers WTW capacity - To cover East Devon and East coast in the winter, Dotton at a minimum in the winter. Will require an increase in the Bolham licence (winter) and a reduction in the Dotton licence (winter).	SW	Water treatment works upgrade	7.828	2	91.47	15	6	TBC
WIM7	Increase Pynes to licence limit 66.46 Ml/d	SW	Water treatment works upgrade	13.949	3.25	100.96	25.9	11	TBC

Table 7 - List of Feasible Supply Side Options All WRZ

Option ID	Title	Source Surface or ground water	Scheme composition	TOTEX (£m)	WAFU (ML/D)	AIC (p/m3)	NPC (£m)	Total Carbon Cost (£m)	Natural Capital impact of option (£/year)
BNW1	Borehole development, existing borehole remedial works.	GW	New borehole, headworks and pipeline.	1.692	1	48.6	4.1	1	TBC
BNW3	Wimborne transfer to Longham - Licence change	GW	Licence change	0.129	4	0.98	0.3	TBC	TBC
BNW6	Longham Aquifer Recharge	GW	Boreholes, pumping, pipelines.	10	10	15.51	12.7	3	TBC
BNW7	Mendips Quarry - 30 Ml/d scheme option - raw water transfer and augmentation of the River Stour.	GW	Intake, pumping station(s), pipeline(s).	182.476	30	356.64	182.9	TBC	TBC
BNW8	Poole Harbour FE-reuse	SW	Wastewater treatment, pumping station, pipeline.	61.875	12.5	343.91	57.1	TBC	TBC

Option ID	Title	Source Surface or ground water	Scheme composition	TOTEX (£m)	WAFU (ML/D)	AIC (p/m3)	NPC (£m)	Total Carbon Cost (£m)	Natural Capital impact of option (£/year)
BNW11	Christchurch WWTW IPR 2 - Transfer to Longham Lakes	SW	Wastewater treatment, pumping station, pipeline.	28.974	10	42.56	32.4	4	-£925.50
BNW17	Cheddar Reservoir	SW	New Reservoir with potential to offset demand in Wessex region allowing potential for Bournemouth Water to access other resources, further feasibility work required.	469.9	14	537		TBC	TBC

Table 8: List of Supply Side Feasible Options – Bournemouth

The following maps show the locations of the feasible schemes identified for each WRZ. (fig. 2 to fig. 5).

Figure 2: Colliford Feasible Options

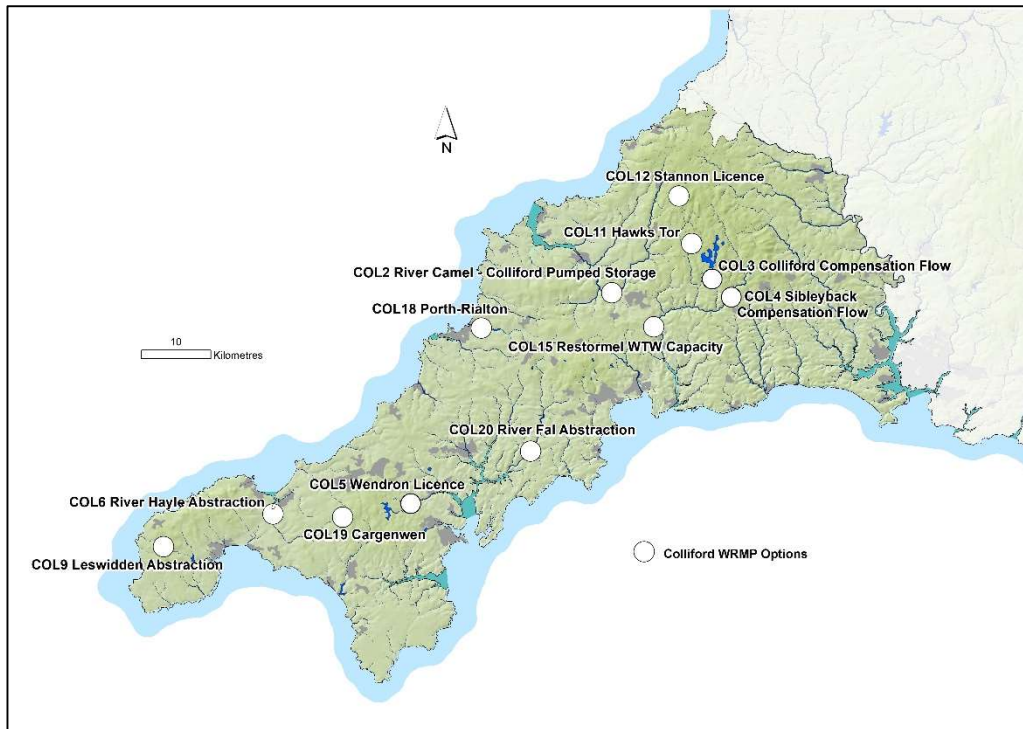


Figure 3: Roadford Feasible Options

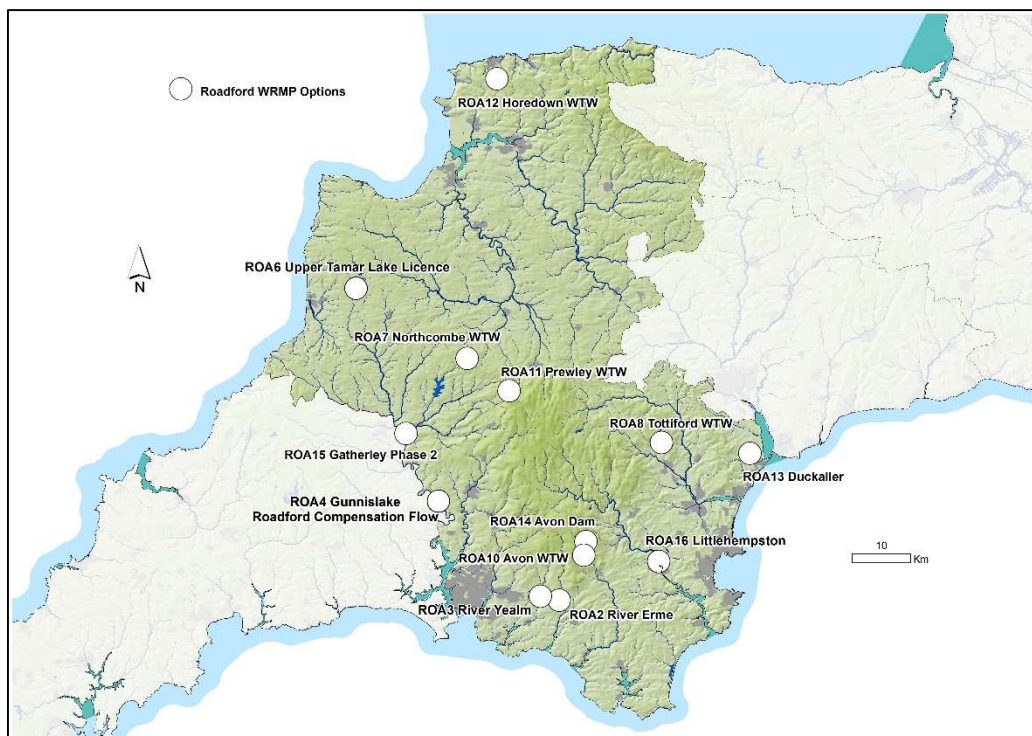


Figure 4: Wimbleball Feasible Options

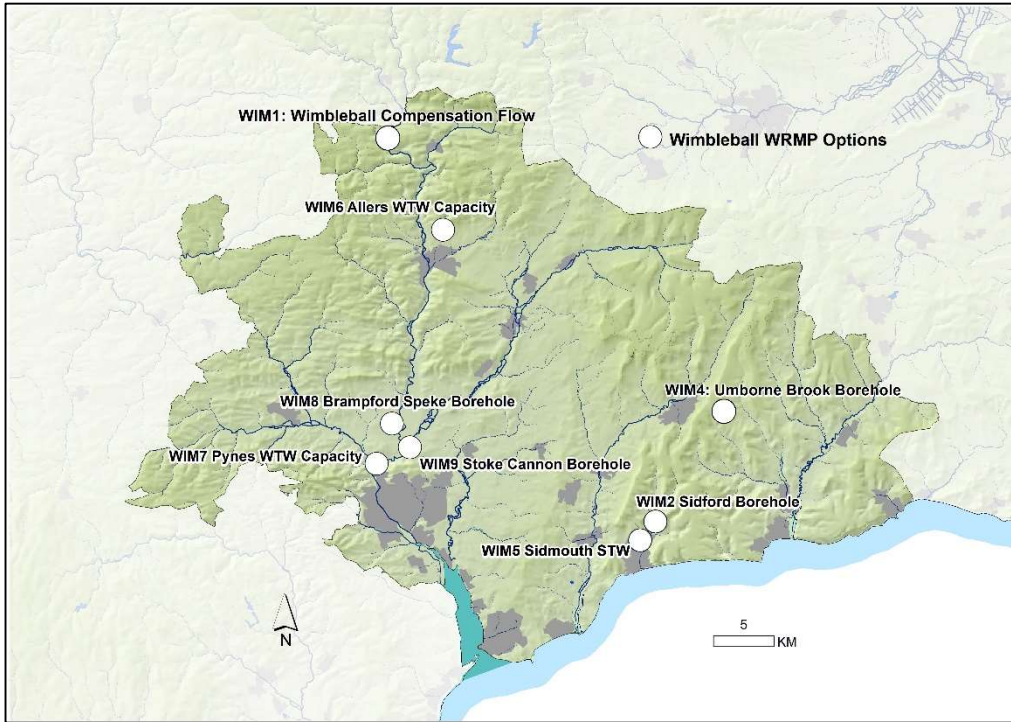


Figure 5: Bournemouth Feasible Options



Annex A: Whole Life Carbon Assessments

The embodied and operational carbon emissions of each option have been assessed using the Stantec in-house carbon accounting tool, which is consistent with the South West Water carbon accounting tool currently under development.

The carbon assessment methodology follows UKWIR guidance (published in 2012 - A framework for accounting for embodied carbon in water industry assets, Report number CL01B207; and updated in 2022 - Calculating whole-life/Totex carbon, Report number 22/CL/01/32), which sets out how to calculate embodied and whole life carbon for water industry assets. This has been applied alongside BEIS (2021) guidance (Updated energy emissions and projections: 2019, published online at: <https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2019>) and HM Treasury (2022) Green Book supplementary guidance to undertake a carbon assessment of the WRMP options.

The tool is based on a tiered approach to take account of the amount of information available. An overview is shown below.

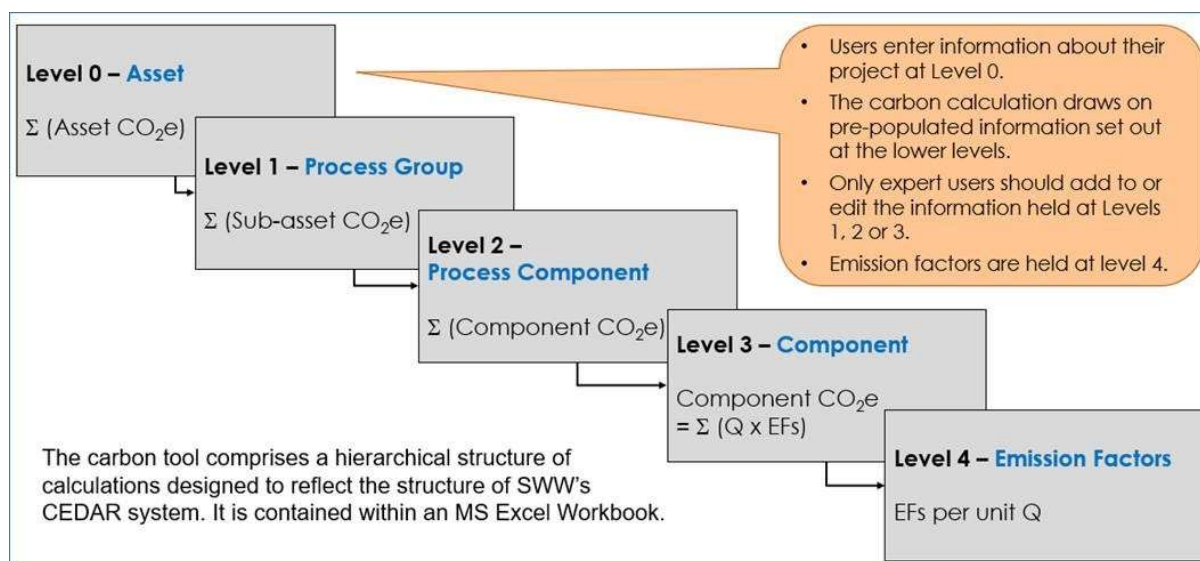


Figure 6 Tiered approach overview of carbon assessment

Annex B: Strategic Environmental Assessment (SEA)

The SEA Assessment Framework, which includes SEA objectives and indicators, was developed and consulted upon as part of the Scoping Stage. The SEA objectives and indicators were used to appraise the WRMP24 options and preferred programme (and alternative programmes) to determine their potential environmental effects. The SWW WRMP24 SEA objectives support the SWW outcomes for customers and the environment; the Department for Environment, Food and Rural Affairs (Defra) 'Guiding Principles for water resource planning'; and the Defra 'Creating a great place for living: Together we are building a green and healthy future'.

A key stage in the scoping process is to determine what topics are relevant for the SWW WRMP24 SEA and what topics (if any) should be scoped out. It is considered that all the SEA Regulations topics are relevant to the draft SWW WRMP24 and therefore they have all been scoped in. The key objectives and issues from the related plans and policies and trends of baseline and future baseline were reviewed to identify key environmental issues and opportunities for SWW and the WRMP for each SEA topic, and how the WRMP24 should seek to enhance the topic area. This includes potential issues such as developmental impacts on designated and non-designated biodiversity sites, impacts on watercourses and loss of soil resources.

Enhancement opportunities relevant to the Plan include biodiversity integration with new infrastructure, supporting water-based habitats through increasing water levels in local watercourses and opportunities for peatland restoration. SWW are developing a proposal to include a biodiversity fund in the final WRMP, which will look to mitigate some of the environmental impacts noted and deliver overall biodiversity net gain. See Chapter 4: Enhancing and protecting the environment and Chapter 11: Our best value plan within the draft WRMP24 for more details.

Annex C: Note on Desalination

As set out above we have considered desalination as an option for our Bournemouth WRZ and have rejected it based on regulatory feedback, including concerns around managing salinity in the 'low mix' waters around the Solent.

We already operate desalination plants on the IoS and plan investment in AMP7 to improve these facilities in line with DWI requirements. Desalination will be at the centre of our strategy for providing drinking water on the IoS for the next 25 years.

As part of our response to the current drought we are revisiting opportunities for desalination in our Colliford supply zone. This activity will change our planning assumptions.

Specifically, we are working to a plan that will restore our reservoir levels to a robust operating position through to the end of 2023. We aim to achieve this through a combination of activities including, relevantly, developing desalination facilities on several locations along the Cornwall coast. None of these initiatives or investments are included in this dWRMP (as per our approach set out in Chapter 1, they are not yet built or licenced), but will be progressed to a stage where they can be included in our water resources plan by the time of our Statement of Response.

We have produced a scenario as part of this dWRMP that assumes an additional 10 MLD of supply availability by 2025 in our Coliford WRZ to understand the impacts of likely supply side increases.



South West
Water



Bournemouth
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