Secretary of State for Environment, Food and Rural Affairs
Seacole Building
2 Marsham Street
London
SW1P 4DF

24 November 2023

Ref No: J698-AA-XXXX-TEDD-FN-ZD-100004

Dear [redacted]

TEDDINGTON DIRECT RIVER ABSTRACTION PROJECT – SECTION 35 PLANNING ACT 2008 DIRECTION REQUEST: ADDITIONAL INFORMATION REQUEST

Thank you for your response letter received 17 November 2023 seeking additional information on our request for a Section 35 Direction for the Teddington DRA (the Project), as follows:

1. **Dry year annual average deployable output figures.**

   Paragraph 6.14 details that the dry year annual average deployable output for the scheme is 67Ml/day based on three individual daily deployable outputs of 75Ml/day.

   You have stated in paragraph 6.16 that the physical scale of infrastructure required for a scheme capable of providing daily deployable outputs of 75Ml/day is the same as the infrastructure required to provide 80Ml/day which would reach the thresholds detailed in the Planning Act 2008.

   Please can you explain how you have reached this conclusion and how the dry year annual average deployable output has been determined? Including any standard, non-drought scenario output figures (e.g. the maintenance flow) that may have been used.

2. **Estimated economic impacts of water restrictions.**

   Paragraphs 6.31 – 6.36 reference figures on the estimated economic impacts of the imposition of water restrictions.

   Please can you set out clearly where the information has been derived from and clarify how the proposed scheme would mitigate this impact?

In summary to the above points, the deployable output benefit of a new scheme is the benefit which that scheme brings to the London supply system under drought conditions. We estimate that the Project would be operational for c. 90% of a drought event and hence a maximum scheme capacity or peak output of 75Ml/d gives a dry year annual average deployable output benefit of 67Ml/d. The deployable output for the Project would be the same if it were based on a 1 in 100, 1 in 200 or 1 in 500-year drought. The Project, irrespective of the deployable output, requires the same components including treatment processes, pipelines and intake and outfall structures. The size and scale of the Project, and the complexity of the environment in which the Project would be located, are not diminished by the fact the deployable output is slightly below the NSIP threshold and it is considered that the Project location, size, scale and complexity to be consistent with that of a Nationally Significant Infrastructure Project.

The economic impacts of water restrictions have been derived from a Nera Economic Consulting report Thames Water commissioned to look at the impacts of drought in London and the Thames Valley. This looked at ONS data covering different sectors as well as other related studies on the impacts of drought restrictions and the resultant impact on the economy.

These points are addressed in turn in more detail below.

1. Dry year annual average deployable output figures.

Determining the dry year annual average deployable output

Deployable output is the reliable output of a source, or a group of sources, under specified (drought) conditions. As per the Water Resources Planning Guideline requirements, Thames Water assesses the supply capability of the London water supply system as a whole, under 1 in 500-year drought conditions. Hydrological and water resource models are used to perform calculations to identify the supply capability. When defining the term “Dry Year Annual Average Deployable Output”, the words “Dry Year” reference a given Level of Service condition (i.e., a “Dry Year” could be the worst drought in historical records, or a drought judged to be of 1 in 100-year, 1 in 200-year, or 1 in 500-year severity), while “Annual Average” references the demand which can be satisfied throughout the “Dry Year” event.

The critical factor in defining London’s supply capability during drought is the storage available during these extended drought events, and how much water can be abstracted from the River Thames and the River Lee into our storage reservoirs during these extended events.

The deployable output benefit of a new scheme is the benefit which that scheme brings to the London supply system under drought conditions, i.e., the deployable output benefit is not the capability of the scheme but the added capability that that scheme brings to the wider system.

As such, calculation of the deployable output benefit of the Project requires consideration of how the Project helps maintain storage levels in Thames Water’s reservoirs.

A scheme which is on 100% of the time will deliver approximately 1Ml/d of deployable output benefit to the London Water Resource Zone per 1Ml/d capacity, as each 1Ml/d will improve our storage position by 1Ml each day.

This Project is a drought scheme and therefore would not be operational all the time. We have used our modelling tools to identify the additional customer demand that would be supported in London during drought events and concluded that, at maximum scheme capacity or peak output of 75Ml/d, an additional 67Ml/d of demand in London could be supported. Interpretation of outputs from our modelling show that the Project would be on for c.90% of a drought event and hence a maximum scheme capacity or peak output of 75Ml/d gives a dry year annual average deployable output benefit of 67Ml/d. The deployable output for the Project would be the same if it were based on a 1 in 100, 1 in 200 or 1 in 500-year drought.

While the Project is likely to operate in a maintenance mode when not fully operational, this mode does not result in any benefit to London’s storage (or, therefore, deployable output benefit) as London’s reservoirs are generally full outside of drought conditions, and so there is no additional abstraction when in a maintenance mode. Whilst the Tertiary Treatment Facility will continue to treat a small proportion of the final effluent at Mogden in its maintenance mode, and so achieve a higher degree of treatment for that amount of final effluent which will provide a benefit when that maintenance flow or volume is discharged, there is no corresponding abstraction of river water.

Physical scale of infrastructure

In paragraph 6.16 it is stated that ‘*the infrastructure required for the Project is no different to that which would be required for a scheme capable of providing a deployable output of 80Ml/d’*.

The Project, irrespective of providing 67Ml/d or 80Ml/d deployable output, would require the following components to be located across three local planning authorities:

- a Tertiary Treatment Facility (TTF) to treat the final effluent to a suitable standard;
- a pipeline to convey 75Ml/d of recycled water from its source at Mogden Sewage Treatment Works to the freshwater River Thames;
- an outfall structure to discharge the recycled water in to the River Thames;

- an intake structure, upstream of the outfall, to abstract 75Ml/d of river water and provide the deployable output; and,
- an additional pipeline to convey the abstracted river water from the intake structure to the existing Thames Lee Tunnel.

Paragraph 6.16 goes on to state that '*the significance of the Project's location, its size, scale and complexity are not diminished by the fact it is scaled slightly smaller than the NSIP threshold….'*.

The size and scale of the Project is not solely determined by the deployable output. As described above, the deployable output is a calculation of the benefit a scheme brings to the London supply system under drought conditions. This is a function of the time the scheme operates and not the peak output a scheme is designed to. In the case of this Project, the peak output is 75Ml/d and is of a comparable scale, in terms of infrastructure requirements and area required, of a Project capable of providing a deployable output or peak output of 80Ml/d.

We would expect an additional process unit for the TTF to treat 80Ml/d compared to 75Ml/d; however, the structures required to accommodate the TTF at Mogden STW would not need to increase in size and the infrastructure associated with feeding the TTF, taking flow to the transfer pipeline, the conveyance pipeline to the River Thames, the kiosks and chemical storage and the outfall and intake structures would be of the same footprint if the Project were at 75Ml/d or 80Ml/d. Therefore, the overall area required for an 80Ml/d scheme would be the same as required for the 75Ml/d scheme.

The size of the pipeline proposed for the Project is a balance of planning, environmental and engineering considerations and ensures practicable distances between shafts which is primarily governed by health and safety considerations during construction, rather than the amount of water the pipeline can carry. The pipeline route is through a heavily urbanised area and land available for new shaft construction is limited, which leads to a balance between tunnel diameter and shaft spacing. On that basis our current proposed pipeline size of 1.8m diameter would be capable of transferring 75Ml/d or 80Ml/d of water.

The outfall and intake are sized to discharge and abstract at a peak of 75Ml/d respectively. The components of these structures would all be required for a scheme capable of providing 80Ml/d, for example the same number of fine meshed fish screens would be required for a 75Ml/d scheme or an 80Ml/d scheme. We estimate that to design these structures to meet a need for 80Ml/d would not increase the physical land take of the structures as we would need to only increase the wetted depth to accommodate for the small additional flow.

Therefore, the size and scale of the Project, and the complexity of the environment in which the Project would be located, are not diminished by the fact the deployable output is slightly below the NSIP threshold and it is considered that the Project location, size, scale and complexity to be consistent with that of a Nationally Significant Infrastructure Project.

2. Estimated economic impacts of water restrictions.

In October 2022, Thames Water commissioned Nera Economic Consulting (Nera) to undertake an Economic Assessment[1] of the impact of a drought order in London and the Thames Valley, identifying the economic and social impacts of restrictions on water usage and placing a monetary value on them.

Nera looked at data on Gross Value Added (GVA) covering all sectors of the economy and extracted parameters from other available literature to estimate a percentage of output lost in the event of a drought order, considering that some businesses abstract their water privately, and some businesses place different degrees of reliance on continuous water supply. Sources of information for the report included NERA (2006) "*The cost of water use restrictions – A report for Thames Water*"; Vivid Economics for Defra (2012) "*Economic impacts of Drought in England*"; AECOM for EA and Defra (2015) "*Strategic Water Infrastructure and Resilience*".

[1] Nera Economic Consulting Economic Assessment of the Impact of a Drought Order in London and the Thames Valley Oct 22

Nera considered scenarios for drought restrictions lasting one month, three months and six months. For a Level 3 Non-essential Use Ban (NEUB) that lasts one month, the estimated daily output loss ranges from £7.17 million to £36.99 million, if this extends to three months it is £13.20 million to £73.65 million, and for six months it is £18.38 million to £78.83 million. As this drought order would be applied in the context of ongoing Level 2 restrictions, one should consider the marginal additional cost to businesses of a NEUB which would be the difference between Level 3 and Level 2 estimates.

Table 3. Estimated Gross Value Added Loss for Businesses

Scenario analysis of daily GVA loss due to drought London & Thames Valley (£ Million)			
	Drought restriction duration (months)		
Drought restriction severity level	**1**	**3**	**6**
Level 2 (TUB)	(7.17 - 36.99)	(13.20 - 73.65)	(18.38 - 78.83)
Level 3 (NEUB)	(9.27 - 60.89)	(15.37 - 75.82)	(20.58 - 83.67)
Level 4	(142.26 - 246.44)	(229.16 - 333.34)	(261.26 - 365.44)

Source: NERA

Calculations are based on GVA data accessed from the ONS. Nera formed estimates on the percentage impact of drought on GVA by industry. This required that they considered the severity of the drought restrictions, the duration of the drought restriction and the share of business users that abstract their water privately.

The GVA data is available for different industrial segments, as characterised by Standard Industrial Classification (SIC), and for different regions by International Territorial Levels (ITL) region which allowed Nera to form estimates applicable to this context. However, the ITL regional borders are slightly different to those of Thames Water's service area, so Nera applied an assumption on the share of GVA of each ITL3 region that is part of Thames Water's service area (London, Oxfordshire, Buckinghamshire, Berkshire, West Surrey, North Hampshire, Wiltshire and Gloucestershire).

Nera based the percentage impact estimates on the literature and their experience in other regions. They complemented their experience with other estimates in the literature, adjusted for the share of output lost for non-Public Water Supply businesses and applied an assumption to extrapolate the surveyed sectors to those not surveyed as well. As these estimates focus on the percent impact and are not nominal amounts, it was assumed that these percentages still hold today.

Nera then undertook an exercise to apply the percentage impact of drought on gross value added by industry by drought restriction duration and by drought restriction level to the gross value added in the data. This was then calculated as a gross value added lost per day/per industry and they then added up the different industries for a total estimate of daily gross value added lost in Thames Water's service areas for the different drought restriction scenarios.

Table 6. Total Gross Value Added and Estimates for Thames Water, per Region

Region	Total GVA (£ million)	Assumption on TW share	GVA estimates for TW service areas (£ million)
London	470 285	89%	418 554
Oxfordshire	23 453	100%	23 453
Buckinghamshire CC	15 513	75%	11 635
Berkshire	45 843	90%	41 259
West Surrey	32 071	75%	24 053
North Hampshire	15 814	25%	3 954
Wiltshire	11 357	20%	2 271
Bath and North East Somerset, North Somerset and South Gloucestershire	20 855	10%	2 086

Source. ONS GVA Balanced Approach data. Thames Water customer count and service area map.

The relationship of the Project to the findings of the Nera study summarised above and referred to in Thames Water's Section 35 request is that it will provide the water supply ability to Thames Water to realise increased volumes of water abstraction, storage, treatment and supply during temporary periods of drought to in turn offset and reduce the need for reliance upon the drought restrictions. In turn, the improved resilience that this Project provides to achieve that outcome will enable Thames Water to reduce the risk and likelihood of the financial and economic implications of water restrictions upon London.

We trust the enclosed additional information addresses the questions asked. If you require any additional information, please do not hesitate to contact me.

Yours sincerely,

Nevil Muncaster

Strategic Resources Director