Gate one query process

Strategic solution(s)	LTWLR
Query number	LTW005
Date sent to company	27/02/2026
Response due by	03/03/3036

Query

1. Is the proposed new intake at Surbiton planned to be a new point of abstraction or an upgrade [redacted]?
2. (Section 2.14) [redacted]. Is the proposed 300Ml/d for LTWLR transfer an additional 300Ml/d [redacted]?
3. (Section 2.14) 300 Ml/d is a significant scheme. Please explain how this volume has been derived in the modelling.
4. (Section 2.15) Have all permutations of connections between Island Barn, QEII and the northern reservoirs been considered on their own merits without increases to the Surbiton source? Please list which combinations have been considered.
5. (Section 2.15) Would increasing connectivity and upgrading [redacted] pumps along with other infrastructure improvements address the challenges posed without increasing abstraction?
6. (Section 2.15) Have options to extend the tunnel to further northern reservoirs been considered, and are there potential benefits enabled by this?
7. (Section 2.7 & 2.11) There are several constraints identified that are limiting Thames Water's ability to support storage at low flows. Some of these are being addressed (pump limitations through variable speed pumps and network connectivity through a tunnel solution), but other constraints are not being addressed e.g. capability to lower the outputs of the West London WTWs which are supplied by specific reservoirs only. Which options to improve these limitations been appraised as part of this project appraisal, and if so, why aren't these being taken forwards?

8. (Section 4.14) Please share the modelling outputs that show the change in loss of water following Molesey weir fish pass upgrade in 2014 and indicate how significant this driver is for the scheme. Previous infrastructure at this location was very leaky and the fish pass upgrade, including better sealed weir gates will have reduced some of this loss.
9. (Section 4.21) Please explain why the full 1:500 DO assessment hasn't been completed for this stage. Please provide an indication of any likely change in magnitude of impact under 1:500. Please also indicate the return period for this DO assessment.
10. (Section 3.3) The timing of WAFU is a couple of years before SESRO WAFU. Is the need for this scheme diminished by SESRO given that SESRO will support the northern reservoirs through augmentation?
11. (Section 3.3) Are there any short term 'quick win' options that may be brought online in the interim decade?
12. (Section3.3) Do delays from PR24 modelling diminish the value or benefit of the scheme in WRMP or Regional Plan modelling?
13. (Section 4.7) Have any measures to directly address the limited connectivity of some of the Large Process Plants been considered on their own merits, if so, which?
14. (Section 4.24) What is the triggering of the scheme based on for the assessment? Is it primarily a 'surplus' of water downstream of Walton in comparison to the TTF in force?
15. (Section 4.9) Have measures to overcome the limitations of Surbiton connectivity been assessed on their own merits without increasing abstraction rates?

Solution owner response

1. Is the proposed new intake at Surbiton planned to be a new point of abstraction or an upgrade [redacted]?

   TW response

   The proposed indicative solution at gate one is based (and costed) upon the conservative concept of a new intake (i.e. a new point of abstraction) [redacted] with new intake and screening arrangements [redacted]. This reflects the expectation that the new intake will feed into a new shaft and tunnel [redacted] However, it is expected that, as the design progresses, efficiencies may be found [redacted]

2. (Section 2.14) [redacted]. Is the proposed 300Ml/d for LTWLR transfer an additional 300Ml/d [redacted]?

   TW response

   The proposed indicative solution at gate one is based (and costed) upon a capacity of 300 Ml/d for the new intake and tunnel, which would be additional [redacted].

3. (Section 2.14) 300 Ml/d is a significant scheme. Please explain how this volume has been derived in the modelling.

   TW response

   For the modelling undertaken for gate one, the potential intake and transfer capacity was derived from the approximate additional resource availability that was observed at Teddington Weir in the 2022 drought event. This may be seen as the difference between the solid and dashed blue lines in Figure 4.1 of the gate one report. Capacities of 200, 300 and 400 Ml/d were considered, with the core optioneering and engineering concept design completed on the 300 Ml/d option. We will continue to explore the optimum capacity for the new intake, in combination with maximising abstraction at existing intakes.

4. (Section 2.15) Have all permutations of connections between Island Barn, QEII and the northern reservoirs been considered on their own merits without increases to the Surbiton source? Please list which combinations have been considered.

   TW response

   The optioneering undertaken for the gate one submission considered a wide range of configurations for improving connectivity between the southern and northern West London reservoirs (WLRs), as well as from all of the existing intakes into the southern WLRs. This included assessing multiple inter-reservoir connection options, potential enhancement of abstraction capacity at each intake, and the feasibility of a direct connection from the southern intakes to the northern WLRs.

   However, two key factors steer the optioneering towards increasing capacity at Surbiton rather than relying on the existing intake capacities in combination with additional connections between the existing reservoirs:

- Firstly, during recent drought periods the intakes for the southern WLRs [redacted] were operating at or near to their maximum available capacities, yet storage levels were still seen to decrease. At the same time, available additional flow (i.e. potential water resource) was observed in the River Thames over Teddington Weir. This indicates that relying on existing intake capacities, even with improved inter-reservoir connectivity, would be insufficient; additional abstraction capacity is required to capture this surplus resource. Additionally, the modelling undertaken for the LTWLR gate one submission assumes that all existing intakes are used to their maximum capacity.

- Secondly, [redacted] is downstream of the confluence of the River Mole and the River Thames. This tributary provides significant additional resource into the lower Thames system which would be unavailable if additional abstraction capacity were developed at the intakes further upstream. This makes Surbiton the preferred location for enhanced abstraction capacity.

Therefore, options to solely improve connectivity without enhancing abstraction capacity are not considered, as they would provide no additional water resources benefit for the existing system. However, further optimisation of the solution is expected during subsequent design stages, to explore whether a reduced capacity for any new intakes in combination with maximum use of the existing intakes, could deliver a more efficient solution overall. This could include consideration of the marginal benefit of additional intake capacity in combination with the new transfer between the WLRs.

5. (Section 2.15) Would increasing connectivity and upgrading [redacted] pumps along with other infrastructure improvements address the challenges posed without increasing abstraction?

TW response

As noted in our response to Q4, enhanced abstraction capacity is required to capture the additional 'spare' resource observed flowing over the Teddington Weir during the 2022 drought. Although [redacted] could, in principle, be connected to a new transfer tunnel to the northern WLRs, the volume available for transfer would remain constrained by the current intake capacity and would therefore be limited.

The additional resource provided by enhanced abstraction capacity at Surbiton would remain within the limits of Thames Water's existing abstraction licence.

6. (Section 2.15) Have options to extend the tunnel to further northern reservoirs been considered, and are there potential benefits enabled by this?

   TW response

   Yes. Alternative transfer routes to the other reservoirs within the northern WLRs were considered. However, these options would require longer tunnels (and hence more capital and operating costs), while offering minimal additional benefit as all reservoirs in the northern WLRs system feed into the same group of water treatment works.

7. (Section 2.7 & 2.11) There are several constraints identified that are limiting Thames Water's ability to support storage at low flows. Some of these are being addressed (pump limitations through variable speed pumps and network connectivity through a tunnel solution), but other constraints are not being addressed e.g. capability to lower the outputs of the West London WTWs which are supplied by specific reservoirs only. Which options to improve these limitations been appraised as part of this project appraisal, and if so, why aren't these being taken forwards?

   TW response

   Options associated with changes to the West London WTWs were not considered as part of this project. Although the gate one report acknowledges the operational constraints associated with these WTWs, resolving them would not change the overall system's resilience. The output of each treatment works is driven by demand; therefore, even if a particular works could be operated at a reduced flow to reduce the demand on a specific storage reservoir, other treatment works would need to increase output to continue to meet customer demand. Reducing the output of the West London WTWs is a standard response during drought. There is however a limit to which this can be done. These WTWs [redacted], which would not be acceptable.

   The critical issue is the needs to maximise the available resource and storage capacity, and to increase operational flexibility so the system can be managed effectively under the varying drought conditions. While the operational constraints at key water treatment works make day-to-day management more challenging, enabling those works to run at lower flows would not address these fundamental requirements.

8. (Section 4.14) Please share the modelling outputs that show the change in loss of water following Molesey weir fish pass upgrade in 2014 and indicate

how significant this driver is for the scheme. Previous infrastructure at this location was very leaky and the fish pass upgrade, including better sealed weir gates will have reduced some of this loss.

TW response

Hydraulic modelling undertaken by Thames Water in 2024 explored how changes to structures within the River Thames between 2005 and 2022 may have affected the river flows required to maintain minimum operating levels at key structures. These minimum operating levels act to constrain abstraction in the reaches between the structures.

For Molesey, the modelling suggested that to maintain the minimum operating level [redacted], a flow rate of [redacted] would be required. This compares to an estimated flow rate of [redacted] for the structure as it was in 2005. However, the difference between the modelled years should be treated with a degree of caution on the basis that there is lower confidence in the accuracy of the model configuration in 2005, due to some uncertainties with the survey data on which it is based.

For the gate one analysis, using the enhanced water resources model developed for the LTWLR project, this specific change has not been modelled in isolation from all other changes in the river since 2005. As a result, the impact of the changes at Molesey on Thames Water's abstraction activity cannot be estimated in isolation. The impact was identified to be one of the highest, compared with those at other structures, hence why it has been highlighted as an influencing factor in the gate one report. However, in isolation, it is not a driver for the LTWLR project. It is part of a series of influencing factors that contribute to limit Thames Water's ability to abstract all available water resources in the lower Thames system.

9. (Section 4.21) Please explain why the full 1:500 DO assessment hasn't been completed for this stage. Please provide an indication of any likely change in magnitude of impact under 1:500. Please also indicate the return period for this DO assessment.

TW response

The enhanced water resources model developed for the LTWLR project is based upon a detailed simulation of a historical timeseries of rainfall and flow for the River Thames (102 years of data from 1920 to 2022). The 1 in 500-year DO used in WRMP24 are based upon a longer-term simulation using the stochastically generated hydrological sequences to simulate a 1 in 500-year level of resilience. This is based upon 400 sequences each of 48 years of

synthetic data, so 19,200 years of theoretical hydrological data. The detailed model used for the LTWLR analysis is too complex to run efficiently for this length of timeseries.

We estimate that the return period of the current analysis is approximately equivalent to 1 in 200-years. We have validated this as the model simulation (without the inclusion of the LTWLR) provides a DO equivalent to the 1 in 200-year system DO for London quoted in section 4 of Thames Water's WRMP24[1].

The difference in the 1 in 200 and the 1 in 500 deployable output of the LTWLR cannot be estimated at this stage, due to the complexity of the supply system supplied by this option. Further modelling would be required to confirm the 1 in 500-year DO.

10. (Section 3.3) The timing of WAFU is a couple of years before SESRO WAFU. Is the need for this scheme diminished by SESRO given that SESRO will support the northern reservoirs through augmentation?

TW response

The White Horse Reservoir (WHR) SRO will provide additional deployable output into London, through augmentation of the River Thames during drought periods and abstraction of the additional flow into the WLRs. This is calculated on the basis of the current operation of the WLR system.

It is reasonable to assume that even if river flows are maintained at higher levels through the operation of WHR, the same operational issues would still be experienced during drought conditions. Thames Water would still be prevented from maximising abstraction into the northern WLRs resulting in unused resource passing downstream towards Teddington. This means the enhanced flexibility to maximise total abstraction and transfer resource between the two parts of the WLR system would still be beneficial. Therefore, even if the river flow is maintained at a higher level due to the augmentation this will not reduce the need for the LTWLR scheme.

[1] https://www.thameswater.co.uk/media-library/kwbdeukq/current-and-future-water-supply.pdf

Further modelling is planned before gate two to confirm the interaction(s) between LTWLR and both WHR and Teddington Direct River Abstraction (TDRA) SROs to verify the current understanding.

11. (Section 3.3) Are there any short term 'quick win' options that may be brought online in the interim decade?

    TW response

    It is possible that short-term, interim solutions may be available to help manage the risks until the LTWLR is operational. These may include changes to current operational practices (e.g. change flow directions of existing transfer assets) or new cross-connections between existing assets that might be more easily implemented using permitted development powers. Enhancements to existing raw water pumps that will enable greater flexibility at low flows are also in planning.

    These options are not yet defined, but work is already underway to identify any that may exist and to develop them sufficiently to understand their feasibility, cost, benefits, and risks. The findings from this work will be incorporated into gate two.

12. (Section3.3) Do delays from PR24 modelling diminish the value or benefit of the scheme in WRMP or Regional Plan modelling?

    TW response

    No. The benefits of LTWLR remain, irrespective of the delay in implementation from the estimated position at PR24.

13. (Section 4.7) Have any measures to directly address the limited connectivity of some of the Large Process Plants been considered on their own merits, if so, which?

    TW response

    To maximise the long-term benefits of the LTWLR scheme, direct connections between the existing WTWs and to the WTWs from alternative intakes have not been considered. Such connections would potentially enable some additional resource to be abstracted and passed into the WTW, when available, but this would always be constrained by the capacity of the existing works and the demand for water.

The options considered for LTWLR maximise the 'capture' of 'spare' resources as they ensure that the options link any new abstraction to existing raw water storage capacity. This means that all available resource can be abstracted, and stored for use when required, rather than being transferred direct to treatment without any storage capability. This provides additional resilience to the system.

Our large process plans are connected in their own right [redacted]. This allows us to suppress output where supplying reservoirs are low, and compensate at other sites where supply reservoir are higher. This is standard practice during drought conditions.

14. (Section 4.24) What is the triggering of the scheme based on for the assessment? Is it primarily a 'surplus' of water downstream of Walton in comparison to the TTF in force?

    TW response

    Yes. The modelling assumes that the scheme operates in any situation when the WLRs require additional resource, and there is 'surplus' resource in the River Thames compared to the TTF in force.

15. (Section 4.9) Have measures to overcome the limitations of Surbiton connectivity been assessed on their own merits without increasing abstraction rates?

    TW response

    See response to Q4 above.

Date of response to RAPID	[redacted]
Strategic solution contact / responsible person	[redacted]