

Draft Water Resources Management Plan

Appendix E – Our Options

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Appendix E – Our options

E1 Leakage

We are committed to achieve a 50% reduction in leakage by 2050. We will do this by employing the best value mix of interventions and options set out below. Each option listed has independent cost against leakage benefit values, however there are secondary benefits.

In AMP7 we were ambitious and set a 15% leakage reduction target for us to achieve which we are on track to deliver. In AMP8 we will continue this ambition, we are committed to deliver in line with customer expectations and reduce leakage by 10%.

Active Leakage Detection and pressure management

Active Leakage Control will allow us to find the leakage and fix accordingly Active Leakage detection will continue to be vital in achieving our leakage targets in AMP8. Investment levels have increased due to us focussing on delivering the 50% reduction. We believe that additional resources will be required to drive leakage lower between 2025 and 2030.

Given our topography, a predominance of small rural communities in remote uphill locations, we will continue to focus on maintaining and upgrading pressure control valves and variable speed drives on pumping stations. The extension of new installations and proactive maintenance will prolong asset life.

We will continue our programme of water balance improvement initiatives so that we account for all water usage accurately and target leakage efficiently.

Mains Renewal & Trunk Mains Renewal

Our mains renewal strategy seeks to balance asset health (mains bursts per km), interruptions to supply, water quality as well as leakage.

Over the long term to achieve a 50% leakage reduction we need to accelerate the replacement of our network to order to reduce the number of leaks that break out.

Mains Renewal investment will increase to help achieve our long term targets. It is important that we start increasing renewal rates now rather than leave the burden to future generations. Our mains renewal rate will rise slightly to enable us to do this.

We will continue to refine our approach to measuring and reporting on trunk mains and service reservoir losses. We are committed to undertake more maintenance and surveys of trunk main assets.

E2 Water efficiency

E2.1 Overview

In line with our understanding of customer, regulator, and government expectations, we continue to offer a range of water efficiency services to our customers. We propose to:

- Provide information to all consumers on how to use water more wisely through hints and tips on our website and through talks to community groups which are offered in person or remotely. In 2020 we introduced a customer portal (Get Water Fit) to help customers better understand their current water use and how they could make small changes to their behaviour to use less water. Customers are also rewarded for completing water saving challenges;

- Provide a range of free water saving products after customers have registered and completed a Get Water Fit questionnaire about their household, usage, and fittings. This allows us to tailor product offers including subsidised water butts;
- continue to engage at the community level through visits and in person or remote workshops and provide education and advice to school children on how to use water more wisely, and;
- Offer home water efficiency checks in partnership with housing associations. We will target our highest consumers, customers who contact us about high bills and customers who report internal leaks to us. Our social housing water efficiency audits in customers' homes to include advice, installation of water efficient devices and the repair of leaks on internal fitting where it is simple to do so.

In developing our proposals, we have made reference to all relevant guidance including; Water Resources Planning Guideline July 2021, Waterwise Evidence Base Reports and used data from our own water efficiency programmes.

To inform our WRMP 24 we have considered a range of enhanced water efficiency options:

- Extending our free water efficiency devices and subsidising higher cost devices
- Enhancing our education and advice to consumers on how to use water more wisely by developing a van that will reach remote communities and schools more easily.

E2.2 Base Plan

We will continue to offer both free and subsidised water efficient product to our customers. We have assumed that these will cease to provide a benefit by 2040 as we will have exhausted customer who are sufficiently engaged on water efficiency to have requested free and subsidised water efficient products.

We will continue to offer the same range of products as now but continue to explore opportunities for introducing new innovative products as they become available. In the past year we have made three new products available to our customers:

- Kitchen stream - a multi-directional tap flow regulator which reduces the flow to 6.9 litres per minute ;
- Toothy timer – which encourages children to brush their teeth twice each day and turn the tap off between brushes, and;
- Garden kit – containing a swell gel, a water mat and soil discs which retain water to discourage the over watering of plants. It also contains drought resistant plant seeds to encourage customers to think more carefully about the plants they put in their gardens in future.

Free products

In 2020 we improved our approach by asking customers to complete a short questionnaire on our customer portal GetWaterFit (GWF) so we are able to understand current use which enables us to offer advice on how to reduce the water they use. By understanding their current fittings we can tailor which products they are able to order. We made this change so we could offer more tailored advice and to ensure customers should only be able to order products they could use thus reducing waste.

We have based our forecast on the number of orders, cost per order and savings per order on data reported in the first half of 2022. We will update this in our final plan.

Subsidised products

The only subsidised products we currently offer are water butts. We have assumed that the number sold in 2021 will be replicated in each year of AMP 7.

Home water efficiency checks (HWEC)

We will continue to offer HWEC opportunities in partnership with housing associations. We will target our highest consumers, customers who contact us about high bills and customers who report internal leaks to us. Our social housing water efficiency audits in customers' homes to include advice, installation of water efficient devices and the repair of leaks on internal fitting where it is simple to do so.

Education

Our Education Team will continue to work with schools on the need to reduce water consumption. This will be through visits to schools and interactive content on our website.

Due to the uncertainty of the benefits of this activity we have not factored in any demand savings in our demand forecast.

We will also continue to promote water efficiency messages through Communications Team again we have not assumed demand savings from this activity.

E2.3 Enhanced options

We continue to explore other options to do more water efficiency than we think is required under s93a Water Industry Act including as above exploring opportunities to extend our HWEC programme.

We are also looking at how we can better promote the availability of free and subsidised water saving devices as we look to increase uptake of products and awareness of the need to use water more wisely as part of this.

Community Van

In line with our approach in Severn Trent, we propose to introduce a community vehicle to help engage more customers on the services we offer including the availability of water efficiency advice and products.

Home water efficiency checks with social housing tenants

We propose to offer home water efficiency checks working with housing associations to offer them to their tenants in our draft plan these are exclusively in Wrexham, but we continue to explore opportunities to extend our current programme to work with more housing associations in other areas.

Trials

In the next year we intend to trial other water efficiency options to increase our water efficiency offering to our customers. These include how we target Home Water Efficiency Checks (HWEC)

Metering

We will continue our strategy of offering meters to customers who want them and upgrading our meters over time to automate read devices. We have not considered compulsory metering.

E3 Supply Options

E3.1 Overview of the process

The WRMP options appraisal process is well established and the water resources planning guidelines produced by NRW, OFWAT and EA sets out a series of clear expectations on what evidence should be considered. Figure E1 is taken from the water resources planning guidelines and illustrates the key steps in the options appraisal process.

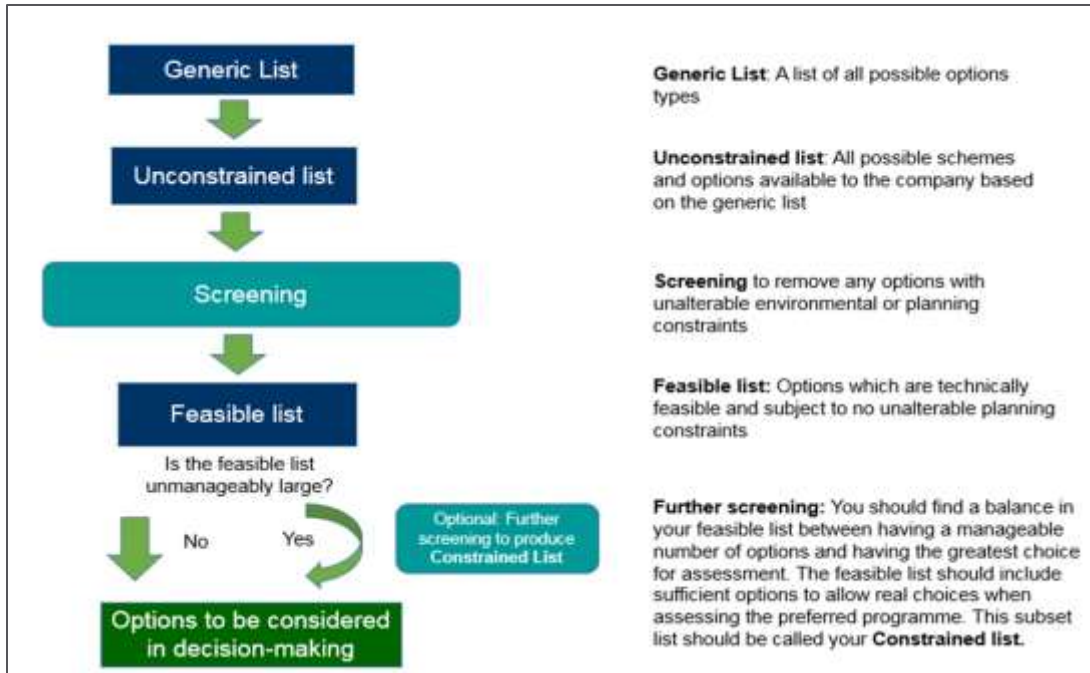
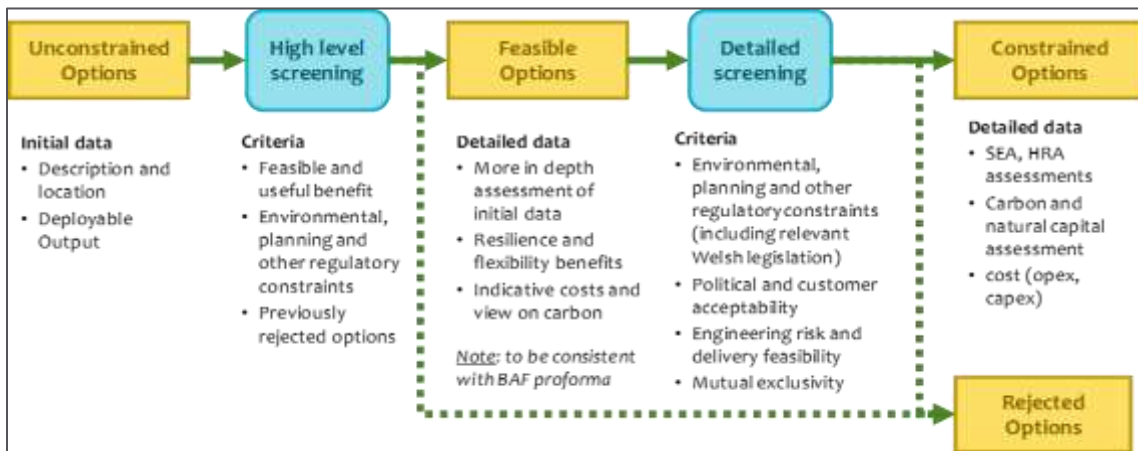


Figure E1: The stages in the dWRMP24 options appraisal process

We have further developed the approach to make sure that our options appraisal is fully incorporated into the regional planning work and the wider environmental appraisal of options. Figure E2 illustrates the options appraisal stages that we and the other Water Resources West companies have followed for our dWRMP24.



Source: Water Resources West “Option Development Methodology” v2.1 05Feb 21. (BAF = Bid Assessment Framework, SEA = Strategic Environmental Assessment, HRA = Habitat Risk Assessment).

Figure E2: The stages of our options appraisal process

One change to the process is that we did not pass our demand side options through the process. This is because we believe that there is no value to be added by assessing ongoing initiatives through the screening process.

E3.2 Unconstrained Options

Previously in our WRMP19 and Dee Valley’s WRMP14 there was a supply surplus across all the water resource zones and thus no driver for identifying or developing supply side solutions. To increase our preparedness in

the event of any potential future deficits in our supply demand balance we developed our list of unconstrained options. We have identified 22 supply options, please refer to dWRMP Table 4 and see table E1 below.

Table E1 – Unconstrained Option Categories

Option Group	Option Type	Number of Options
Distribution Options		2
	Trunk mains renewal/new	2
Production Options		4
	New/enhanced pumping station	1
	Water treatment works capacity increase	3
Resource Options		16
	Catchment management	2
	External raw water bulk supply/transfer	6
	Groundwater enhancement	2
	Reservoir enlargement	3
	Surface water enhancement	3
TOTAL		22

Initial development of our supply demand balance indicated a deficit in Wrexham we therefore concentrated our efforts in identifying options to benefit this WRZ. Consequently, most options identified on our unconstrained list benefit the Wrexham WRZ (18 in total). There are 3 options that benefit Llandinham and Llanwrin and an additional option that benefits both Wrexham and Llandinham and Llanwrin. We have identified 7 third party supply options these range from imports via other water companies (UU, STWL and DCWW) to Coal Authority and CRT (Canals and Rivers Trust). These are very much in their initial stages with no formal offers made. Table E3 summarises our unconstrained options with estimated benefit for the Water Resource Zones (WRZ).

Table E2 – Unconstrained Options estimated benefit (Ml/d)

Option ID	Scheme Name	WRZ Benefitting	Estimated Scheme DO / Yield (Ml/d)
HD 001	Talwrn BH refurbishment	Wrexham	1
HD 002	Pant Glas reservoir DO improvement	Wrexham	2
HD 003	Nant-y-Ffrith IR and Pendinas IR catchment improvements	Wrexham	1
HD 004	Ty Mawr catchment improvements	Wrexham	1
HD 005	Reserving the Pen-y-cae transfer for HD	Wrexham	0.4
HD 006	Dee General Direction Emergency Storage rule change*	Wrexham	3
HD 007	Import from UU via Vyrnwy Aqueduct*	Wrexham	3
HD 008	Import from SVT Whitchurch*	Wrexham	1
HD 009	Import from DCWW (Bretton)*	Wrexham	2
HD 010	CRT Llangollen canal transfer*	Wrexham	tbc
HD 011	Coal Authority options in Wrexham area*	Wrexham	tbc
HD 012	Restore capacity of Cae Llwyd reservoir	Wrexham	1
HD 013	Expand Llwyn Onn WTW's	Wrexham	4
HD 014	Re-commission/rebuild Legacy WTW's	Wrexham	8
HD 015	Re-commission disused source at Abersychnant	Wrexham	4
HD 016	Enhance pipework to reservoir at Marchwiell	Wrexham	tbc
HD 017	New raw water pumping station at Legacy	Wrexham	tbc
HD 018	Resilience from Clywedog Reservoir	Llandinam	tbc
HD 019	Import from SVT/DCWW Elan Reservoir to Llandinam Pipe*	Llandinam	6
HD 020	Increase Llandinam WTW output with additional raw source	Llandinam	2
HD 021	Recommission disused reservoir at Esgaireira	Llandinam	1
HD 022	Llwyn Onn WTW DO Recovery	Wrexham	6

*Third Party Option

E3.3 High level screening

We then carried out a high-level screening review of the unconstrained list so that we could exclude any options that have obvious reasons that would prevent them from being constructed. Each of the Water Resources West companies used a common set of screening criteria so that we could be confident that we have a consistent approach to our understanding of options across the region. It is important to note that the capital and operating costs of a potential scheme do not form part of this initial screening stage. The common screening criteria are summarised in Table E3.

Table E3: High level screening criteria used to assess unconstrained options

High level Screening Criteria	
Option benefit	Is the likely scale of supply benefit (yield) to water companies and/or other sectors relative to the supply deficiency sufficient to proceed?
	Is the option in a location that makes deployment practicable?
	Is the option likely to be granted an abstraction licence or other necessary consent?
	Could the option offer supply / demand benefits at a regional or national scale?
Engineering risk and delivery feasibility	Is the engineering complexity such that it is highly unlikely to deliver the benefit stated i.e. is it technically feasible?
	Is the technology established with more than one example of in use at scale worldwide?
Environmental, planning and other regulatory constraints	Does the option cause unmitigable damage to a European designated site (SAC/SPA/Ramsar)?
	Does the option cause unmitigable damage to Nationally designated site (SSSI/NNR/National Park/Ancient Woodland)?
	Does the option cause unmitigable damage to Site with significant heritage or visual amenity value (e.g. Scheduled Ancient Monument or AONB)?
Political and customer acceptability	Is the option politically unacceptable such that it is unlikely to gain planning approval?
	Does it cause significant negative socio-economic impact than cannot be mitigated?

Through this process we screened out 13 supply options. The reasons for rejection are outline in table E4.

Table E4: Options screened out and reason for rejection

Option ID	Scheme Name	Feasible Option?	Rejection
HD 001	Talwrn BH refurbishment	N	Not technically feasible due to historic pollution events
HD 002	Pant Glas reservoir DO improvement	N	Not a preferred option for this source. Utilise asset as part of Environmental Destination Programme
HD 006	Dee General Direction Emergency Storage rule change	N	Option not available on further consideration
HD 007	Import from UU via Vyrnwy Aqueduct	tbc	Option feasible no offer perused at this time
HD 008	Import from SVT Whitchurch	tbc	Option feasible no offer perused at this time
HD 009	Import from DCWW (Bretton)	tbc	Option feasible no offer perused at this time
HD 010	CRT Llangollen canal transfer	tbc	Option feasible no offer perused at this time
HD 011	Coal Authority options in Wrexham area	tbc	Option feasible no offer perused at this time
HD 014	Re-commission/rebuild Legacy WTW's	N	No additional DO Resilience option
HD 017	New raw water pumping station at Legacy	N	No additional DO Resilience option
HD 018	Resilience from Clywedog Reservoir	N	No additional DO Resilience option
HD 019	Import from SVT/DCWW Elan Reservoir to Llandinam Pipe	tbc	Option feasible no offer perused at this time
HD 021	Recommission disused reservoir at Esgeraira	N	Not a preferred option for this source. Utilise asset as part of Environmental Destination Programme

We paused option development prior to detailed screening once the water resources modelling confirmed that we were in surplus across all water resource zones. However, the initial screening process provided an

opportunity to review potential resilience options and highlighted where redevelopment of disused sources would prove too costly but could provide opportunities for environmental improvements.

Currently we have identified 9 feasible options that are ready to be developed. Figure E3 illustrates the geographical locations of our feasible options (and our rejected options) and Table E5 summarises our feasible options.

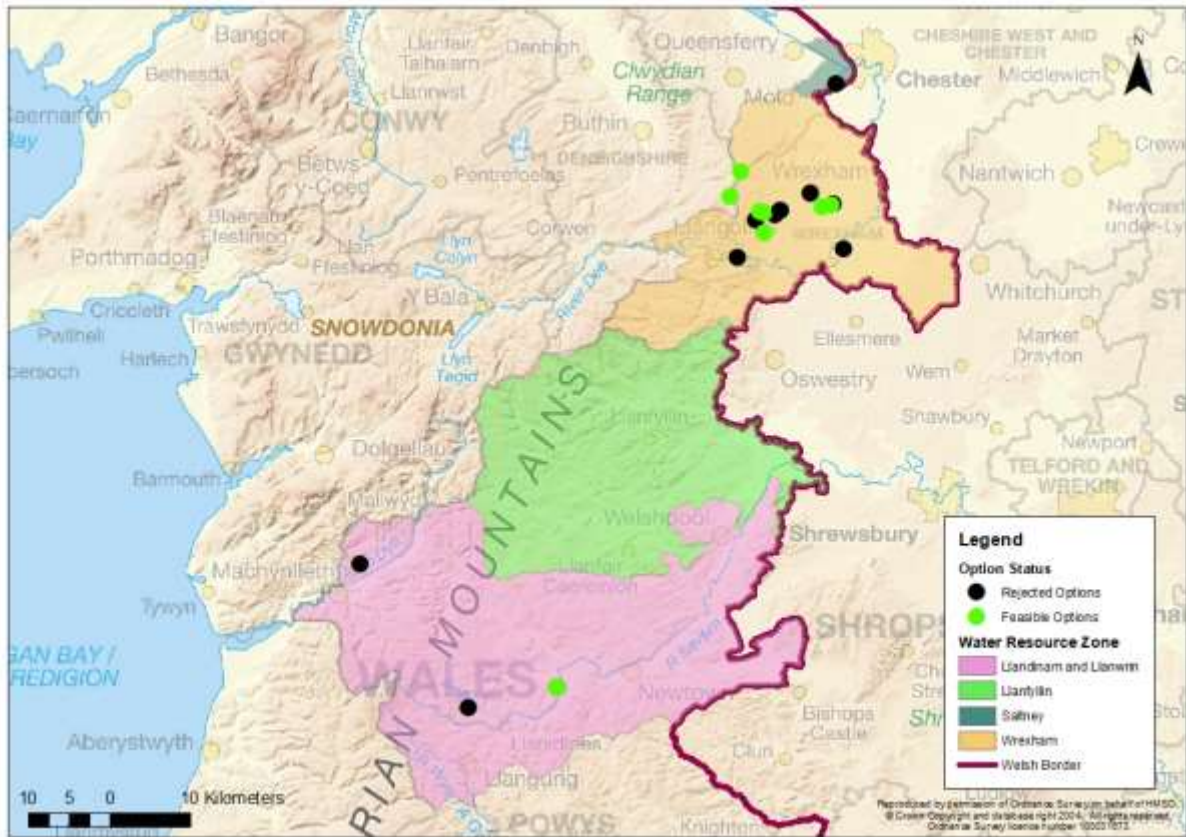


Figure E3: Location of unconstrained options

Table E5: Feasible Supply Options

Option ID	Scheme Name	Option Type	WRZ Benefitting	Estimated DO / Yield (MI/d)
HD 003	Nant-y-Ffrith IR and Pendinas IR catchment improvements	Catchment management	Wrexham	1
HD 004	Ty Mawr catchment improvements	Catchment management	Wrexham	1
HD 005	Reserving the Pen-y-cae transfer for HD	Surface water enhancement	Wrexham	0.4
HD 012	Restore capacity of Cae Llwyd reservoir	Reservoir enlargement	Wrexham	1
HD 013	Expand Llwyn Onn WTW's	Water treatment works capacity increase	Wrexham	4
HD 015	Re-commission disused source at Abersychnant	Trunk mains renewal/new	Wrexham	4
HD 016	Enhance pipework to reservoir at Marchwiell	Trunk mains renewal/new	Wrexham	tbc
HD 020	Increase Llandinam WTW output with additional raw source	Groundwater enhancement	Llandinam	2
HD 022	Llwyn Onn WTW DO Recovery	Water treatment works capacity increase	Wrexham	6

Figure E4 outlines the timeline for option development and screening process. If a deficit was forecast, we would have continued to develop the engineering feasibility of the options and assessed their impact to the environment. We would have undertaken the detailed screening (criteria is outlined in table E6) and if not rejected, continued to refine solutions for costing and develop metrics for optimising a best value plan. Table E7 details the metrics we would have developed and Figure E4 outlines the areas where we would undertake further assessment/development/refinement of our solutions.

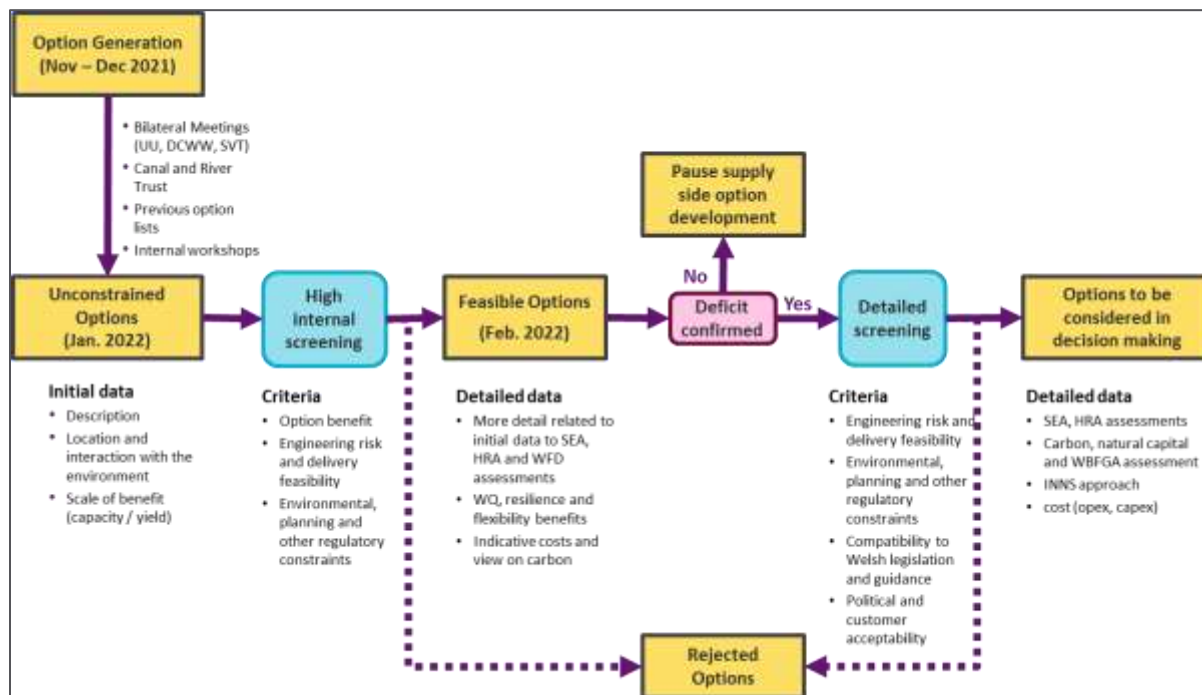


Figure E4: timeline of option development and screening process

Table E6: Detailed screening criteria for feasible options

Detailed Screening Criteria	
Option benefit	Is the scheme mutually exclusive with a lower cost, higher benefit, less damaging option?
	Is the option dependent on another option that has been screened out?
	Is the option durable / viable in the long term?
	Is the option flexible to changing circumstances in demand?
Engineering risk	Can the option be developed within the required timescale to meet the WRZ deficit
Environmental, planning and other regulatory constraints	Does the option pass HRA compliance risks?
	Does the option increase the risk of flooding that cannot be mitigated and / or is the site at risk of flooding?
	Does it breach any other legislative requirements that would render it illegal?
	Does the option transfer raw water between catchments and represent a non-mitigable INNS risk?
	Does the option transfer water of a different quality that would breach DWI guidance?
	Does the option lead to deterioration of any of the waterbodies classified under the WFD?
	Does the option meet the social and environmental objectives of the relevant SEA?
If in Wales does the option comply with Welsh Government's SMNR principles	
Political / customer acceptability	Is the option likely to be completely unacceptable to customers? eg in terms of taste and odour
	Is the option likely to be unacceptable to stakeholders?
Cost, carbon and natural capital	Capex and opex cost
	Carbon impact (embedded and operational)
	Natural capital value
	What if any is the net gain to the environment provided by the option?
	Does the option provide other resilience benefits to water companies?
	Does the option provide benefit for other sectors and is supported by them

Table E7: Water Resources West's multi criteria metrics

	Metric name	Description
1	Cost	Total NPV based on capex (initial and replacement) and opex (fixed and variable).
2	PWS drought resilience	Supply-demand balance change at 1 in 500 level (MI/d)
3	Carbon costs	Total NPV of monetised carbon cost.
4	Flood risk	Flood risk assessment from SEA converted to a numeric scale.
5	Human and social wellbeing	Air quality, climate resilience, economy, tourism and recreation, human health and well-being, cultural heritage and landscape assessments from SEA converted to a numeric scale.
6	Ecosystem resilience	Biodiversity, ecosystem resilience, INNS, soils, geodiversity and land use, waste and resource use assessments from SEA converted to a numeric scale.
7	PWS customer supply resilience	Customer valuations ("willingness to pay") NPV for supply interruptions and water quality (aesthetics and hardness)
8	Multi-abstractor benefits	Water quality and quantity, and water resources from SEA converted to a numeric scale.

Source: Water Resources West "Option Development Methodology" v2.1 05Feb 21. (WRPG = Water Resource Planning Guidelines)



Figure E5: Summary of areas for further solution development and assessment