

**OXFORDSHIRE COUNTY COUNCIL RESPONSE  
ON WATER RESOURCES CONSULTATION  
DRAFT REGIONAL PLAN FOR THE SOUTH EAST  
Consultation closing date: 20<sup>th</sup> February 2023**

## **Introduction**

1. The County Council is responding to the following consultations:
  - Water Resources South East (WRSE) draft regional plan consultation<sup>1</sup> (this response)
  - Water Resources West (WRW) draft regional plan consultation
  - Water Resources East (WRE) draft regional plan consultation
  - Affinity Water’s draft Water Resource Management Plan 24 (WRMP24) consultation
  - Thames Water’s draft Water Resource Management Plan 24 (WRMP24) consultation
2. This response on the WRSE draft regional plan follows the Oxfordshire County Council response on the emerging regional plan which was sent in March 2022 and is available on the County Council’s website with a press release<sup>2</sup>. The County Council also sent officer responses on several earlier consultative documents. Oxfordshire County Council has consistently questioned the water company attempts to progress a proposal for a strategic reservoir in Oxfordshire.

## **Key Concerns**

3. We find this consultation deeply flawed, by (i) continuing to use unrealistic and non-evidence-based assumptions about population and climate change, (ii) lack of clarity over both costs and benefits of the largest single item, abstraction reduction.
4. We regret that bill-payers seem effectively to be being asked to sign a blank cheque, with no clear cost-benefit analysis or justification behind the selection of the ‘preferred pathway’. We would expect to see a justification and cost-benefit analysis for that stronger than “expected by our regulator”. In particular, we would like clarity on the degree to which giving utmost priority to chalk streams, impacts on the continuation of daily discharges of raw sewage into the rest of the river network. This opportunity cost has either not been considered or been ignored in this and previous consultations.

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<sup>1</sup> <https://wrse.uk.engagementhq.com/>

<sup>2</sup> [Oxfordshire County Council calls for giant reservoir plan to be scrapped again](#)

5. We regard it as completely unacceptable from regulators and water companies that ludicrously outdated population projections are still being used (including in the modelled pathway). Using the 2022 ONS projections based on the 2021 census, the modelled pathway would require the entirety of population growth for the whole of England to 2050 to be located in the South East. This grossly distorts the likely range of need, muddies the waters in option appraisal and risks loading unnecessary extra costs onto fewer bill-payers. We consider it patently untrue that “the minimum growth scenario reflects the lowest ONS projections”. Calculations forward from the figures given for population and environmental improvement, and backwards from the adaptive planning pathway figures give a variety of estimates spread around the “Local Authority Plus Oxcam” scenario: i.e. the third highest. Using that figure (560Ml/d) plus the high environment/high climate arm gives 2 Bn Ml not 2.2 Bn, and the low arm 1.250 Bn Ml not 1.0.
6. Using ONS18, we get figures for the 3 arms of 1840, 1200, 785 (or peak 1915, 1275, 860 Ml/d). Given the further reduction in ONS 2022 (which if projected pro rata locally would suggest 11.3% population growth), we believe that the plan should be using the current “low” scenario as the “High Growth”, ONS18 as “Reported Pathway”, with ONS 2022 as “Low” (this gives the above figures – 140Ml/d across the board). This is shown in Table 1 below.

Table 1

		Peak	Average
	HH	1915	1840
ONS18	MM	1275	1200
	LL	860	785

7. We add to our long-term scepticism about the value of the South East Strategic Reservoir Option (SESRO), very serious questions on the early timing of the decision (effectively pre-consultation, given that it is presented as a necessary feature of any pathway, something for which we can see no justification). The UK is currently in a situation of historically high levels of uncertainty over both climate impacts and population. It is baffling that such a destructive scheme, both environmentally and in its impacts on local people, should ever have been ranked highly enough to be pre-selected, when the consultation itself notes other schemes such as the Severn Trent Transfer (STT) could deliver more water and earlier, and with greater resilience.
8. We harbour serious, deep concerns about resilience of water supplies in the time horizon out to 2040, resulting from an early reliance on the giant reservoir, which is not scheduled to complete until 2040. This crowds out much more resilient and environmentally intelligent projects for the first part of the plan. In particular, we are baffled at the reticence to prioritise the transfer of water to this severely stressed South East area from less stressed regions to the North and West. This is even more baffling when we note that all of the transfer schemes connect at least in part to water recycling schemes, giving both geographical and water source resilience and that one involves reuse of an existing reservoir in an area that would maintain or increase rainfall even in the event of Atlantic meridional overturning circulation (AMOC) collapse.

9. Of the 1,150 responses to the emerging WRSE regional plan consultation earlier in 2022, we understand that about half of the responses indicated direct opposition to the SESRO, yet this has not resulted in its removal from the draft plan. We note an increasing level of anger and resentment among sections of our local population, which has resulted in destructive and threatening behaviour within Oxford, including some directed at local politicians. We note also that the area whose residents' lives will be blighted by the environmentally destructive reservoir project is already experiencing a lot of development. As a result, we have concerns about very significant civil unrest if the SESRO project is forced onto this area.
10. Finally, we are disappointed that “best value” appears to put a very low weighting on public amenity / negative impacts on local people, environmental impacts (except where mandated by other bodies) or (re)use of existing assets. We are disappointed that the opportunity to refurbish the Cotswold Canals is proposed to be foregone; that a massively destructive reservoir in a heavily populated area has been declared “mandatory” despite evidence to the contrary; that improved groundwater abstraction and storage is not top priority; and that the use and improvement of an existing reservoir at Vrynwy has been pushed to the back of the queue.

## **Calculation of water need and policies**

### *Need calculations*

11. The South East is the most water-stressed region in England and faces bigger issues than the other four regions required to prepare regional water resource plans following a recent government guideline<sup>3</sup>: North, West, East, and West Country.
12. The WRSE six water companies together currently supply some 6 billion litres of water to customers each day. The draft regional plan estimates an additional need for between 1 billion litres and 2.8 billion litres of water per day by 2075. The ‘reported pathway’ is defined as the ‘best value way of meeting the regulatory and policy guidance’ and requires finding an additional 2.7 billion litres of water to supply per day by 2075<sup>4</sup>. This range of uncertainty is not reflected in reality, but in slavish adherence to outdated guidance. The “Low” pathway, which still reflects projected population growth double that likely under ONS 2022, would require 1Bn litres per day less, giving a “real world” range of 1-1.8Bn litres / day.
13. Oxfordshire County Council expects the water companies to plan for sufficient water supply. We recognise the absolute need to get the “right answer” and the potentially desperate consequences of failure to do so. The Oxfordshire Infrastructure Strategy (OxIS) and Local Plans in the county recognise that reliable future water supply is needed. The issue is urgent, exacerbated by historic underinvestment and the climate change emergency. However, the factor of 3 difference between low and high estimates, and their progressive drift out of ONS

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<sup>3</sup> Water Resources Planning Guideline [Water resources planning guideline - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/612122/water-resources-planning-guideline.pdf)

<sup>4</sup> Page 20 and 21 of the draft WRSE regional plan <https://wrse.uk/engagementhq.com/>

population ranges is a frankly unacceptable. Persisting in generating spurious uncertainty at this stage hampers proper scrutiny of the most likely plans, following ONS 2018 or ONS 2022. Given that the latter predicts population growth a third smaller than the former, it seems certain that the amount of additional water need being forecast is excessive. This uncertainty reflects dysfunctional input assumptions (housing plan growth) and also a current, short-term, relatively unique set of circumstances including fall-out from Brexit, Covid, and housing policies and the current rapidly evolving state of both the climate emergency and climate science.

14. The WRSE forecast water need figures are based on four drivers, comments on each are as follows:

- Population growth: The forecast used is indefensible. It is almost certain to be much too high as it is based on a housing numbers derived from local plans, all of which will be based on inflated figures, simply by the fact of being historical documents, over a period when every biannual ONS plan has downgraded population growth assumptions compared to the previous one. The choice of the 'housing plan' assumes an extra 4.5m people in the South East between 2020 and 2050, whereas the Office of National Statistics 2018 estimates an extra 1.9m people over the same period and the lowest estimate is for only an extra 0.4m people living in the area by 2050. The 2021 Census / 2022 ONS projections are for only 3.7 million extra people by 2045 in the whole of England (4.1 million by 2050, see Table 2); the reported pathway therefore requires nearly half a million extra immigrants on top of the ONS estimate, with all of them living in the South-East. Virtually the entire population of Liverpool could be imported to add the required numbers on top of population increase. These differences are further exacerbated in the WRSE plan looking out to 2075. Our view is that it is high time the industry, regulators and government sorted themselves out and stopped basing planning on anti-evidence-based nonsense. It is our reluctant view that a responsible, non-monopoly industry that did not stand to profit from overstating need would long since have rejected these figures.

Table 2:

<b>Estimated and projected population of the UK and constituent countries, mid-2020 to mid-2045</b>								
<b>Modified from Office for National Statistics - National population projections</b>								
Figures may not sum because of rounding.								
	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>	<b>2045</b>	<b>Δ2020-45</b>	<b>est 2050</b>
<b>UK</b>	67.1	68.3	69.2	69.9	70.4	71	3.9	4.5
<b>England</b>	56.6	57.7	58.5	59.2	59.8	60.3	3.7	4.1
<b>Wales</b>	3.2	3.2	3.3	3.3	3.3	3.3		
<b>Scotland</b>	5.5	5.5	5.5	5.5	5.4	5.4		
<b>N Ireland</b>	1.9	1.9	1.9	1.9	1.9	1.9		

- Environmental improvement through abstraction reduction: There should be a focus on ecologically important chalk streams and reducing abstractions to enable those environments to be rehabilitated. We would welcome a thoughtful discussion of the marginal cost and utility of moving up through the three environmental options, particularly weighed against an equivalent shift in resources to reducing raw sewage discharges in other rivers. Again, we challenge the industry to push back on the regulator's narrow focus and maximalist expectations. The water companies need to carefully calculate how much water can still be abstracted from rivers, streams and underground sources in locations which are not environmentally sensitive. In addition, the plan contains irritatingly unspecified totals for groundwater abstraction and storage; 17 schemes with order of magnitude ranges (0.5 - 5/ 0.5 - 9 Ml/d), making it difficult to assess their potential total impact. These would appear to be schemes which have low impact, high resilience, but which seem scheduled as an afterthought.
- Increasing resilience to severe drought events: The government has a target for a 1:500 year resilience level by 2040. It is accepted that the water company plans must provide for this, but the amount of water needed will be less if individual household water use is reduced and pipe leakage is reduced further from that anticipated by WRSE. Given the acceleration of extreme weather events from climate change (see below), we are extremely concerned about the wisdom of plans that take this length of time to develop resilience. By 2040, global temperatures will be well past 1.5C over preindustrial levels under any feasible emissions pathway. Given the level of extreme weather disturbance including multi-year droughts at the current 1.1C above preindustrial, we urge a complete re-evaluation and reordering of schemes to prioritise those maximising resilience. We find it irrational to contend that a vital component of resilience proposed in these plans is building a reservoir in a seriously water stressed area and hoping reliably to fill it from within that same seriously water-stressed catchment. We fail to understand how such a scheme passes "best value", never mind "least regret" calculations when set against increased recycling or transfers from out of area.
- Climate change: The escalating and unexpectedly severe impacts of climate change are a key reason to provide a more resilient water supply network. The natural world responds in a non-linear manner to temperature change and the rate of heating is likely to increase in this decade for a number of reasons. We are already seeing 1000+ year events regularly across the world. One of them, the heat dome that affected British Columbia in 2021, would have been a 1 in 150,000 year event before climate change, and will be a 1 in 10 year event at 2C. The critical resilience test will be dealing with prolonged extreme events such as a sequence of exceptionally dry winters followed by extreme droughts and hot summers. There is no sign whatsoever that the plan has considered what we believe would be the appropriate prioritisation of climate-resilient schemes (especially recycling, water transfers that include recycling, aquifer management, and, to a lesser extent, given its high power demands and environmental impacts, desalination). We see this as a fundamental flaw and regard the de facto "bet" on reservoirs delivering in the late 2030s/ 2040s as complacent, short-sighted, and backward-looking.

15. The combination of the above leads us to conclude that the plan fails adequately to address major, glaring risks for two main reasons:

- a. The first is the persistent folly of greatly overestimating population growth.
- b. The second, that of badly underestimating the pace, unpredictability and degree of climate change in the period out to 2040.

16. This leads to two serious potential errors:

- a. First, that water needs will be greatly over-estimated, and the cost of completely unnecessary infrastructure loaded onto fewer bill-payers.
- b. Second (and conversely) that there is a potentially catastrophic and difficult to quantify risk of unpredictable extreme climate-related disruption to supplies in the next two decades. If realistic water need estimates and risk-averse climate projections are used, there will be (i) less need for a significant amount of additional infrastructure, with all its associated financial costs and environmental costs including carbon costs, and (ii) a very different build-out schedule, emphasising early delivery of the most resilient sources of water (see “ResilienceMax” columns in Table 3 below).

Table 3

Water RSS resilience pathway	Current		ResilienceMax plan		Notes
	To 2035	35-75	By 2035	By 2050	
(All in Gl/d)					
Water use	0.7		0.7		Demanding and vital target
Recycling	0.05	0.162	0.212		Target "High path" #s B/F to 2035. Rapidly maximising resilience. Low regret path, as increasing reuse needed in all but low pathway.
Desalination		0.102	0.035		Using low path #s, recognising inefficiency, high power use, env problems
Transfers	0.05	0.198	0.21	0.13	Prioritising wholly/ partly recycled water sources (GUC, STT1)
Groundwater	0.018	0.0515	0.0695		Very low negative impacts (low estimate of output)
		By 2035	1.2265		Ahead of 2035 target: room for slippage, reconfiguration.

17. We have some sympathy for the industry in its attempts at prediction at the current juncture. We note that the uncertainties around both population growth and climate change are currently very great: (i) The next set of local plans, which are in development across the region, will factor in the impacts of Brexit, the pandemic, supply chain disruption from the Ukraine war and other geopolitical and climate-related realignments and the last four ONS reports have serially decreased estimates of population growth; (ii) The latest climate models suggest a wetter future for the UK and the next generation ones, plus other advances in predictive and explicative analysis, will reduce the uncertainties around likely weather patterns as well as provide much sharper understanding of the probability and nature of extreme events. However, despite the draft plan being badged as an 'adaptive plan', it does not appear to be adaptive to the changes predicted.

### Policies

18. Oxfordshire County Council sought at the emerging regional plan stage that WRSE adopt principles or policies to prefer low carbon and least environmentally damaging water supply solutions. This draft 'best value' plan does not include such policies, and indeed flies in the face of them. Over the intervening period, our understanding and concern about climate risks has greatly increased. The plan should explicitly prioritise solutions that give maximum resilience to unexpected and unpredictably severe water shortages in the short as well as medium term. Secondary to this, we repeat our preference for policies to use existing or refurbished infrastructure, followed by a preference for infrastructure which is underground, as the environmental effects tend to be limited to construction. Restorative and low-impact schemes should also be prioritised over complex engineering solutions.

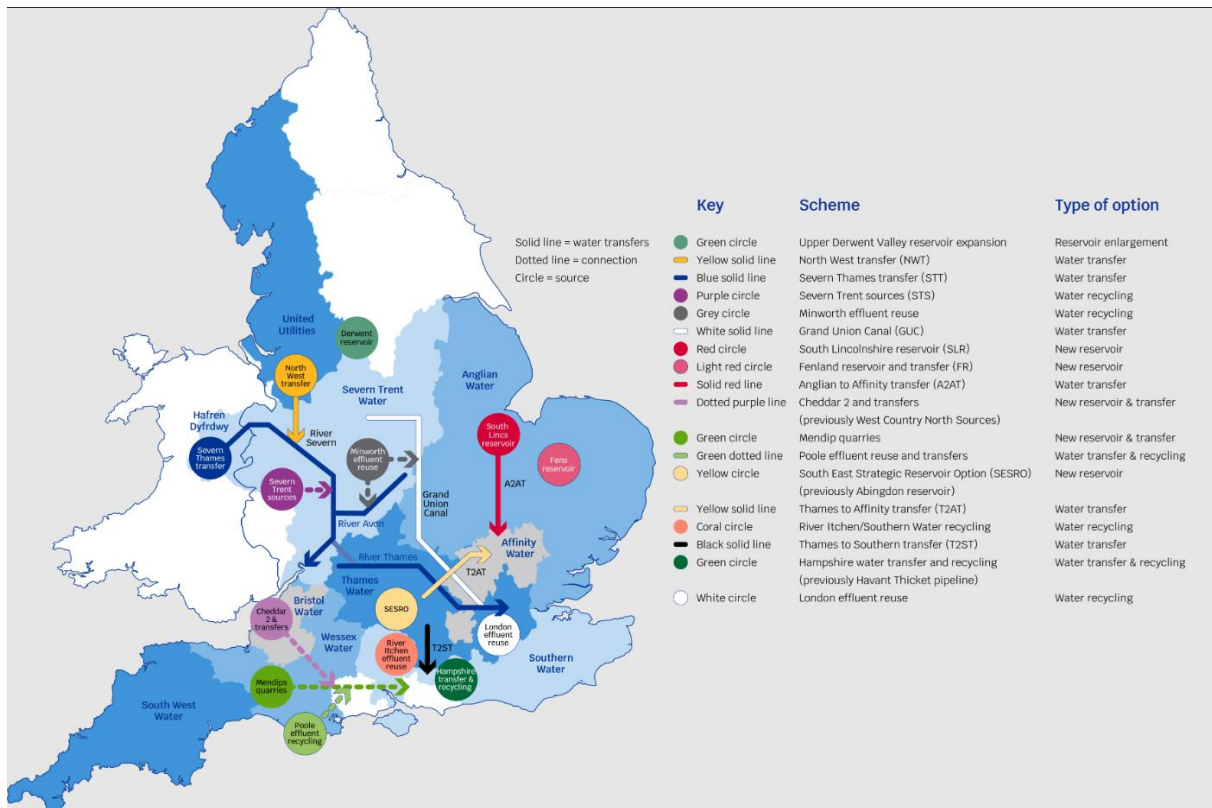
19. The consequence of not including these policies is a reliance on individual strategic resource options put forward by water companies, rather than a whole-system approach which is adaptive to change.

#### Key points above:

- The WRSE draft regional plan water need calculations are too high. All future versions should follow use the current "Low" pathway as "High", ONS 2018 as "Reported" and ONS 2022 as "Low". The "Reported" pathway then has maximum requirements at 1.7Bn litres / day requirements by the end of the period.
- The plan fails to factor in the possibility of severe disturbances to weather patterns before 2040 (by which time we would expect global average temperatures to be significantly beyond 1.5C over preindustrial). We are of the opinion that conditions of "Radical Uncertainty" strongly militate towards a "resilience first" approach.
- The plan should have policies indicating a preference for low carbon and least environmentally damaging water supply solutions.

## Strategic Water Resource Solutions

Figure 1: Strategic Water Resource Solutions<sup>5</sup>



20. Figure 1 is a diagram dated August 2022 of the strategic water resource options being considered in England. Strategic water resource options are large schemes designed to deal with more than local water needs. Submissions have been made to the Regulators' Alliance for Progressing Infrastructure Development (RAPID) as part of a gated process. The most recent submissions were made in November 2022 at 'gate 2'<sup>6</sup>. Some of these are discussed further in this response below. The gate 2 submissions listed on the RAPID website at the time of writing are:

- i. Anglian Water to Affinity Water Transfer (A2AT)
- ii. Fenland Reservoir
- iii. Grand Union Canal Strategic Transfer (GUC)
- iv. London Water Recycling
- v. Minworth Water Recycling
- vi. Severn to Thames Transfer (STT)
- vii. Severn Trent Sources (STS)
- viii. South East Strategic Reservoir Option (SESRO)
- ix. South Lincolnshire Reservoir
- x. Thames to Affinity Regional Transfer (T2AT)
- xi. Thames Water to Southern Water Transfer (T2ST)
- xii. North West Transfer

<sup>5</sup> Diagram of proposed solutions as at August 2022 <https://www.ofwat.gov.uk/regulated-companies/rapid/the-rapid-gated-process/>

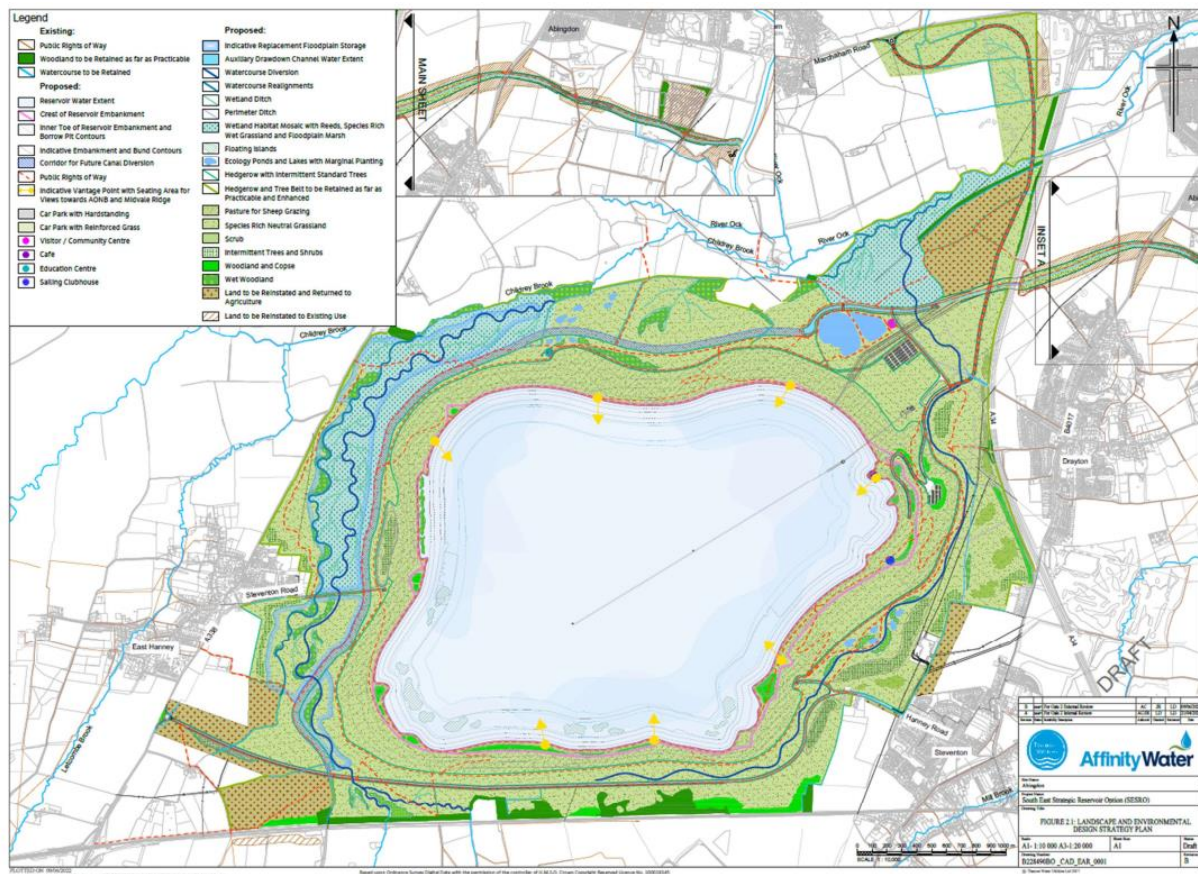
<sup>6</sup> 12 strategic water resource solution submissions at gate two are available at: <https://www.ofwat.gov.uk/regulated-companies/rapid/the-rapid-gated-process/gate-two/>



- xiii. Poole effluent recycling and transfers (not available online at the time of writing)
- xiv. Cheddar Two Reservoir (not available online at the time of writing)

## The South East Strategic Reservoir Option (SESRO)

Figure 2: SESRO 150 Mm<sup>3</sup> Indicative masterplan<sup>7</sup>



### Size

21. Figure 2 is an indicative masterplan for the South East Strategic Reservoir Option (SESRO) taken from the gate 2 main report lodged with the Regulators Alliance for Progressing Infrastructure Development (RAPID) on 14<sup>th</sup> November 2022. The indicative masterplan is for a bunded reservoir capable of holding 150 million cubic metres (Mm<sup>3</sup>) of water. It would be located, as shown on the figure, between East Hanney, Steventon, Drayton, Marcham and Abingdon and cover an area of almost 7 km<sup>2</sup>.

22. The draft WRSE plan sets out proposals for a SESRO in each of three alternative defined 'pathways' at a size to hold 100 Mm<sup>3</sup> of water. This size is less than that

<sup>7</sup> Indicative masterplan as shown on page 10 of the Gate 2 SESRO main report available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/SESRO-Gate-2-Main-Report-FINAL.pdf>

in the emerging plan consultation earlier in 2022, and the size on which the gate 2 reports to RAPID were prepared in respect of, where 150 Mm<sup>3</sup> was referred to.

23. As the only drawings available for SESRO are those based on the 150 Mm<sup>3</sup> size, it is not known what the effect of the reduced size now proposed will be in respect of the concerns set out below, although the possibility of some reduced effects is welcome.
24. At 100 Mm<sup>3</sup> this remains the largest reservoir being proposed anywhere in the country and the scale is of concern. The next largest are The Fens and South Lincolnshire proposed reservoirs in the Water Resources East (WRE) area, discussed later in this response, which are both identified for 55 Mm<sup>3</sup>, but are sited in areas with very low population density. The other five new reservoir proposals in the WRSE area are comparatively small.

### Effectiveness

25. The 100 Mm<sup>3</sup> reservoir is to be designed to provide for up to 185 Ml/d of water into the network, partly via pipeline and partly via return to the River Thames and subsequent abstraction. (The option of a 150 Mm<sup>3</sup> reservoir has been referred to as providing for up to 270 Ml/d of water.)
26. Reservoirs such as this fill in the winter and are used in the summer. This reservoir will not be able to be filled during periods of prolonged drought which continue through a winter. At times the reservoir could be rapidly emptied. The SESRO is therefore unlikely to be able to reliably provide a source of water and be an effective option in terms of resilience to future drought.

### Time to construct

27. We are extremely concerned that the opportunity cost of the water companies making an early choice for this massively destructive prestige project, is that risks to water supplies remain at unnecessarily high levels throughout its development, as it “crowds out” multiple smaller, and / or much more resilient, more diverse, more rapidly deliverable schemes. This can be clearly seen in the schedules, where highly resilient, low environmental impact recycling, natural enhancement and transfer schemes are delayed or scheduled almost at random. We note a global trend towards unexpectedly severe events, sometimes over multiple years. We note the expected acceleration in global temperature rises through this decade and the Radical Uncertainty associated with the departure of our Earth system from any conditions in recorded human history.
28. A Development Consent Order (DCO) needs to be sought through the National Strategic Infrastructure Project (NSIP) process and, should consent be granted, construction will then commence. The SESRO project delivery plan<sup>8</sup> anticipates baseline survey work and EIA scoping in 2023 leading to a DCO being awarded in

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<sup>8</sup> See F-1 Project Delivery Plan for SESRO <https://affinitywater.uk.engagementhq.com/strategic-resource-options>

2028, construction commencing on site in 2029 and continuing to around 2037 with the project completed and commissioned by 2038.

29. Given the complexity of the consent process, the need to purchase land, likely opposition to the proposal, and the lengthy construction timeline, the SESRO does not offer an early solution to water supply issues. Indeed, the water companies could have their time and financial resources inappropriately directed to this project when other options could more quickly and sustainably meet the need for future water supply.

#### Completion date

30. The WRSE draft plan requires the SESRO to be built ready to provide water from 2040. Given the consent process and construction time, this means that a very early decision must be taken to proceed with this massive project, and therefore the plan is not adaptive or responsive to change on this point.

31. The 2040 completion date also means that the SESRO will have a higher carbon footprint than if it was constructed at a later date, because the national electricity network has not yet been decarbonised, and construction vehicles will still be petrol or diesel powered.

#### Environmental Effects

32. The SESRO is located in an area adjoining two settlements (East Hanney and Steventon), and in close proximity to other settlements (e.g. Drayton, Marcham and Abingdon) and therefore will impact on many more people than more rural reservoirs.

33. Oxfordshire County Council has formed some views on the SESRO over the several years that it has been proposed. In addition to concerns about the carbon footprint, including the embodied carbon of construction materials and activities, environmental concerns include:

- Significant disruption in the area due to construction effects over a long period.
- Impacts on the landscape e.g. as a result of bunds of 15 to 25m above ground.
- Impacts on the amenity of those living nearby.
- Impacts from traffic including congestion and air quality issues.
- The need for active travel and public right of way connections.
- Whether it is possible to create and use a railway siding to reduce road impacts.
- How the Hanney Road / Steventon Road will be diverted.
- Impacts on flood risk.
- Water quality including potential for algae growth.
- Impacts on archaeology.
- Impacts on biodiversity.
- The level of biodiversity net gain to be provided for.
- How recreational benefits would be secured.
- The potential to replace existing solar farms on the land.
- The high cost of the reservoir and associated pipeline transfers.

34. These environmental effects mean that obtaining a Development Consent Order for the SESRO through the NSIP process run by the Planning Inspectorate should be difficult to achieve.

#### Cost to construct

35. The SESRO cost report indicates that the SESRO would cost approx. £1,244m to construct<sup>9</sup>. Transfer pipelines to Affinity Water and Southern Water would cost an additional £368m to £455m<sup>10</sup> and £340m to £590m<sup>11</sup> respectively.

36. The huge cost of the SESRO and the related pipelines (some £2 billion) is disproportionate to other lower cost options. The opportunity cost in failure of resilience both during and following construction is also vastly higher than any project costs.

#### Ongoing operation costs

37. Although the SESRO is reported by the water companies as having lower running costs than some other options, it will have ongoing operation costs such as for pumping water and maintaining the facilities. A full examination of the ongoing operation costs is likely to show that the SESRO is not a good option compared to many other options. It is not clear, for example, that the ongoing costs of maintaining facilities at the reservoir have been fully accounted for.

#### Lack of clarity on how the water will be shared

38. The SESRO is a joint proposal from Thames Water and Affinity Water. Operating decisions on how the water would be shared are not clear.

39. The SESRO proposal involves a pipeline for some 3km from and to the River Thames at Culham from where the water will be abstracted at times of high flow and returned to be re-abstracted closer to London for Thames Water customers there.

40. The proposal has in the last few years, also been identified to serve Affinity Water customers in London, with a pipeline further east on the River Thames. This transfer is known as the Thames to Affinity Transfer (T2AT) and is anticipated to provide for up to 100MI/d. The gate 2 documents submitted in November 2022 indicate that the likely location of a pipeline between the River Thames and the

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<sup>9</sup> Base capital cost in Table 2.1 of SESRO cost report <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/A-2---SESRO-Cost-Report.pdf>

<sup>10</sup> Cost in Table 3.1 of A2a-T2AT cost report <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/water-transfer-from-thames-water-to-affinity-water/gate-2-reports/A2a--T2AT-Cost-Report-LTR.pdf>

<sup>11</sup> Costs in Table 2.1 and 2.2 of T2ST cost report <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/water-transfer-from-thames-water-to-southern-water/gate-2-reports/T2ST-Gate-2-Annex-A4---Costs-and-Carbon-Report.pdf>

Affinity Water area dependent on SESRO, would be from a location near Slough, travelling then 14km north to the Harefield area.

41. More recently, a proposal has been developed to transfer water south in a pipeline starting at the pumping station for the reservoir i.e. near Drayton on the west side of the A34. A new water treatment works would also be located here to treat the water prior to transfer. This transfer is known as the Thames to Southern Water Transfer (T2ST) and is anticipated to provide the Southampton area with up to 120 Ml/d. However, such a transfer would not normally be required, instead the pipeline would normally only be operated at a minimum flow<sup>12</sup>. This 50-mile carbon intensive construction, designed only for occasional use running from the centre of England to a sea port begs the question of how it can possibly be seen as preferable to local desalination. Oxfordshire County Council would also have local concerns given construction effects.
42. Thames Water has also identified potential spur connections from T2ST to provide support to areas around Newbury, Reading and Basingstoke and although these are not included in the WRSE draft regional plan, it is understood that potential will be kept under review<sup>13</sup>.
43. There is a possibility that some of the water from the reservoir might be used in Oxfordshire, if there is additional infrastructure to enable that.
44. Thames Water, Affinity Water and Southern Water customers might be seen as competing for the water. It is clearly not possible to have a transfer of 100Ml/day to Affinity Water, 120Ml/day to Southern Water and some 100Ml/day returned to the river for Thames Water customers in London all at the same time, sourced by the SESRO, given the suggested capacity is 185Ml/day.
45. Other options can be progressed to provide water elsewhere. These are discussed below in this response.

Key points above:

- Although the reduction in proposed size of the SESRO from the emerging regional plan is welcomed, the 100 Mm<sup>3</sup> size is still much bigger than other reservoirs and of a concerning scale.
- The SESRO effectiveness is queried, given that in times of drought it will be difficult to fill and rapidly emptied.
- The lengthy construction timeline means that the SESRO does not offer an early solution to water supply issues.
- The build cost of the SESRO and associated infrastructure is high.
- The SESRO will have significant and potentially unacceptable environmental effects.
- The SESRO will have ongoing operation costs, which may not have been factored in correctly.

<sup>12</sup> See Section 4 scheme operation of T2ST <https://www.southernwater.co.uk/media/7734/t2st-gate-2-annex-a3-concept-design-report.pdf>

<sup>13</sup> Paragraph 3.4.1 of T2ST <https://www.southernwater.co.uk/media/7734/t2st-gate-2-annex-a3-concept-design-report.pdf>

- The SESRO is designed to enable transfers of water to other areas in the South East, but it may be that those areas have other better options to utilise.
- Given the concerns, the SESRO should be removed from the WRSE regional plan and the company plans, and not pursued as a strategic resource option.

## Options that don't involve new infrastructure

### Reducing leakage

46. WRSE is aiming to reduce leakage by 51% between 2017 and 2050 in accordance with the 50% reduction expected by the National Framework for Water Resources 2020<sup>14</sup>. Significant water savings will be achieved from this. However, there remains scope to reduce leakage faster and by more.

47. The information provided in the WRSE draft regional plan<sup>15</sup> indicates that the leakage rate for Thames Water will still be high in 2050. With five companies in the South East, the anticipated leakage reduction between 2017 and 2050 leads to rates of between 32 and 42 litres per property per day, but for Thames Water it still leaves a rate of 66 litres. If Thames Water were to achieve a lower rate, say to the rate of the next worst company of 42 litres per property per day, there would be a quantifiable reduction in the need for new strategic water resource options.

### Reducing individual use

48. The National Framework for Water Resources 2020 required the regional water resource groups to contribute to a national ambition on average per capita consumption of 110 litres per person per day (l/p/d). The WRSE draft regional plan has an overall target of 115 l/p/d at 2050. The targets of the six companies are as follows: Affinity Water 113 l/p/d, Portsmouth Water 109 l/p/d, SES Water 106 l/p/d, South East Water 107 l/p/d, Southern Water 106 l/p/d, Thames Water 121 l/p/d. If Thames Water were to do more to help customers reduce their water use to achieve around 110 l/p/d there would be a quantifiable reduction in the need for new strategic water resource options. The other regions in England have addressed this matter in their draft regional plans as follows: West – assumes that the 110 l/p/d target will be met; East – assumes that government policy support will help reduce household per capita consumption to 110 l/p/d; North – indicates they are set to achieve the 110 l/p/d target; West Country – not yet published at the time of writing. The WRSE regional plan should be based on achieving an average per capita household consumption of 110 l/p/d.

<sup>14</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/872759/National\\_Framework\\_for\\_water\\_resources\\_main\\_report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872759/National_Framework_for_water_resources_main_report.pdf)

<sup>15</sup> See page 26 of WRSE draft regional plan <https://wrse.uk.engagementhq.com/our-draft-best-value-regional-plan>

49. In September 2022, Ofwat published a review of the water companies' environmental incentives to support more water efficient new homes. The review indicates that much more can be done by companies<sup>16</sup>. Reducing the average household use of water by a substantial amount quickly can be achieved through a combination of factors; our comments on some factors are below:

- Accidental leaks within properties: Leaks will be reduced through better detection of such, and support for fixing such leaks. There is scope for water companies to do more, for example by supporting a take up of smart water meters to help to detect accidental leaks.
- Products that use less water: The government has recently carried out a consultation aimed at mandatory water labelling<sup>17</sup>. There is scope for water companies to do more, for example by providing information about and supporting the use of the most water efficient taps, showers, toilets, dishwashers and washing machines.
- Regulation to ensure that new homes and retrofits are built with the most water efficient appliances: There is scope for water companies to do more to lobby government to bring about measures such as tighter water efficiency requirements in building regulations.
- Innovative garden towns and other strategic developments: There is scope for water companies to support more innovation, for example with developments having a circular water strategy with water being cleaned, recycled and reused within the development.
- Water butts: There is scope for water companies to help supply containers for storing rainwater for use in public parks as well as individual gardens.
- Education and information: People can change propensities to lengthy showers, deep baths, half-empty washing machines etc through the receipt of good information detailing ways in which to save water. There is scope for water companies to undertake public information campaigns.
- Tariffs: Charges structured to penalise those who use excessive amounts of water could help to reduce such demands. There is scope for water companies to investigate the potential for such structured tariffs.

50. Oxfordshire County Council is willing to play its part in helping encourage a reduction in water use and would be prepared to explore opportunities to work with local authorities and the water companies.

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<sup>16</sup> Ofwat review of environmental incentives to support more water efficient new homes  
[https://www.ofwat.gov.uk/wp-content/uploads/2022/09/Environmental\\_incentives.pdf](https://www.ofwat.gov.uk/wp-content/uploads/2022/09/Environmental_incentives.pdf)

<sup>17</sup> Government consultation on mandatory water efficiency labelling, closed 25 Nov 2022  
<https://www.gov.uk/government/consultations/uk-mandatory-water-efficiency-labelling>

## Temporary Use Bans

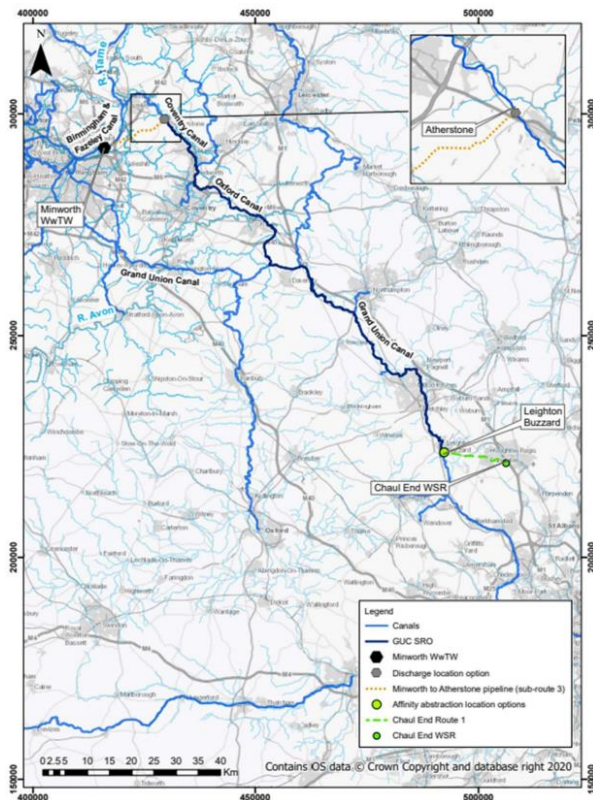
51. It can be appropriate to constrain water use at certain times, reflective of the need for behaviour change during extraordinary events. Temporary use bans, or 'hosepipe bans' can be largely accepted by the public during drought.

Key points above:

- The WRSE regional plan should require Thames Water to reduce leakage further and faster.
- The WRSE regional plan should be based on achieving 110 l/p/d on average by 2050 rather than 115 l/p/d. Additional work should be done to ensure that can be achieved, particularly in the Thames Water area.

## The Grand Union Canal Transfer (GUC)

Figure 3: Map of Grand Union Canal Transfer<sup>18</sup>



52. The WRSE draft plan requires a scheme to transfer water from the West region to the South East via the Grand Union Canal. Oxfordshire County Council strongly

<sup>18</sup> Scheme layout from November 2022 Gate Two GUC submission

<https://www.severntrent.com/content/dam/sros-gate-2-documents/guc/GUC-Gate-Two-Submission-111122-Redacted.pdf>



advocated for further consideration of this option in our response to the emerging regional plan. We are pleased that the proposed Grand Union Canal transfer has been given greater priority and an earlier start date in this draft regional plan than in the emerging regional plan where it was provided for only post-2040 and only in the high pathway.

53. The GUC scheme now involves transferring water from Minworth wastewater treatment works in the West via the Coventry Canal, Oxford Canal and Grand Union Canal to Affinity Water in the South East, supplying Affinity Water customers with up to 50MI/d by 2031 and a further 50MI/day by 2040 to 2050.
54. The detailed information available on the strategic resource option indicates that that if demand management targets are met across the South East region, the Grand Union Canal transfer is required in a phased approach. If they are not met, the full proposal providing for 100MI/day is likely to be required in a single phase<sup>19</sup>. The same information also indicates that the phased scheme would have a construction timeline of four years for the first phase and two years for the second phase, making it a relatively quick win. The proposal is said to be on schedule to go through the Development Consent Order (DCO) process and be construction ready by 2027 therefore enabling water transfer by 2031.
55. Elements of the Grand Union Canal would be upgraded as part of this, for example increasing canal bank and towpath levels at certain locations, and there would be new pipeline connections at either end.
56. The option sensibly uses an existing canal resource to get water from the Midlands to London. It is understood that the option is supported by the Canal & River Trust and there would be benefits from upgraded facilities, flood alleviation, habitat creation etc.
57. The proposed location for new abstraction and treatment facilities at the southern end is in Leighton Buzzard in Hertfordshire.
58. Severn Trent Water and Affinity Water are jointly promoting this water supply option. The route does not go through Oxfordshire. It enables Affinity Water to have a different new source of water than that from a pipeline from the River Thames i.e. the Thames to Affinity Transfer.
59. Given that the source of the water is to be treated wastewater from the Minworth Waste Water Treatment Works, it is an option which is resilient to drought because wastewater is produced and fed into the Works under all conditions.
60. Oxfordshire County Council supports the GUC proposal.

Key points above:

- The GUC proposal is supported as it brings new water into the South East, utilises existing canal infrastructure, can be constructed quickly, is

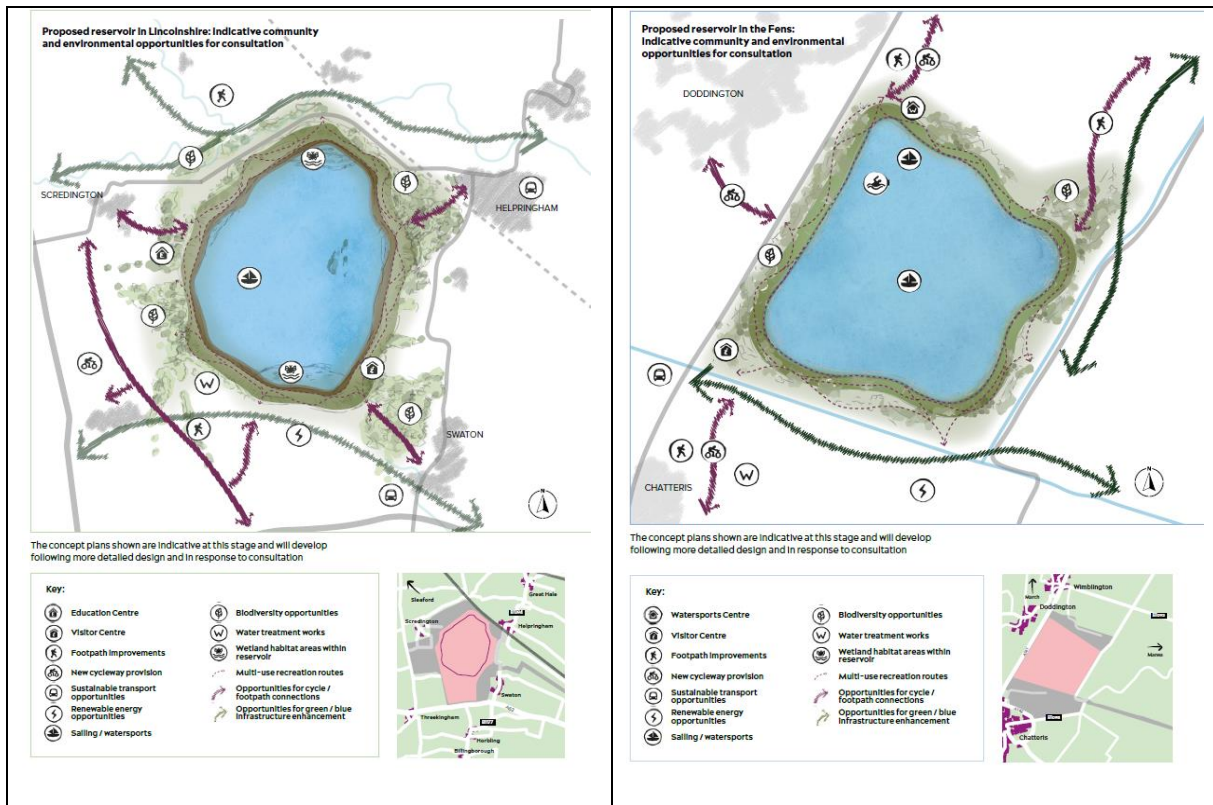
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<sup>19</sup> Information from paragraph 4.13 of GUC Gate 2 submission: [Strategic Resource Options | Affinity Water Have your say \(engagementhq.com\)](#)

resilient to drought, and is an alternative for Affinity Water to sourcing water from the River Thames via SESRO. The early timeline is also supported.

## Reservoirs in Lincolnshire and Fenland and transfers from them

Figure 4: Lincolnshire and Fenland reservoir concept plans<sup>20</sup>



61. Two reservoir proposals in Lincolnshire and Fenland have progressed significantly since the emerging Water Resources East (WRE) regional plan consultation early in 2022. The individual proposals have been subject to consultations to 21<sup>st</sup> December 2022 which include the concept plans shown in Figure 4.

62. Both new reservoirs are identified as having the capability to hold 55 Mm<sup>3</sup> of water and the sites are in rural areas. The proposed Lincolnshire reservoir location is south-east of Sleaford in North Kesteven District, the water surface area to be some 5 km<sup>2</sup>, and the deployable output some 166 Ml/day. The proposed Fens reservoir location is north of Chatteris in Fenland District, with a water surface area also of some 5 km<sup>2</sup>, but a deployable output of some 87 Ml/day.

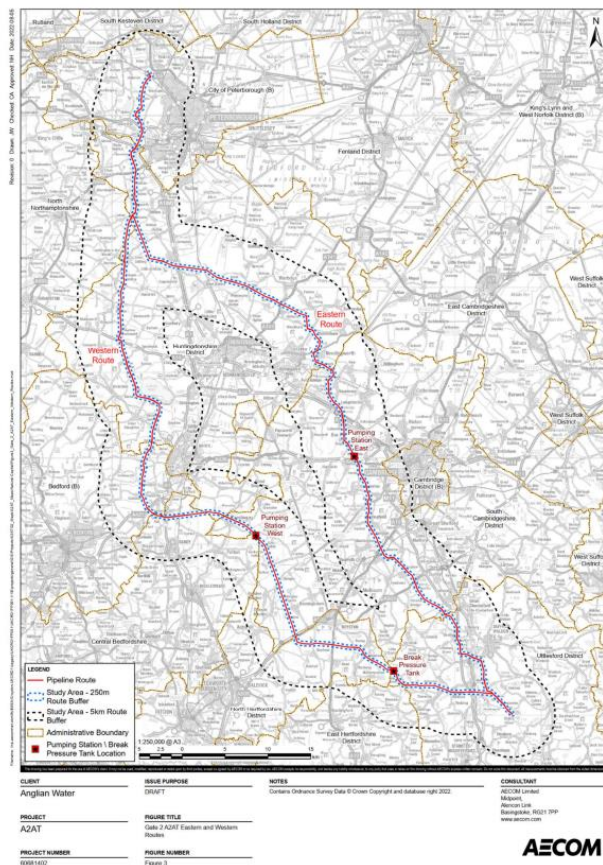
<sup>20</sup> See: <https://www.fensreservoir.co.uk/our-proposals/our-proposed-site/> and <https://www.lincsreservoir.co.uk/our-proposals/our-proposed-site/>

63. Both reservoirs are expected in the WRE draft regional plan to be in supply by 2040. A Development Consent Order (DCO) application is expected to be made in 2025 to enable this timeframe.
64. Oxfordshire County Council asked at the emerging WRE plan stage that there be a pipeline from Eastern England to Affinity Water in the South East in recognition of these new reservoirs, in particular the ability to transfer water from the Grafham Water reservoir once the new South Lincolnshire reservoir is constructed. Such a pipeline, transferring between 50 Ml/d and 150 Ml/d of potable water is reflected in the strategic resource option known as the Anglian to Affinity Transfer (A2AT) referred to in Figure 1 of this response. However, the gate 2 submission from Anglian Water made public in November 2022<sup>21</sup> makes it clear that they do not want to proceed with the option to transfer water to Affinity Water's London area. Instead, they want to keep the water in the Water Resources East region. It is therefore the intention that Affinity Water will cease to be a partner, and a pipeline proposal be developed for gate 3 only as far south as Grafham Water in Cambridgeshire. This proposal is reflected in the WRSE and WRE draft regional plans as well as the draft company WRMP24s.
65. Oxfordshire County Council does not agree with the proposal not to pursue a pipeline for the full distance. Such a pipeline would give Affinity Water another potential source of water and reduce the reliance on the schemes delivering water from the Water Resources West region and/or the SESRO. The A2AT gate 2 submission report acknowledges that a pipeline to Affinity Water would enhance the connectivity and resilience of Affinity Water's overall supply network. Two route options were considered for gate 2, a western and an eastern route, with the western, which links with Grafham Water, appearing to be favoured. Figure 5 shows the two route options.
66. The recommendation for a shorter pipeline between Peterborough and Grafham Water is estimated to cost some £276m. The full pipeline proposal had a cost estimate of some £317m to £532m and the work done to gate two indicates that the pipeline to Affinity Water's reservoir hub near Thaxted in Essex is a feasible option. It appears that cost and technical feasibility have not been the reasons for the recommendation not to proceed with the full length of the pipeline. Instead, it appears that the water companies and regional bodies have decided in favour of the SESRO and STT to help with Affinity Water's requirements rather than the A2AT. (In all cases Affinity Water also requires the GUC transfer of water.) For the reasons set out in other parts of this response, Oxfordshire County Council does not agree with the proposal to progress the SESRO. The A2AT could be part of a solution to avoid the need for the SESRO as some of Affinity Water's needs could be met from this source. The regional and company plans should be amended to provide for the A2AT north-south transfer all the way to the Affinity Water hub.

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<sup>21</sup> See A2AT Gate 2 Submission Report final <https://affinitywater.uk.engagementhq.com/strategic-resource-options>

Figure 5: Map of Anglian to Affinity Transfer pipeline route options<sup>22</sup>



Key points above:

- A pipeline should be provided for north-south from the Water Resources East area to the Water Resources South East area enabling a transfer of water between Anglian Water and Affinity Water (A2AT), to supply water from around 2040.

### Severn to Thames Transfer (STT)

67. The WRSE draft regional plan requires a Severn to Thames Transfer (STT), which is a proposal to transfer water from the River Severn in the Water Resources West region to the River Thames in the Water Resources South East region, as shown on Figure 6. By 2050 this is envisaged to provide 160 Ml/d, utilising water available in the River Severn and water from a new water recycling scheme at Netheridge. By 2060 a further 130 Ml/d is envisaged, using further water sources including the Minworth water recycling scheme and enhancements to Lake Vyrnwy in Wales. (Lake Vyrnwy is a reservoir in Wales which is functionally part of the supply system for England and the abstraction is licenced to United Utilities.)

<sup>22</sup> See Figure 3 of A2AT Natural Capital Assessment report <https://affinitywater.uk/engagementhq.com/strategic-resource-options>

Figure 6: Map showing STT elements<sup>23</sup>



68. There are two sub-options for the route of STT: a new pipeline (from Deerhurst in Gloucestershire to Culham in Oxfordshire which could provide for up to 500 MI/d); or to reinstate parts of the Cotswold Canals and augment that with pipelines (from Gloucester Dock to Culham which could provide for up to 300 MI/d). The draft regional plan indicates that it is the 500 MI/d pipeline Deerhurst to Culham which is preferred. The total of 160 MI/d by 2050 and 130 MI/d by 2060 is 290 MI/d - the 500 MI/d pipeline is stated in the November 2022 RAPID gate 2 main report as enabling only a deployable output of up to 354 MI/d on average.

69. The transfer is being jointly promoted by Thames Water, Severn Trent Water and United Utilities.

70. The STT pipeline proposal includes water treatment works at the intake locations to mitigate potential impacts on water quality or from invasive species on the River Thames. A discharge outfall structure would need to be constructed within the banks of the River Thames at Culham.

71. The emerging regional plan for the South East early in 2022 indicated a need for STT post-2040 in the two higher pathways, with the highest pathway involving a greater transfer of water. The draft regional plan requirements for STT at 2050 and

<sup>23</sup> Map from November 2022 Gate 2 main report for STT available at: <https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/water-transfer-from-the-river-severn-to-the-river-thames/gate-2-reports/STT-G2-S1-001-STT-Detailed-Feasibility-and-Concept-Design.pdf>

2060 are later than earlier thought, and it is still only anticipated in the two higher pathways, not in the lowest of the three.

72. The draft WRSE plan favours SESRO being built before STT because the STT is seen as being a 'more expensive and carbon intensive option'<sup>24</sup>. It is noted that 'if SESRO is not developed, the Severn Thames Transfer would be required by 2040, along with other additional schemes.'
73. Provision is being made for the possibility of STT being provided by 2040. The November 2022 RAPID gate 2 main report for STT indicates that STT could be construction ready by 2028 and completed in 2033 if needed. The pipeline would be a Nationally Significant Infrastructure Project (NSIP) and therefore a Development Consent Order (DCO) would be sought.
74. The cost estimate for STT is £1,270m. This is a similar cost to the SESRO cost of £1,244m.
75. It is understood that the STT pipeline is considered to be more carbon intensive than SESRO due to its ongoing pumping costs; however, electric pumping will benefit from a decarbonised grid in future.
76. It is queried whether the ongoing operation costs are higher for STT than SESRO, considering all matters such as ongoing management and maintenance.
77. Oxfordshire County Council noted in our response to the emerging WRSE regional plan early in 2022 that there are some environmental concerns with the STT pipeline. A key concern relates to the effects of construction over such a long distance, and by comparison the Cotswolds Canals option appears better given that there would be less pipeline construction and this option would use and enhance existing infrastructure. However, either sub-option would better meet policies about bringing in water to the South East and preferring underground infrastructure compared to a complex banded reservoir such as SESRO.
78. The WRSE draft regional plan eventually requires both SESRO and STT but requires that the SESRO is built first. Oxfordshire County Council considers that STT should be pursued first. As noted in other parts of this response, the SESRO should not be needed at all.

Key points above:

- The WRSE regional plan should be amended to bring forward the STT earlier.

## Water Recycling

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<sup>24</sup> See page 10 and page 28 of the draft WRSE plan <https://wrse.uk.engagementhq.com/our-draft-best-value-regional-plan>

79. The draft WRSE plan has more proposals for water recycling than in the emerging regional plan earlier in 2022. Six water recycling schemes are proposed before 2035 with a further 7 to 12 identified between 2035 and 2075.

80. Oxfordshire County Council indicated in its response on the emerging regional plan, that there are clear opportunities for more water recycling to meet future needs and supports the increased number of proposals.

## **Desalination**

81. There is one existing desalination plant in London. Only one additional desalination scheme in the Sussex Coast area is envisaged in the draft regional plan for the South East by 2035. The number of desalination schemes envisaged increases to between 7 and 14 new schemes depending on pathway between 2035 and 2075.

82. Oxfordshire County Council supports the inclusion of relatively small-scale desalination schemes as an innovative response to water supply issues.

## **Conclusion**

83. The key points noted above are repeated as follows:

- The WRSE draft regional plan water need calculations are too high. All future versions should follow variations of the “Low” pathway, with maximum requirements at 1.7Bn litres / day requirements by the end of the period.
- The plan fails to factor in the possibility of severe disturbances to weather patterns before 2040 (by which time we would expect global average temperatures to be significantly beyond 1.5C over preindustrial). We are of the opinion that conditions of “Radical Uncertainty” strongly militate towards a “resilience first” approach.
- The plan should have policies indicating a preference for low carbon and least environmentally damaging water supply solutions.
- Although the reduction in proposed size of the SESRO from the emerging regional plan is welcomed, the 100 Mm<sup>3</sup> size is still much bigger than other reservoirs and of a concerning scale.
- The SESRO effectiveness is queried, given that in times of drought it will be difficult to fill and rapidly emptied.
- The lengthy construction timeline means that the SESRO does not offer an early solution to water supply issues.
- The build cost of the SESRO and associated infrastructure is high.
- The SESRO will have significant and potentially unacceptable environmental effects.
- The SESRO will have ongoing operation costs, which may not have been factored in correctly.
- The SESRO is designed to enable transfers of water to other areas in the South East, but it may be that those areas have other better options to utilise.
- Given the concerns, the SESRO should be removed from the WRSE regional plan and the company plans, and not pursued as a strategic resource option.

- The WRSE regional plan should require Thames Water to reduce leakage further and faster.
- The WRSE regional plan should be based on achieving 110 l/p/d on average by 2050 rather than 115 l/p/d. Additional work should be done to ensure that can be achieved, particularly in the Thames Water area.
- The GUC proposal is supported as it brings new water into the South East, utilises existing canal infrastructure, can be constructed quickly, is resilient to drought, and is an alternative for Affinity Water to sourcing water from the River Thames via SESRO. The early timeline is also supported.
- A pipeline should be provided for north-south from the Water Resources East area to the Water Resources South East area enabling a transfer of water between Anglian Water and Affinity Water (A2AT), to supply water from around 2040.
- The WRSE regional plan should be amended to bring forward the STT earlier.