

Gate two query process

Strategic solution(s)	Thames to Southern Transfer
Query number	TST006
Date sent to company	16/12/2022
Response due by	20/12/2022

Query

1. Please provide more information that a SESRO 100Mm³ can support both T2ST, T2AT and local resource to SWOX WRZ. If SESRO 100Mm³ has a Deployable Output of ~185MI/d, how can it meet the demands of a 100MI/d T2AT, a 120MI/d T2ST, and local needs in SWOX WRZ. Is it due to the conjunctive use aspects of the schemes or is it due to the timing of when T2ST or T2AT are in use?
2. Related to the query above please can you provide the utilisation / operating information for T2ST including months of operation?
3. Please provide more information for the carbon assessment:
 - A section on carbon calculation methodology and indicate which policy or framework has been followed.
 - Present the consideration of scope 1, 2 and 3 carbon emissions.
 - A discussion on material selection in construction and whether the lowest carbon option has been considered.
 - A discussion on the availability of low carbon materials in the supply chain.
 - A discussion on the range and impact of uncertainties and a plan to mitigate them.
 - A plan on how to monitor the project emissions post project completion
4. Please confirm the DO for the transfer including for the Newbury spur which is included at 10MI/d but only in WRMP at 4.5MI/d. Is this due to utilisation or losses?
5. Please explain how the conjunctive use aspects of the scheme are derived in Section 6 of the CDR.

Solution owner response

1. The SESRO option is used to provide water to several zones. It is important to bear in mind that the SESRO option would be used alongside the STT option from 2049-50 onwards, and so the SESRO option yield of 184.6Ml/d does not need to provide water to all of the zones referenced above. The water which SESRO would provide, and in conjunction with STT from 2049-50 onwards would be used in the following zones:
 - London, from 2039-40 onwards
 - Affinity Water, via T2AT, with a first phase (50 Ml/d) from 2039-40 and a second phase (further 50 Ml/d) from 2044-45 onwards
 - Southern Water, via T2ST, from 2039-40 onwards
 - SWOX, from 2049-50 onwards
 - SWA (via transfer from SWOX), from 2049-50 onwards

The volume of water required in the different zones to which the SESRO and STT options could provide benefit varies over time, as demand grows/shrinks over time (due to the interaction between population growth and demand management strategies), new challenges are imposed (e.g., environmental destination), and other resource solutions are constructed to provide benefit in the many WRZs involved.

The table below demonstrates the resource balance at 2039-40, 2044-45, and 2049-50 to show that the options selected are able to provide the resource needed. This demonstrates that being able to vary option utilisation over time creates an efficient and resilient plan – key to this is that the T2AT and T2ST are not needed at their full capacities for the whole planning period, and that water is not needed in SWOX or SWA until 2049-50 (by which time the STT would be constructed to provide additional resource).

All figures in the table below are for the 'DYAA' (1 in 500-year) scenario and are consistent with the Thames Water response to query TMS-dWRMP-004.

	2039-40	2044-45	2049/50
SESRO Use	184.6	184.6	184.6
Total water from STT sources	0	0	157.4
DO Benefit from T2AT-London Conjunctive Use	25	50	50
Total Resource Benefit from West Thames options, inc. conjunctive use	209.6	234.6	392.0
SESRO/STT Water used by London (inc. conj. use)	111.5	98.9	173.7
SESRO/STT water used by T2AT	50.0	63.0	71.1
SESRO/STT water used by T2ST	48.1	72.7	69.0
SESRO/STT Water used by SWOX & SWA	0	0	59.4
SESRO/STT Water used by Kennet Valley	0	0	18.8
Total resource utilisation	209.6	234.6	392.0

- As described in Section 3 of the Gate 2 Report, 50, 80 and 120 MI/d options have been developed for T2ST (with different costs & metrics as described in Sections 6 & 8 of the Gate 2 report). The same 120 MI/d option is consistently selected by both the draft WRSE Best Value Plan (BVP) and Least Cost Plan (LCP) and consequently has been included in the draft WRMP24 of both Southern Water and Thames Water. Please refer to our response to TST005 which provides further detail on the utilisation of T2ST under different WRSE planning situations.

Further detailed water resource modelling is ongoing by Southern Water using a Pywr water resource model of the Hampshire supply area. This work will further inform the required utilisation of T2ST including monthly operation and will be reported as part of Gate 3 ‘Checkpoint 1’ in March 2024.

3. Our response to question 3 regarding carbon assessment is provided as a separate attachment. Please note that this supplementary report has not gone through formal external assurance and is therefore provided for clarification purposes in response to this query – and not as a formal part of our Gate 2 submission.

Our approach to carbon assessment at Gate 2 has been undertaken in full accordance with the ACWG methodology as included on the WRSE website. <https://www.wrse.org.uk/media/muvl5thv/acwg-low-capital-carbon-alternatives.pdf>

The T2ST carbon assessment methodology and outputs for Gate 2 are presented within Section 6.6 of the Gate 2 report and Section 6 of the Cost and Carbon Report (Annex A4).

4. As stated in our response to question 2, T2ST has been selected with a maximum transfer capacity of 120 MI/d by both the draft WRSE Best Value Plan (BVP) and Least Cost Plan (LCP) and consequently has been included in the draft WRMP24 of both Southern Water and Thames Water. We can confirm that this maximum transfer capacity at 120MI/d includes for a 10MI/d capacity spur main to the Thames Water Kennet Valley water resource zone at Newbury. Investment modelling carried out by Thames Water has confirmed that the KV spur main is required from 2040 with utilisation of up to 9MI/d by 2044.

The capacity of the KV spur has been included within the Thames Water draft WRMP at 10MI/d consistent with the WRSE BVP. We are unsure of where the 4.5MI/d capacity figure has come from but would be happy to discuss this further.

The required capacity of T2ST and spur connection to Kennet Valley has been based on the draft WRSE BVP. While the BVP has selected a 10MI/d KV spur, as discussed in paragraph 3.4.14 of the Gate 2 report, the capacity and utilisation of the spur requires further water resource modelling to confirm how it will be utilised. As stated above in point 2, further water resource modelling is ongoing by Southern Water to confirm the utilisation within the Hampshire region alongside the utilisation of this spur.

5. The conjunctive use benefit of T2ST as set out in Section 6 of the Concept Design Report has been based on Pywr water resources modelling undertaken by Atkins. We attach a copy of the Atkins modelling report (May 2022) which sets out the modelling approach and derivation of the conjunctive use benefits stated in Section 6 of the CDR and 4.2.2 of the Gate 2 Report. This work concludes that the net conjunctive use benefit of T2ST is around 48MI/d for T2ST scheme capacity of 120MI/d at a 1:500 return period. Please note that this report has not gone through formal external assurance and is therefore provided for clarification purposes in response to this query – and not as a formal part of our Gate 2 submission.

As included in section 4.2.3 of the Gate 2 Report, separate work has been undertaken to investigate conjunctive use benefits of linking SESRO with T2ST, should SESRO and STT both be constructed. This work has shown that if SESRO and STT are combined, then this could result in a net DO benefit of 19MI/d when combined with T2ST, compared to separate operation. Therefore, should both schemes be selected in the final Regional Plan, joining SESRO and STT would provide a greater level of resilience to Southern Water’s Hampshire zone.

Date of response to RAPID	20/12/2022
Strategic solution contact / responsible person	[REDACTED] [REDACTED]