Teddington Direct River Abstraction and Water Recycling Project

Site Options Consultation

J698-AA-XXXX-TEDD-FN-ZD-100002

October - December 2023

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Chapter 1
Introduction

This chapter introduces our first project-specific consultation and highlights the water resource challenges across London and how we're planning for it. We need to find a new sustainable water resource for the region or face the looming threat of severe water restrictions in times of drought .

Introduction

Welcome to our first project-specific consultation on the Teddington Direct River Abstraction (DRA) project (the Project), which is focused on site options.

This is your opportunity to find out more about our early proposals and to provide your feedback on our potential site options.

The Project forms part of a national portfolio of water resource solutions being progressed to ensure a reliable and resilient water supply is provided to water-stressed areas.

The proposals include a new abstraction on the River Thames, upstream of Teddington Weir, that's supported by recycled water. The Project is included in the Water Resources South East (WRSE) Regional Plan and Thames Water's revised draft Water Resources Management Plan 2024 (WRMP24).

Public consultation on site options

We're holding a public consultation on the site options for the Project. This follows a process we've been going through to evaluate potential sites for the structures, shafts and pipelines that we think would be required.

You can find lots more information about the Project and our site options appraisals in the following chapters.

As part of the early stages of designing and developing the Project, we want to consult with a variety of people such as landowners, residents, businesses, local authorities and other statutory bodies who might be affected by or interested in the Project to help develop the proposals.

This public consultation will close on 11 December 2023, and you can respond in the following ways:

Online: ipsos.uk/TDRA

By email: TDRA@ipsos.com

By post: Freepost TDRA CONSULTATION

If you would like a hard copy of the consultation response form, please email us on info.TDRA@thameswater.co.uk or phone our customer service helpline on 0800 316 9800.

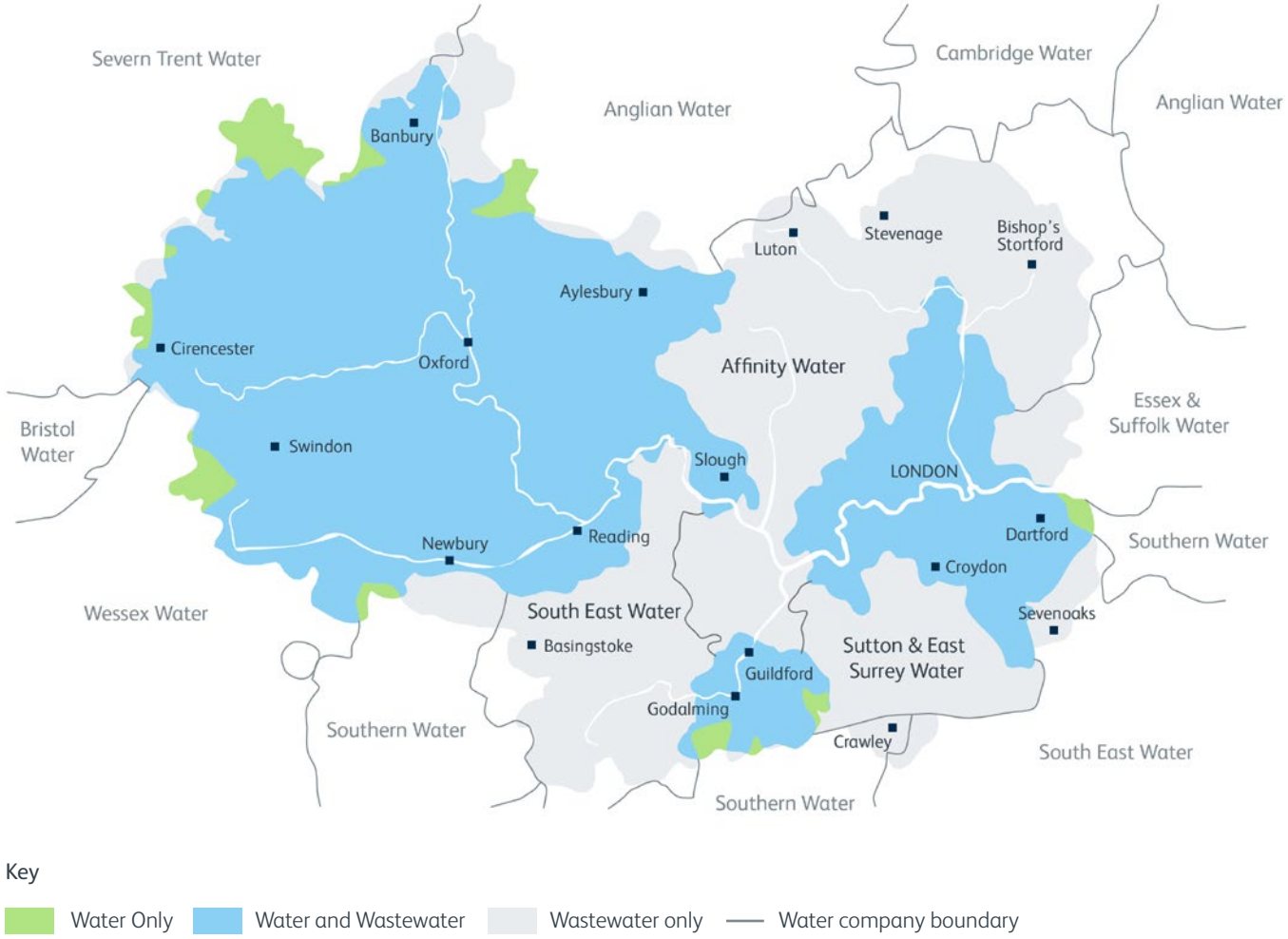
Following this site options consultation, we'll review the feedback received, and we'll consult again at a later date on the details of the Project design and preliminary environmental effects. In addition, we'll engage on technical matters with the Environment Agency, local authorities and local interest groups as we progress our studies over the next couple of years.

About Thames Water

A secure water supply is essential for public health, the environment and the economy. Water companies have a statutory duty to develop and maintain efficient and economical systems of water supply which will provide security of supply for customers.

Our water supply area extends from Cirencester in the west to Dartford in the east and from Banbury in the north to Guildford in the south and covers over 13,000 square kilometres. Every day, we supply around 2,600 million litres of water to around 10 million people and 220,000 businesses.

We take water from rivers and natural underground sources called groundwater. The process of taking water in this way is called abstraction. The Environment Agency regulates how much water we can take from the environment. We store water from rivers in large reservoirs until we need it, treating it to a high standard before distributing it to homes and businesses through our 20,000-mile network of pipes. Once it goes down the drain, we treat it again before it's returned to rivers.



Why do we need new water resources?

Our water resources are under pressure. We need to plan ahead to manage a growing population, changing climate and increasing drought risk as well as to make sure we can protect our environment. The south-east of England is classified by the Environment Agency as 'seriously water stressed'.

London and the Thames Valley is already one of the most densely populated parts of the country and the number of people living and working here is forecast to grow significantly.

Our climate is changing, and we're facing hotter and drier summers which means there will be less rain when we need it most resulting in more frequent droughts. In severe droughts water restrictions could see us rationing water for everyday activities. This could last months, not only disrupting communities but also harming the local environment and damaging the economy.

The Thames Valley is home to over 20% of the UK's chalk streams and it's our responsibility to ensure our operations don't significantly impact these precious and unique environments.

We plan to reduce abstraction in these vulnerable areas to help protect the environment.

We've developed a long-term plan which sets out the actions and investment needed to ensure we have a resilient and sustainable water supply for the next 50 years. This plan is called our Water Resources Management Plan 2024 (WRMP24) which we revised and issued in draft to the Secretary of State for the Environment, Food and Rural Affairs at the end of August 2023. The revised draft WRMP24 sets out the need to tackle leaks from our network and customers' pipes; use water wisely and reduce usage to 110 litres per person per day by 2050; and invest in new sources of water.

Our revised draft WRMP24 sets out the need for the Project and alternatives. This was subject to consultation in early 2023.

How we plan for the future

Making sure we have a reliable supply of water takes careful planning and co-ordination nationally and regionally.

Through WRSE, we've been working closely with the five other water companies in the south-east to develop a regional plan to address our region's future water challenges. The Regional Plan examines a range of new supply options including water recycling, water transfers, desalination, reservoirs, groundwater storage and sharing water between companies.

The outputs from the Regional Plan have been reflected in our revised draft WRMP24 which we consulted on earlier this year. It's clear we're facing significant challenges. While we don't know exactly what the future holds, we do know we need to get started on planning new infrastructure as the process could take 10 years to progress through planning and construction before we can provide additional water for anyone to use.

The Project

Our revised draft WRMP24 sets out the requirement for a new river abstraction just upstream of Teddington Weir with water taken replaced by an equal amount of recycled water from new tertiary treatment facilities located at Mogden Sewage Treatment Works (STW) by 2033. This scheme is known as the Teddington Direct River Abstraction project (the Project).

The development of large water resource schemes is overseen by the Regulators' Alliance for Progressing Infrastructure Development (RAPID). RAPID is made up of the three water regulators – Ofwat, the Environment Agency and the Drinking Water Inspectorate – and was formed to help accelerate the development of new water infrastructure. RAPID assesses progress of development through a series of 'gates' until the relevant planning and procurement activities are completed. There are up to five gates in total, with Gate 3 for the Project planned for summer 2024.

You can find more detail about the Project in Chapter 2 of this document.

Consultation materials

We've put together consultation materials to help you understand our proposals at this early stage of the Project, including:

- Summary brochure
- This site options consultation document
- Book of maps
- Site appraisal methodology
- Teddington DRA site appraisal report

This consultation document is arranged in the following sections:

Chapter 1 Gives background information and explains why this Project is needed.

Chapter 2 Explains what the Project is.

Chapter 3 Provides a summary of our site options appraisal methodology.

Chapter 4 Presents our site appraisal findings and preferred alignment for the pipeline.

Chapter 5 Explains the next steps.

Chapter 6 Explains what your feedback can inform and how you can respond to the consultation.

Chapter 2

What is the Teddington DRA Project?

This chapter provides information on the Project, its components and how the Project will be constructed and operated. We're at an early stage of the process in developing our proposals. Your views on this consultation will help influence the next stages of that process.

Project overview

The Project would allow for the abstraction of river water upstream of Teddington Weir and its transfer to reservoirs in the Lee Valley for further treatment and distribution across London. There would be an equivalent volume of recycled water discharged just downstream of the abstraction to balance water levels and flows in the River Thames.

The Project could provide up to 75 million litres of water per day when water is most needed. It would only be used during periods of prolonged dry weather and when reservoir storage levels are low, such as in times of drought. It would therefore only be fully operational at certain times of the year and not necessarily every year. Outside of drought periods the Project would run in a maintenance mode. Further information on the Project operation is set out below.

The Project does not allow for the discharge of storm overflow or untreated wastewater during periods of heavy rainfall or untreated wastewater or sewage into the River Thames. The design of the Project will allow for only recycled water, treated in the new Tertiary Treatment Facility to pass through the new pipe, and then be discharged into the River Thames via the Project infrastructure at Teddington.

Alongside ensuring a resilient and reliable water supply for the future, the Project presents a number of benefits and opportunities as it utilises existing infrastructure wherever possible to minimise new land-take and environmental impacts; reduces the need for drought measures, like hosepipe bans, to be imposed; and improves water quality within the tidal River Thames because of additional treatment provided by the Project.

The Project could provide up to 75 million litres of water per day when water is most needed.

Water Terminology

Drinking water: Water that has been treated at water treatment works to strict regulatory standards, ready to supply to domestic and non-domestic customers for consumption.

Wastewater: A combination of water from homes, business and rainwater from roads and roofs that is transported to and treated at sewage treatment works such as Mogden.

Final effluent: Wastewater that has had solids removed and is treated to meet strict regulatory standards ahead of being discharged to rivers and the sea.

Recycled water: Final effluent that has been treated through enhanced treatment processes to remove further impurities to create recycled water.

Ozonation: A water treatment process that involves the use of ozone (O^3), a powerful and reactive form of oxygen, to disinfect and purify recycled water.

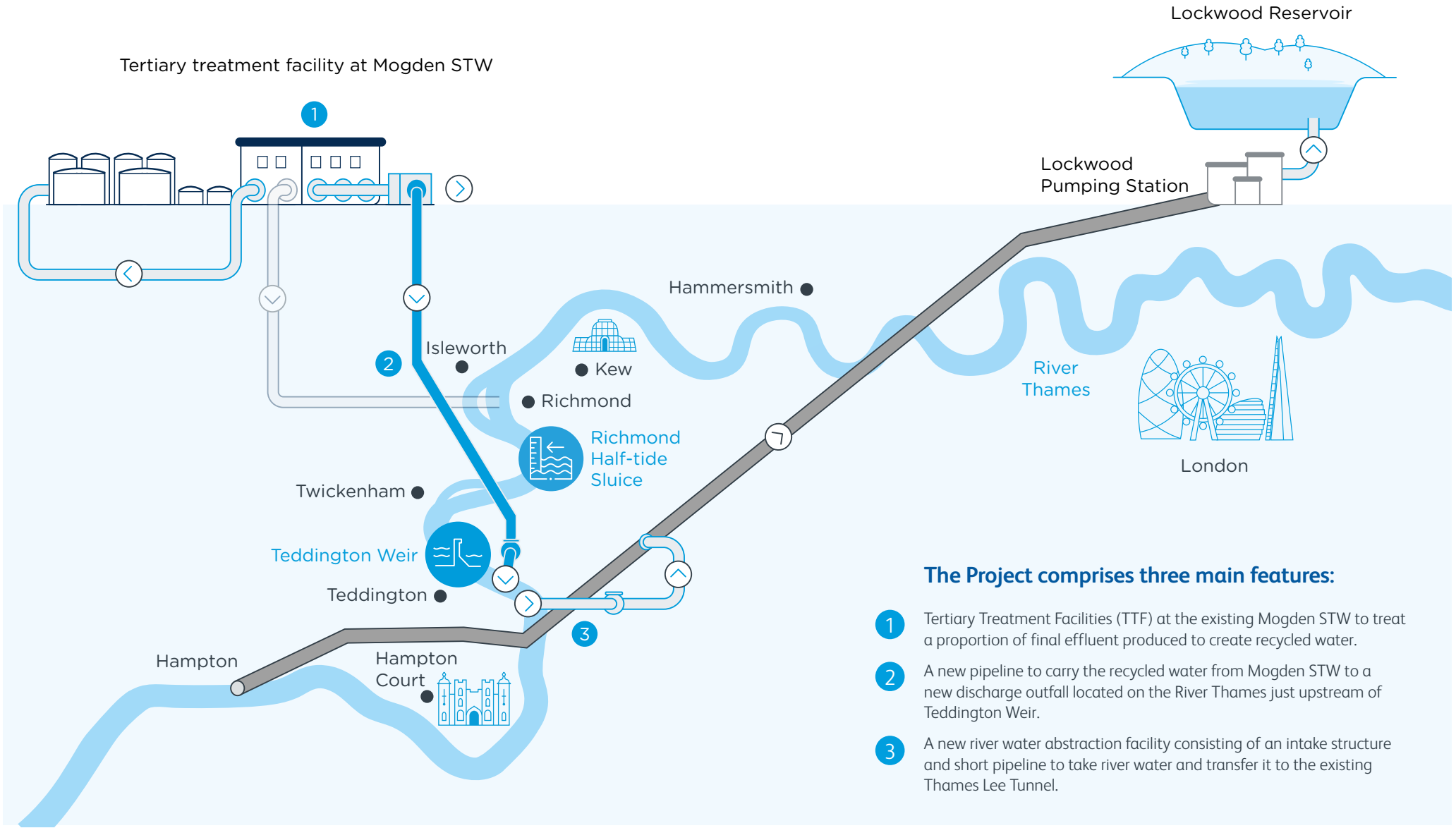
What is water recycling?

Water recycling facilities use a variety of enhanced treatment techniques to further treat final effluent from wastewater treatment works that is already permitted to be discharged to rivers and the sea, in order to create recycled water that can be returned to more sensitive environments. The level of treatment applied in a facility reflects environmental regulation, local characteristics and discharge location.

Discharging into the lower section of the freshwater River Thames means our treatment process to remove impurities would include as a minimum:

- Coagulant dosing, a process used in water treatment to enhance the removal of phosphorus, suspended particles and impurities from water.
- Treatment through nitrifying sand filters to reduce suspended particles and impurities.
- Filtration through mechanical cloth filters as a final step to further remove suspended particles and impurities.

Further treatment may be required, for example ozonation; however, as we're still at a concept design stage the requirement for additional processes is still to be tested and determined to ensure we meet our regulatory and permit requirements. Our final treatment will make sure the River Thames remains clean and safe for people to use and for wildlife to thrive. We're committed to ensuring that water quality of the River Thames is not deteriorated as a result of the Project.


Lockwood Reservoir
Tertiary treatment facility at Mogden STW
1
Lockwood
Pumping Station
Hammersmith
2
Isleworth
Kew
Richmond
River
Thames
Richmond
Half-tide
Sluice
Twickenham
London
Teddington Weir
Teddington
3
Hampton
Hampton
Court
The Project comprises three main features:
1
Tertiary Treatment Facilities (TTF) at the existing Mogden STW to treat a proportion of final effluent produced to create recycled water.
2
A new pipeline to carry the recycled water from Mogden STW to a new discharge outfall located on the River Thames just upstream of Teddington Weir.
3
A new river water abstraction facility consisting of an intake structure and short pipeline to take river water and transfer it to the existing Thames Lee Tunnel.

Project features and construction

River water abstraction facility (intake structure and pipeline)

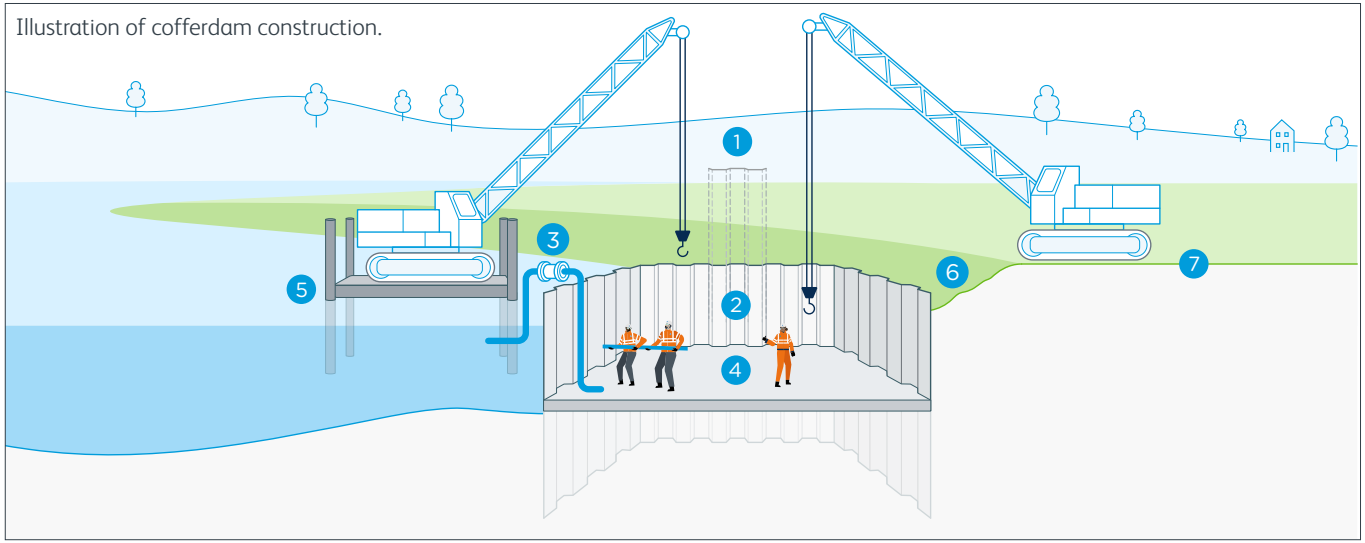
Infrastructure for the intake structure would include a bank-side platform housing debris and fish screens, pipes and pumps. It is likely to measure approximately 38m long and 3 to 4m in height above normal water level. The intake structure could be partially set into the riverbank and extend into the river by up to 3m.

To construct the intake structure it is likely a temporary cofferdam would be built out from the river bank to allow for dry excavation and construction. To install piles in the river, a barge or pontoon may also be required. It is expected that construction will last approximately 21 months in this area which will include the construction of the outfall (see section below).

A short pipeline carrying river water to the Thames Lee Tunnel would be installed underground. This would terminate in a new connection shaft, approximately 10.5m diameter and 38m deep, which will enable the abstracted river water to be put into the Thames Lee Tunnel and transferred to the Lee Valley reservoirs.

The construction technique used for the short pipeline will depend on the location of the connection shaft. Following construction of the abstraction facility, the surrounding land will be reinstated, shafts will be covered, and the area will be landscaped to soften views and create biodiverse areas.

Illustration of cofferdam construction.



1. Sheet piles pushed into the ground (river bed and river bank) to create the construction space needed
2. Excavated dry space behind sheet piles
3. Pump to dewater construction space behind sheet piles
4. Build Structure in dry space
5. Barge
6. Edge of River / River Bank
7. Existing ground level

Indicative photomontage of the intake structure upstream of Teddington Weir.

Tertiary Treatment Facilities (TTF)

To balance the abstraction of river water, recycled water would be transferred from Mogden STW and discharged downstream of the abstraction facility via a new pipeline. This would involve the treatment of a proportion of final effluent currently produced at Mogden STW to an enhanced standard through the TTF so that it meets strict environmental regulations for discharge in freshwater environments.

As the TTF will rely on using final effluent from Mogden STW, it would ideally need to be located as close as possible to the final effluent channel at Mogden STW. This would reduce the length of pipe needed to the TTF and also reduce the carbon and cost associated with pumping final effluent over greater distances.

An area within and to the south-east of Mogden STW is proposed to be utilised for the TTF and it is likely that a small area of the embankment next to the existing storm tanks on the site would be cut back and supported to create sufficient space. The final location is still to be decided within Mogden STW; however, one option could be to build the TTF on a platform over the existing storm tanks. Construction is likely to last up to 24 months in this location.

The infrastructure within Mogden STW that is required for the TTF would include:

- A pipeline connection from the final effluent channel and transfer pumping station.
- The TTF consisting of multiple process units and buildings, serviced by ancillary plant and equipment such as chemical stores, compressor units and a power supply.
- A new shaft for the start of the pipeline from Mogden STW.

Visualisation of the TTF at Mogden STW if located over the storm tanks.

View across Mogden STW toward the storm tanks and site embankment in the background.

Pipeline and outfall structure

The pipeline from Mogden STW to the River Thames upstream of Teddington Weir is proposed to be approximately 1.8m internal diameter concrete pipe constructed to depths of between 20m - 30m below ground level using techniques such as pipe-jacking, which is a form of tunnelling. This construction method and approach has significant advantages over conventional open cut excavation through urban areas as it minimises disruption and impacts above ground. The pipeline is likely to be approximately 4.5km in length starting at Mogden STW.

Along the pipeline route up to six shafts could be required depending on the route and options chosen following consultation and further design development. Shafts are required for health and safety purposes and their number is based on the length and diameter of the pipeline. Typically shafts should be sited no more than 1,000m apart for a pipeline of the size proposed and this requirement is a key factor in identifying potential shaft locations. Land around each shaft is likely to be used temporarily as construction compounds housing welfare facilities, portacabins, pumps and generators, and will be used as lay-down areas for equipment and materials. All land used as construction compounds will be reinstated following construction.

A shaft is an underground vertical passage from ground level downward used to construct a tunnel or lay a pipe. They are required to allow access of equipment during construction. The size, depth and spacing of shafts depends on a number of factors including the dimensions of the tunnel or pipe being installed and health and safety factors.

Pipejacking is a process of pushing pipe through the ground using hydraulic pistons and a boring machine. Each pipe section advances through the ground one at a time, the pistons are withdrawn to allow the next pipe section to be added to the pipe string. The process continues until the machine reaches the reception shaft at the end of the route.

Typical example of construction compound welfare facilities. This example is taken from Ham Lands in September 2023 for the Teddington footbridge refurbishment project.

Teddington Direct River Abstraction and Water Recycling Project

Typical example of a small tunnel boring machine of the size being proposed for the Project.

Example of typical flush covers to be used over shafts.
Photo credit & acknowledgement: Technocover Limited

Actual shaft cover for the Thames Lee Tunnel.

Pipeline design considerations

Installing a pipeline through open cut excavation involves considerable earthworks compared to tunnel boring. In an urban setting there would be a potential clash with existing buried utilities along the route and construction would lead to multiple road closures and re-location of communication, gas and power lines.

The ability for the pipeline to be bored at depth enables the route alignment to avoid utilities, be less disruptive and to be more direct and therefore shorter in length rather than following road alignments resulting in a longer pipeline route and more shafts. Shafts located along road alignments will result in significant disruption and require diversions leading to an increase in construction impacts. Following the road network from Mogden STW to the River Thames would result in an additional 1.5km of pipeline being required and in turn increase the amount of construction material required and excavated material to be removed.

We've carefully considered the sizing of the pipeline through the development of our concept design. The size of the pipe also dictates the number of shafts required.

We've examined bigger pipes, up to 3.5m diameter, which could result in fewer shafts (up to two shafts); however, this would give rise to:

- Pipes being overly large for the volume of water transferred.
- Double the amount of construction material being required with its associated cost and carbon impact.
- Generation of 250 % more excavated material to remove and dispose of, resulting in 200 % more HGV movements.

Each construction shaft would be approximately 10.5m in diameter and concrete lined for safe working. A tunnel boring machine would be lowered and used to bore to the next shaft along the route (these are known as intermediate shafts).

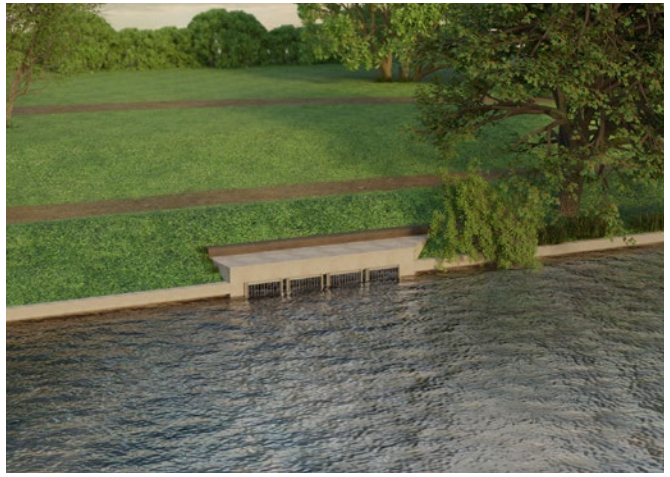
Excavated material is lifted out and transported away and pipes are continuously pushed in behind using jacks. The start point of the tunnel boring machine is known as the drive shaft and the end point the reception shaft.

It is expected that the installation of each shaft would take up to two months and the tunnel drive construction would require between 40 to 100 days per section to complete. Once complete the construction area will be removed and land reinstated.

The pipeline would end in a shaft near the outfall structure which would be set into the river bank and measure approximately 10m wide with only 4m visible. The structure is likely to be flush with the riverbank.

Construction of the outfall is likely to be similar to the intake structure with a temporary cofferdam built to allow for dry excavation and construction. Following construction, the surrounding land would be reinstated and landscaped.

After the pipeline is completed, each shaft along the route would be covered with concrete and overlayed with soil and planting where applicable. The only visible sign of each shaft following construction is likely to be two access covers measuring approximately 2m x 2m at ground level at each location.



Indicative visualisation of the outfall structure.

Operating the Project

The Project would operate during periods of prolonged dry weather and when reservoir storage levels are low. Operational periods are estimated at, on average, just under once every two years and generally between August and November when drought conditions are most likely. Even when required, operation is likely to be intermittent .

When not operational the TTF would likely be run in a maintenance mode; this is necessary to ensure the Project is ready for full operation when required at short notice. To achieve this we would likely operate the TTF with a proportion (up to 25%) of the total capacity flow throughout the year to keep it running to the required quality standards. This recycled water would then be discharged back to the environment with the Mogden STW discharge, providing improvements to the water quality in the tidal River Thames owing to the additional treatment applied to the discharge. A small proportion of this flow may also be discharged through the pipeline to the River Thames to keep the pipeline ready for full operation when required.

The Project is configured to ensure no untreated sewage or storm water overflows could be used in the TTF and therefore there is no risk of partially treated or untreated sewage passing to the river at Teddington through the Project.

The design of the Project would include a number of 'fail safe' systems that would ensure a balance of abstraction and discharge and any discharge into the River Thames meets the required water quality standards set. In the event of detection of water within the TTF coming close to not meeting the standards an automatic shutdown would occur and the recycled water would be passed back into Mogden STW for treatment. Flow to the river would not resume until testing demonstrates the required quality levels are being met again.

Did you know?

Final effluent is already discharged into the River Thames and its tributaries upstream of Teddington Weir. This is vital in keeping water flowing and wildlife thriving.

Project stage and future development

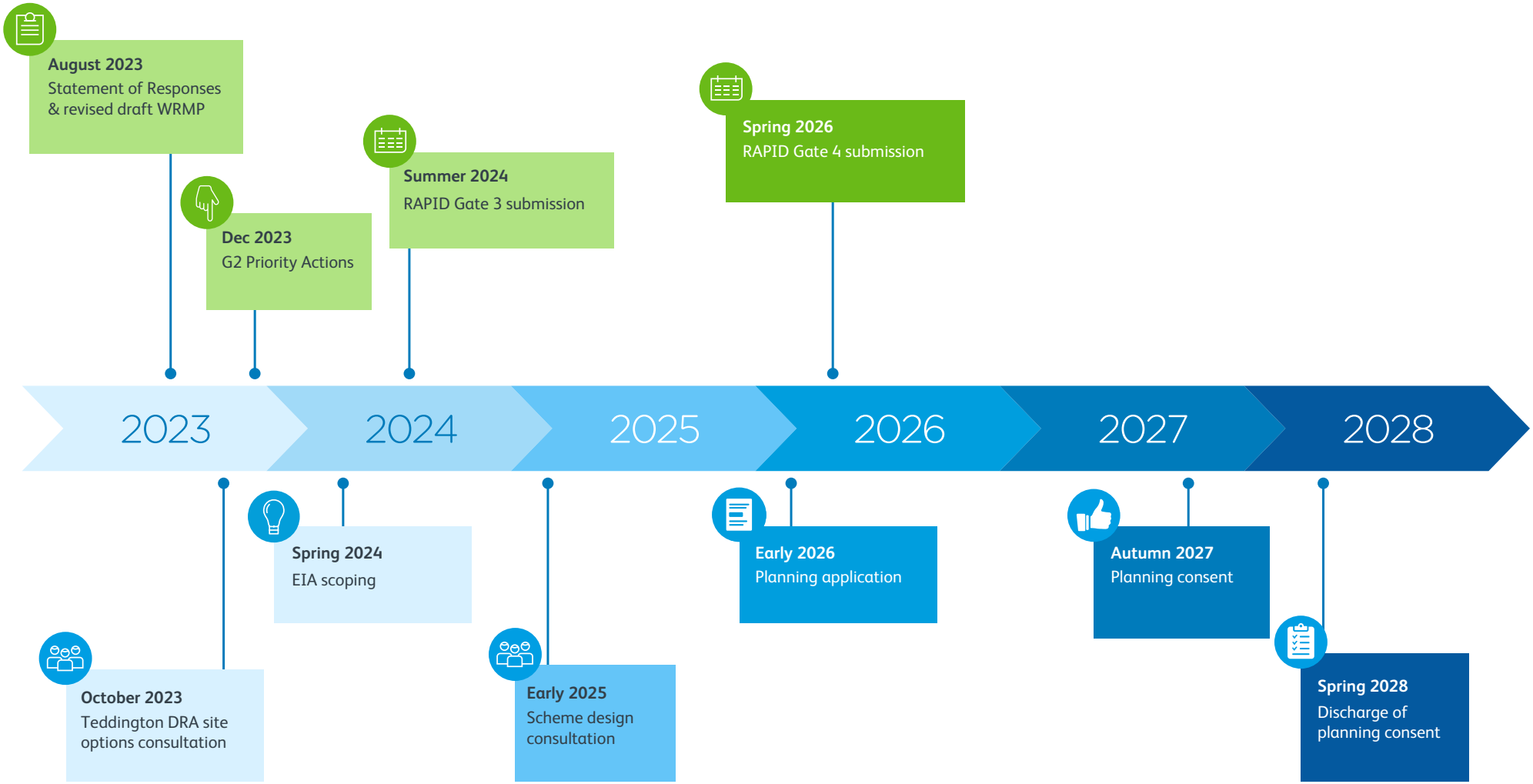
We're at a very early stage in our proposals for the Project. As part of the WRMP24 process we have appraised the feasibility of the Project and evaluated risk. We've also prepared a concept design and undertaken an initial environmental and site appraisal to meet the expectations of the RAPID gated process[1]. Now that the Project has been included in the revised draft WRMP24, we're proposing to take the Project through the planning process, which will include more detailed work on the scheme design, assessments of the environmental impact, and the development of mitigation and enhancements alongside further consultation and engagement. This initial consultation on site options marks the start of that process.

Following the close of this consultation, the Project team will combine the current concept and appraisal work with the outcomes of the consultation process. As we head into 2024 the team will then be able to begin work to confirm infrastructure sites, design details, alignment details and further develop environmental assessments.

We'll continue to progress baseline surveys in the area to provide valuable information and inform future design and assessments. You may have seen our consultants and contractors carrying out surveys within your local area over the past year and this work will continue through 2024 and beyond. The information gained from this work will help us to refine our proposals including our construction techniques and allow us to complete an environmental assessment for the Project as we move through 2025 and into early 2026.

Further information on our next steps is set out in Chapter 5 of this document.

1. www.thameswater.co.uk/about-us/regulation/strategic-water-resource-solutions/water-recycling-reuse-schemes-in-london


August 2023
Statement of Responses & revised draft WRMP
Dec 2023
G2 Priority Actions
Summer 2024
RAPID Gate 3 submission
Spring 2026
RAPID Gate 4 submission
2023
2024
2025
2026
2027
2028
October 2023
Teddington DRA site options consultation
Spring 2024
EIA scoping
Early 2025
Scheme design consultation
Early 2026
Planning application
Autumn 2027
Planning consent
Spring 2028
Discharge of planning consent

Chapter 3

Project site options appraisal

This chapter provides information on our site options appraisal methodology and establishing key design outputs from Stage 1 of the process.

Site appraisal methodology

We've developed our site options presented in this consultation through a five-stage appraisal methodology. Below is a summary of the five stages and the initial outcomes are presented in Chapter 4 of this document.

Stage 1 is represented by work that was completed to inform feasibility and an options appraisal undertaken through Thames Water's WRMP19[2] and, more recently, as part of Gate 1[3] of the RAPID regulatory process for the Project. This work identified a series of feasible water recycling schemes that could serve London. It then examined key design principles for the Project including establishing a general alignment and associated site areas likely to be necessary between the point of water recycling, the point of discharge of recycled water and the location of river water abstraction for the Project.

Stage 2 built on Stage 1 by subjecting each of the London water recycling schemes to a site level preliminary appraisal. An appraisal team consisted of experienced professionals from engineering, environmental, planning and property backgrounds compiled appropriate criteria against which each site was appraised.

A Red-Amber-Green ('RAG') grading process was applied to each criterion, and a brief commentary provided documenting the key issues that were identified. This provided an initial view on the performance of each site, the key opportunities and constraints relevant to each site and an indication as to whether any potential site should be retained, revised or removed from further consideration.

Stage 3 consisted of a workshop at which the appraisal team reviewed the outcomes of Stage 2 to agree the site options that should progress to the detailed appraisal carried out under Stage 4. Stage 3 also allowed for the identification of particular areas of concern at each site that would need mitigation and the introduction of any new sites not previously appraised.

Stage 4 built on Stage 3 by undertaking a detailed qualitative appraisal of the identified site options, applying a more detailed set of criteria topics and objectives, and considered the likelihood of securing necessary mitigation for impacts. A RAG grading was utilised again to grade outcomes.

Stage 5 of the process comprised a further workshop to consider the detailed appraisal generated during Stage 4 and identified key outcomes for each site appraised, including where possible identifying a preferred combination of sites for the Project.

We've recently completed Stage 5 of the appraisal process for the Project and have presented a summary of the findings in Chapter 4 of this document. We've also prepared a full technical report, LWR Sites Appraisal Report: Teddington DRA, which is included within the consultation material, and can be found on our website: thames-sro.co.uk/supportingdocuments.

Completion of Stage 5 of the appraisal represents our first milestone in researching, appraising and identifying our initial preferred sites that could enable the delivery of the Project.

Do you have any comments on the process we undertook to identify site options?

2. Water resources | Regulation | About us | Thames Water
3. gate-one-submission-london-reuse.pdf (thameswater.co.uk)

Key principles to the selection of options

Work carried out through Stage 1 established a number of key principles governing the potential locations for the abstraction and discharge points for the Project. These have continued to inform the Project and its site appraisal process, and include:

- Ensuring that the flow being abstracted is freshwater rather than saline water as it is going to be transferred to freshwater reservoirs.
- Seeking to minimise the overall construction demands of the Project by locating key features of the Project as close as possible to both Mogden STW and to the existing Thames Lee Tunnel.
- Locating the intake structure in sufficiently close proximity and upstream of the discharge of recycled water for the balancing of flow in the river and over Teddington Weir.
- Locating the discharge of recycled water within an area of the river where sufficient mixing of water can be achieved.
- Ensuring that the distance between any shafts along a pipeline is limited to approximately 1,000m.

We determined that we're likely to require two underground pipelines for the Project. One to transfer recycled water from Mogden STW to the River Thames upstream of Teddington Weir. The other (much shorter) one to transfer river water from the River Thames to the existing Thames Lee Tunnel. This allowed us to focus on appraising sites between Mogden STW and upstream of Teddington Weir in Stage 2 and beyond.

We examined and discounted a number of alternative abstraction and discharge points through Stage 1 and have provided further information below.

Did you know?

The Thames Lee Tunnel is an existing below ground pipeline, constructed in the 1960s and 1970s to move water from the River Thames at Hampton to reservoirs and water treatment works in the Lee Valley prior to supply across London.

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Why not locate the abstraction facility further upriver?

An essential provision of the Project is its ability to connect with the Thames Lee Tunnel to take river water to the Lee valley reservoirs.

A key driver in achieving this provision is to ensure that the amount of construction associated with the connection between abstraction and the Thames Lee Tunnel is minimised, to in turn reduce the associated land use and environmental impacts. Accordingly, the search for abstraction and connection sites has been greatly informed by the location of both the freshwater River Thames and the Thames Lee Tunnel. We have particularly looked where the two features converge, and the availability of land that is suitably sized, level, open and accessible to facilitate construction over the fewest sites necessary.

There are only two points at which the Thames Lee Tunnel and the freshwater River Thames converge, the first at the start of the Thames Lee Tunnel at Hampton and the second is approximately 400m upstream of Teddington Weir.

The availability of river frontage land around Hampton to locate the required Project infrastructure is limited. Open land to the east and within Bushy Park Royal Park and Hampton Court is of sufficient size however, this carries greater land use constraint due to the Royal status and associated land and heritage designations .

Hampton is also located approximately 3km further away from Mogden STW, which would result in the requirement for a longer pipeline and greater number of intermediate shafts.

Furthermore, the location at Hampton was not considered suitable due to there being insufficient distance for any recycled water discharged at this location to mix fully with river water before reaching at least one existing raw water intake site downstream of any potential discharge location. These being either the Hampton intake itself if the discharge was upstream of the Thames Lee Tunnel intake and/or the Surbiton intake which is downstream of Hampton. In the event there is not enough distance for the water to mix with river water before being abstracted, the Project would require greater levels of treatment of the final effluent to comply with drinking water standards.

That would mean a full advanced treatment would likely be required . In addition to the increases in carbon, cost and environmental impacts that would arise due to the construction and operation of a full advanced treatment facility, there is not enough space at Mogden STW to accommodate such a facility. This means additional land, outside of the Mogden STW site, would be required to accommodate the full advanced treatment facility along with further conveyance tunnels for final effluent and recycled water flows. This would give rise to considerable increases in the environmental and land use impacts of the Project.

Why not discharge directly to the Thames Lee Tunnel?

A direct discharge of recycled water periodically into the Thames Lee Tunnel, which also transfers river water from Hampton to the Lee Valley, would temporarily mix two water sources which would not be supported by existing regulatory practice.

In this scenario the Project would require greater levels of treatment of the final effluent to comply with drinking water standards compared to environmental standards. Drinking water is self-evidently treated to a far higher standard than that required by the environmental legislation covering discharges to rivers – although the latter is still rigorous, these permit limits are distinct and different.

As a result, any discharge directly into the Thames Lee Tunnel would require full advanced treatment at Mogden STW and further treatment to drinking water standards following blending with other water in the Thames Lee Tunnel and reservoir. This would result in significant increases in carbon, cost and environmental impacts owing to the need to treat water twice and for additional land outside of Mogden STW to locate the necessary full advanced treatment facility.

Why not discharge below Teddington Weir?

As the abstraction of raw water is a key component of the Project and will, as a result, remove water from within the river channel above Teddington Weir, to ensure overall volumes in this general stretch of the river are maintained to required levels during drought conditions it is necessary to ensure that the discharge of recycled water enters the river above Teddington Weir. Discharge below the Weir would not enable this balancing effect to be achieved because this would lead to a potential lowering of the river level above Teddington Weir when abstraction takes place, increasing stress on the environment and in the worst case impacting the existing fish passes on Teddington Weir.

Conclusions

In summary, we concluded that the Project would require an abstraction of river water and discharge of recycled water just upstream of Teddington Weir, close to the Thames Lee Tunnel and downstream of other water intake sites on the River Thames. This has fed into the Project concept design and forms the parameters within which the infrastructure options sit and the detailed site appraisal undertaken.

Chapter 4

Site option details

This chapter presents the current outcomes from our site options appraisal.

It summarises the site options that were subjected to detailed appraisal, the results of that work and our current thinking regarding our preferred sites at this early stage in the development of the Project. Your views and any information that you provide to us is an important part of our ongoing consideration of the sites that have been identified and will help shape the next stages of developing the Project and finalising the proposals.

Site identification

A number of key principles have informed the number of sites appraised and their location. We appraised 23 sites in total to locate different above ground features of the Project.

For the TTF, outfall and intake structures only one site was appraised for each feature as other options were discounted through Stage 1 of the appraisal process for the reasons set out in Chapter 3.

For potential shaft sites multiple options were appraised. Each of the sites identified represents a general area where construction activities could be undertaken to build and operate the Project. Exact footprints for either permanent features or construction activities have not yet been identified. We've taken a precautionary approach in identifying the area required. In each case there is flexibility to adjust locations within a small distance to suit necessary mitigation or avoid key constraints that might not have been identified yet.

The exact number of shafts is also not yet fixed, and a precautionary approach has been taken in this regard, whereby we've sought to establish shaft sites at a distance of no more than approximately 1,000m apart. As our understanding of the engineering requirements improves our final need for shafts may alter.

All sites appraised are shown in the following figure and table alongside the appraisal findings.

We've reached an initial view as to which of the sites could be retained as preferred locations for different aspects of the Project, as well as those sites that we feel perform less well but nonetheless could represent an alternative to a preferred site in a given area of the Project. We've also identified those sites that we consider should be removed from the process and not given further consideration.

Our appraisal of the 23 sites is set out in the next section of this chapter. Further details, including a written explanation of the appraisal process and its outcomes, including reasons for removing some options are contained within the site appraisal report for the Project, 'Teddington DRA site appraisal report' and is available via: thames-sro.co.uk/supportingdocuments.

A 'map-book' showing the location of all of the sites listed in the table is also available via: thames-sro.co.uk/supportingdocuments.

We have presented a summary of outcomes from a site appraisal process. Is there anything else we should consider regarding these sites?

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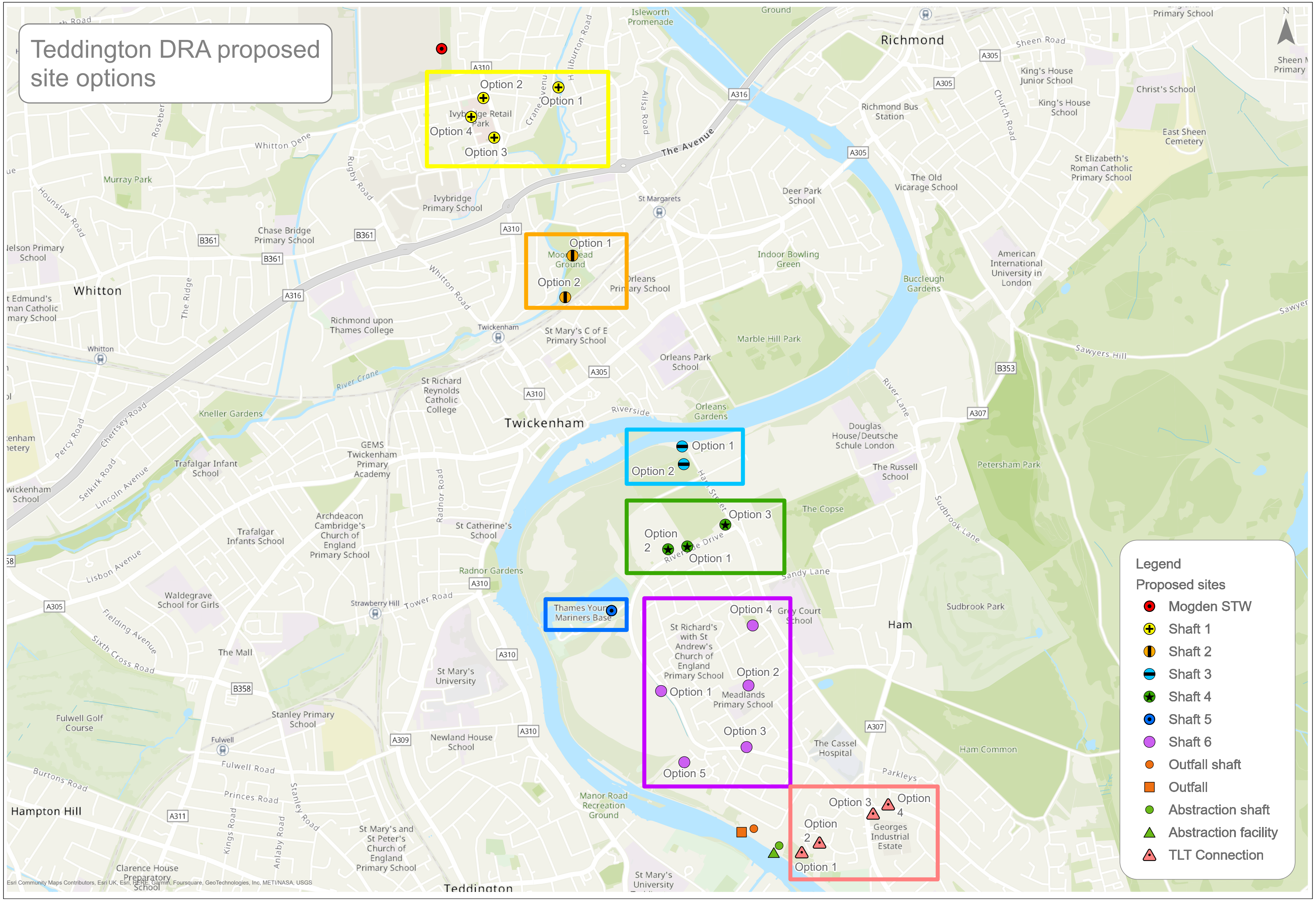

Teddington DRA proposed site options
Option 2
Option 1
Option 4
Option 3
Option 1
Option 2
Option 1
Option 2
Option 3
Option 2
Option 1
Thames Young Mariners Base
Option 4
Option 2
Option 1
Option 3
Option 5
Option 3
Option 4
Option 2
Option 1
Richmond
Twickenham
Whitton
Ham
Hampton Hill
Teddington
Legend
Proposed sites
Mogden STW
Shaft 1
Shaft 2
Shaft 3
Shaft 4
Shaft 5
Shaft 6
Outfall shaft
Outfall
Abstraction shaft
Abstraction facility
TLT Connection

Site use	Site option and geographical area	Appraisal outcome
TTF / Drive shaft and start of recycled water pipeline	Mogden STW	Retain as preferred
Intermediate shaft / recycled water pipeline	Shaft 1 (Option 1): Northcote Recreation Ground	Remove
	Shaft 1 (Option 2): Ivybridge Retail Park car park north	Retain as preferred
	Shaft 1 (Option 3): Ivybridge Retail Park car park south	Retain as alternative
	Shaft 1 (Option 4): Land between Summerwood Road and Ivybridge Retail Park	Retain as alternative
	Shaft 2 (Option 1): Moormead and Bandy Recreation Ground central	Retain as preferred
	Shaft 2 (Option 2): Moormead and Bandy Recreation Ground south	Retain as alternative
	Shaft 3 (Option 1): Ham Street car park	Retain as preferred
	Shaft 3 (Option 2): Land to the south of Ham Street car park and west of Ham Street	Retain as alternative
	Shaft 4 (Option 1): Land to the west of Riverside Drive playground	Retain as preferred
	Shaft 4 (Option 2): Land at Ham Playing Fields car park	Remove
	Shaft 4 (Option 3): Land at Riverside Drive and Ham Street	Retain as alternative
	Shaft 5: Thames Young Mariners	Remove
	Shaft 6 (Option 1): Ham Lands, west of Riverside Drive	Retain as preferred
	Shaft 6 (Option 2): Meadlands School playing field	Remove
	Shaft 6 (Option 3): Land at Dukes Avenue	Retain as alternative
	Shaft 6 (Option 4): Ham Green	Retain as alternative
	Shaft 6 (Option 5): Land adjacent to Thamesgate Close	Remove
Recycled water outfall / recycled water pipeline reception shaft River water abstraction facility / Thames Lee Tunnel conveyance pipeline	Outfall and abstraction facility south of Burnell Avenue	Retain as preferred
Thames Lee Tunnel connection / Thames Lee Tunnel pipeline	Thames Lee Tunnel Connection (Option 1): Land south of Northweald Lane	Retain as alternative
	Thames Lee Tunnel Connection (Option 2): Land west of Horsley Drive	Remove
	Thames Lee Tunnel Connection (Option 3): Land at Tudor Drive	Retain as alternative
	Thames Lee Tunnel Connection (Option 4): Land at Barnfield Avenue	Remove

Tertiary treatment facility

There is only one site option appraised for the location of the TTF and first shaft for the pipeline, which is at Mogden STW.

Site description

The TTF and the site for the start of the recycled water pipeline would be entirely contained within the boundary of Mogden STW and adjacent to or over existing operational facilities.

It is expected the TTF would be developed in the south east corner of the site near to the final effluent channel. To ensure sufficient space to accommodate the TTF, the toe of the site embankment may need to be excavated to create a level platform.

The infrastructure within Mogden STW that is required would include:

- A pipeline from the final effluent channel and transfer pumping station.
- The TTF consisting of multiple process unit buildings, serviced by ancillary plant and equipment such as chemical stores, compressor units and a power supply.
- A new shaft for the start of the recycled water pipeline from Mogden STW.

Appraisal outcomes

The location of the TTF and start point of the pipeline within our Mogden STW minimises off site development and takes advantage of existing infrastructure, although development will need to make careful use of limited space and ensure operations at the site remain unaffected. The use of the site allows construction works to make use of its good existing road links.

The site is, however, within Mogden Sewage Works Site of Importance for Nature Conservation (SINC) and contains deciduous woodland priority habitat, some of which may require removal from the landscape bund to allow for construction of the TTF and shaft. The careful design of the TTF and use of appropriate construction techniques will help minimise adverse ecological effects on this habitat. A small proportion of the SINC may be impacted during construction and operation, however the majority of works is likely to utilise areas of existing hardstanding. Potential air quality, noise and vibration impacts on local communities will need assessment and potentially mitigation. The site also falls within a Local Open Space designation and appropriate mitigation may be necessary.

Mogden STW represents our preferred site for the TTF and start of the recycled water pipeline.

Intermediate Shaft 1

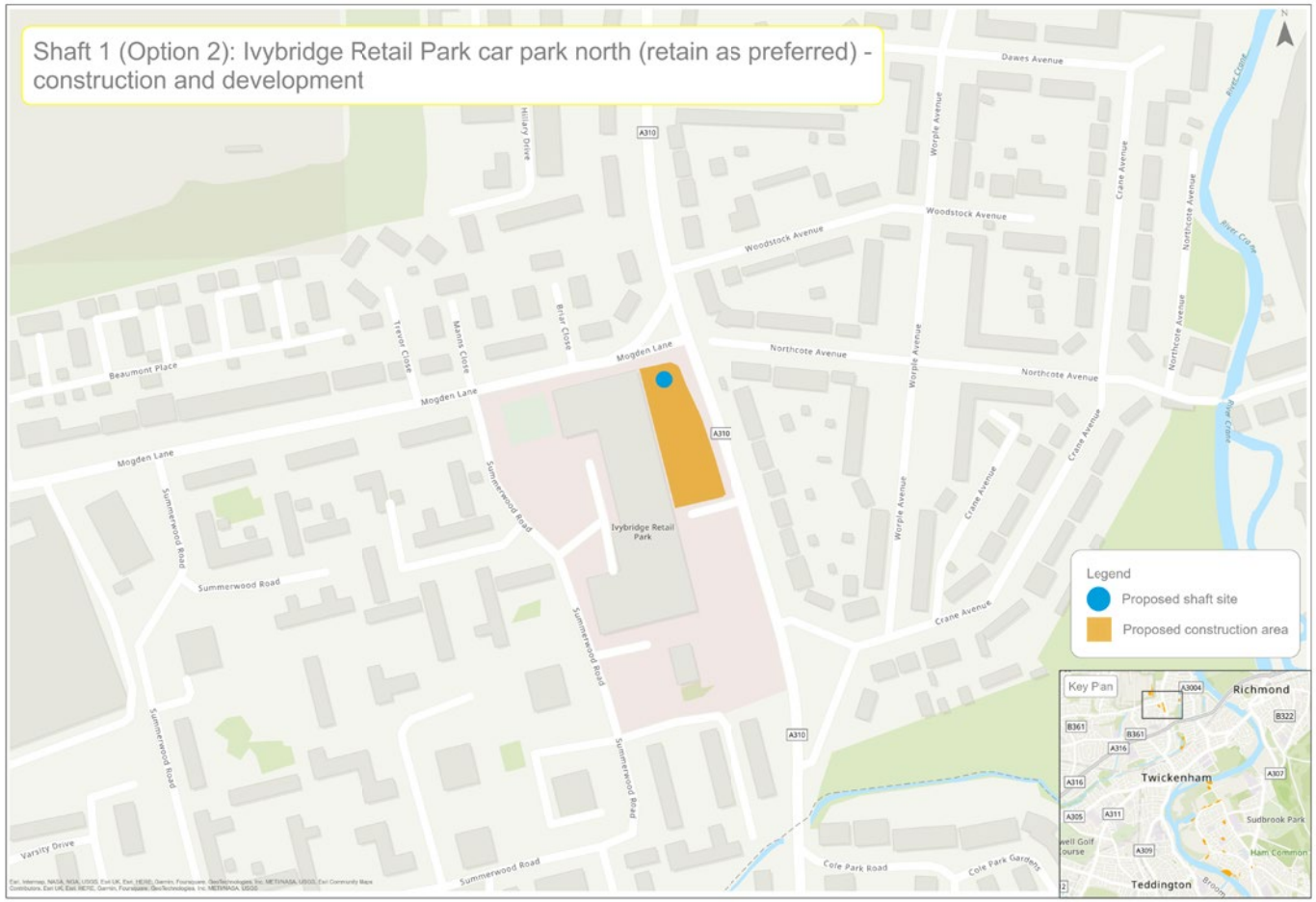
As part of the completion of Stages 4 and 5 of the appraisal process it was recognised that use of Intermediate Shaft 1 Option 1: Northcote Recreation Ground would be likely to give rise to potential significant impacts on its Village Green status, proposed Local Nature Reserve status, and its newly created wildlife habitats, and that access to the site is very constrained. Given the presence of nearby alternatives, this site has been removed from the process.

This leaves three remaining site options for Intermediate Shaft 1.

Site description

Two of the site options are located within Ivybridge Retail car park, one in the north of the car park (Shaft 1 Option 2) and the other in the south (Shaft 1 Option 3), both of which are located adjacent to and accessed from Twickenham Road.

The third retained option is located on land between Summerwood Road and Ivybridge Retail Park (Shaft 1 Option 4) on an area of open space designated for dog exercising.

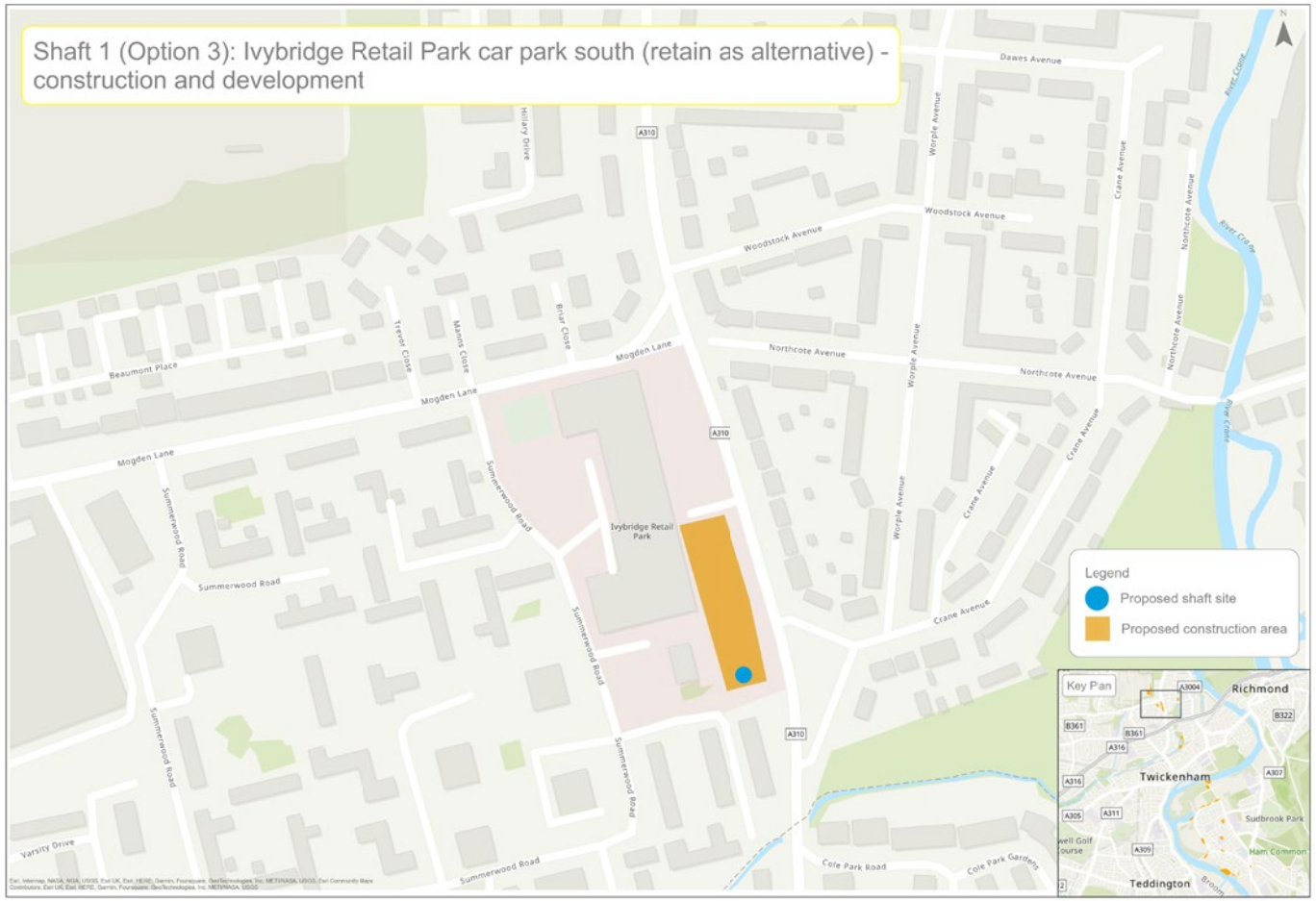


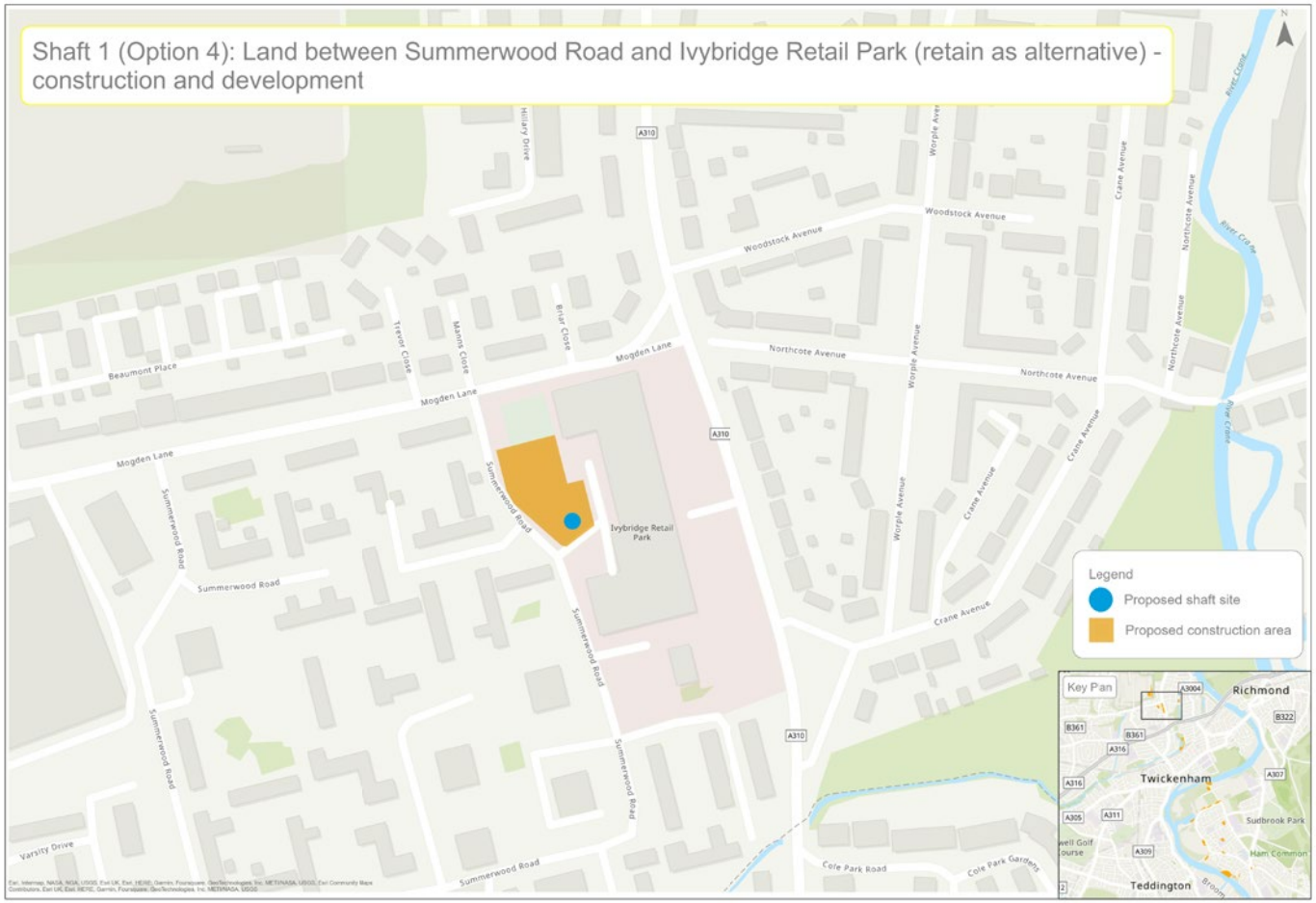
Appraisal outcomes

Both of the car park sites offer a level and open location and site in which to construct the first shaft for the recycled water pipeline. Use of either car park would not be expected to give rise to any ecological impacts, and both also benefit from the ability to take direct access from Twickenham Road.

Both sites would also give rise to very similar impacts upon the use of the car park, including access impacts upon other car park users during construction. These impacts will need to be managed and mitigated, along with the impacts from the temporary reduction in car parking spaces that would result from the creation of a construction site and compound within part of the car park and the potential impacts upon businesses and users that this would give rise to.

Both sites could potentially give rise to construction air quality, noise and vibration impacts upon nearby receptors, including the retail units and residential areas close to the site, and the community and recreation facility (Bridgelink Centre) to the south which would require mitigation.





Option 3 would require the pipeline alignment to pass beneath the retail units. It is not currently clear whether this would be feasible as details relating to the retail unit foundations are not known at this stage. This factor is also an issue that affects the land between Summerwood Road and Ivybridge Retail Park (Option 4), as the pipeline would need to pass beneath the same retail units.

Option 4 also has good access on to Mogden Lane but is adjacent to a number of high-rise buildings which could be impacted upon by elevated noise levels for which mitigation may be difficult, and residents will experience a temporary loss in open space. Use of the site would also temporarily prevent its use for local amenity purposes, whilst impacts upon local bus services and deliveries servicing the retail units would need to be considered.

As it is considered to give rise to marginally less impacts, and is accessible for a pipeline alignment, **Shaft 1 Option 2 represents our initial preferred site for an intermediate shaft in this area if required.**

Intermediate Shaft 2

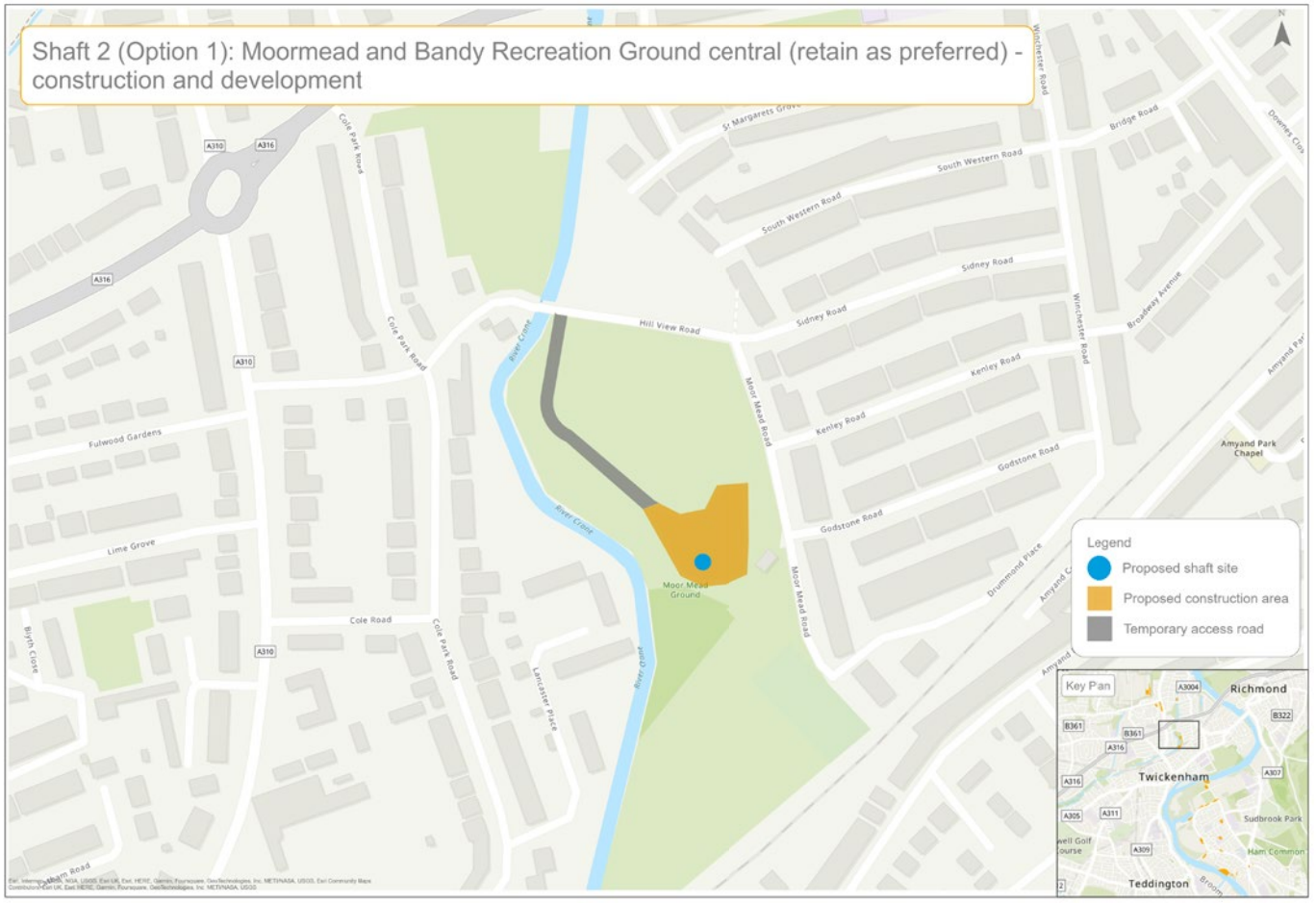
Site description

There are two retained options for the location of Intermediate Shaft 2:

- Option 1: Moormead and Bandy Recreation Ground central
- Option 2: Moormead and Bandy Recreation Ground south

Option 1 is situated within the central area of the Moormead and Bandy recreation ground, south of Hill View Road and north of the access path that runs through the centre of the park between Moor Mead Road and Cole Park Road. A temporary access track would be required from Hill View Road to a construction area, which could potentially be located on the western perimeter of the recreation ground, avoiding the need for construction traffic to use residential roads to the east.

The location of the potential shaft would need to take into account the intended position of the new cricket boundary, football pitch, and the new sports pavilion, as well as the existing children's play area and outdoor gym. Whilst the pitches could potentially be impacted during construction, the final shaft covers would be located outside of all of these uses.

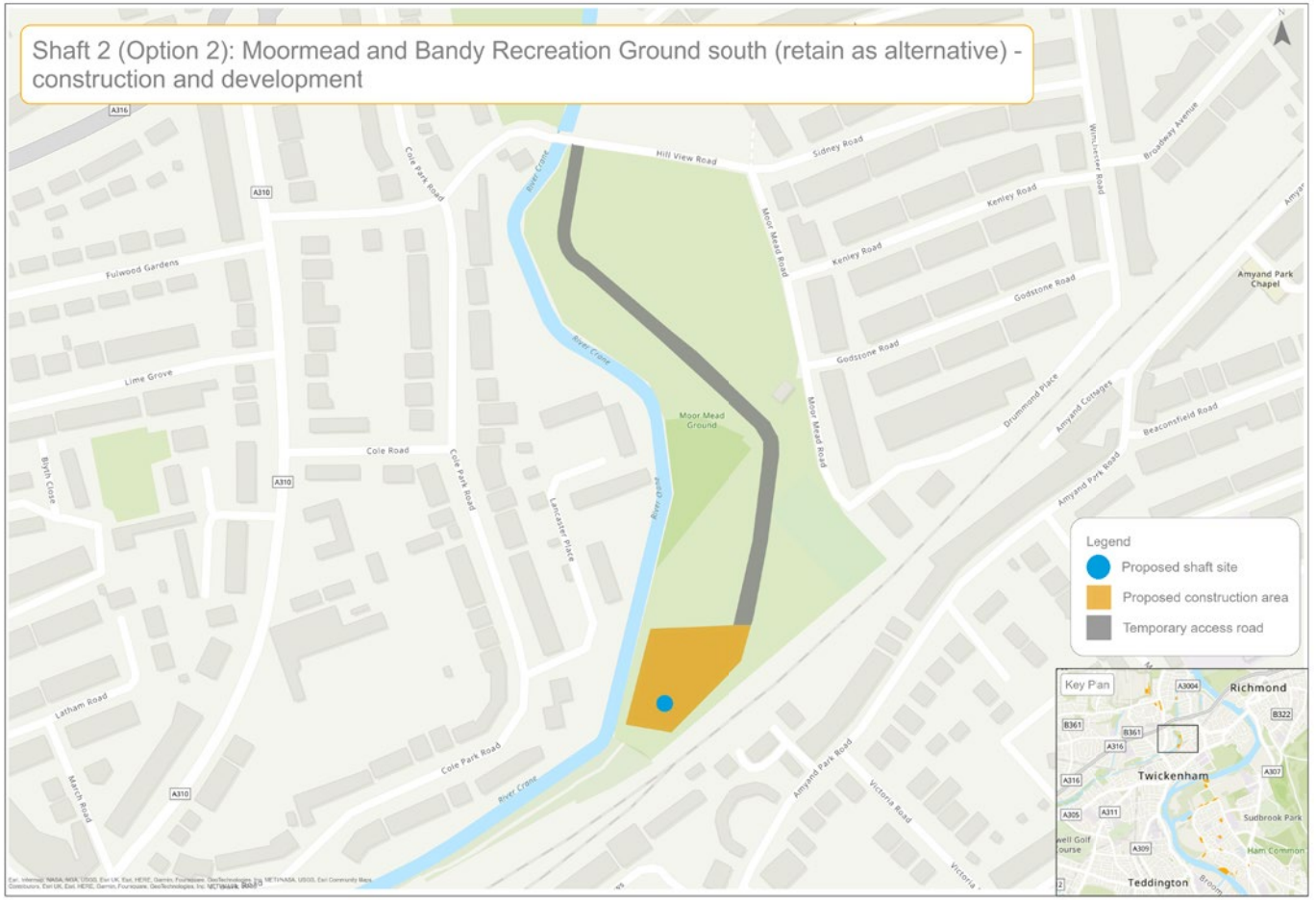


Option 2 is situated in the southern area of the recreation ground below the access path that runs through the centre of the park between Moor Mead Road and Cole Park Road, and to the west of the tennis courts. A temporary access track would need to extend through the centre of the recreation ground to reach the site, which would be located in close proximity to the railway line

Appraisal outcomes

Both sites provide level areas on which to construct a shaft on land that comprises of common low value grassland which can be easily reinstated. However, at both sites construction could give rise to impacts upon multiple receptors.

Option 1 in the centre of the recreation ground may temporarily impact upon use of the cricket and football pitches which are due to be reinstated, whilst both options would impact on users of the more informal space along the west of the park, as well as users of Hill View Road through the installation of the temporary access route. Noise and vibration impacts may also be generated at both sites, and construction impacts, including those arising from dust and surface run off could require management and mitigation so not to cause significant impacts on local receptors.



Both sites are also respectively within and adjacent to the Moor Mead Recreation Ground and River Crane at St Margaret's SINCs, and are designated as Metropolitan Open Land space. This will require careful consideration, particularly of the need to establish a suitable buffer along the river.

The preferred access to the sites is considered to be from the west along Hill View Road and the impacts upon road users will need to be taken into account.

Both sites could also give rise to cumulative impacts if the proposed new pavilion is under construction at the same time as shaft works. Option 2 would impact upon pedestrian access across the park between Moor Mead Road and Cole Park Road, in proximity to the existing play areas. Option 2 would also be sited close to the railway line which would require further investigation if progressed.

Recognising that both sites would cause temporary disruption for users of the recreation ground, it is considered that **Option 1 presents the best opportunity to minimise and manage those impacts and so this represents our preferred site for an intermediate shaft in this area if required.**

Intermediate Shaft 3

Site description

There are two retained options for the location of Intermediate Shaft 3:

- Option 1: Ham Street car park
- Option 2: Land to the south of Ham Street car park and west of Ham Street

Option 1 occupies Ham Street car park, and some open space land to the west of the car park. The site presents a possible opportunity to minimise open space impacts through the use of the existing hard-standing area of the car park and also incorporates the existing riverside landing area enabling possible transport of material to and from the site via the river.

Use of the site removes parking provisions for a number of nearby amenities and so the provision of replacement parking during construction would be needed. Use of the existing riverside landing area for river transport would also temporarily remove access to the river at this point for recreational users. The site would interface with a range of different road users and would also require temporary path diversions.

Option 2 is situated to the south of Ham Street car park and to the west of Ham Street on recreation open land. Use of the site would provide an opportunity to minimise disruption to Ham Street car park and to some users of Ham Street, although it would still interface with multiple users of Ham Street. Due to the amount of open space at this location there is flexibility regarding the actual location of a construction site, although a shaft location as far north as possible within this site will better meet engineering requirements and distances between shafts.

Appraisal outcomes

There is adequate space at both sites to construct a shaft. The proximity of the River Thames could give rise to flood risk at Option 1 during construction and this will need careful consideration and potentially mitigation. The proximity to the river may also provide the opportunity to consider the use of barges to transport material and to reduce construction traffic on nearby roads.

Use of both sites will need to be carefully planned to retain areas of higher value habitat around the perimeters of the site and avoid degradation. Priority habitats (deciduous woodland and native hedgerows) are present along the boundaries of

the sites, and potentially provide suitable habitat for birds, bats, badgers and stag beetles, which will require mitigation if found to be present. A full heritage assessment is likely to be required given the proximity of Ham House Registered Park and Garden and Grade II listed building and the entire site for Option 1 being within the Ham House Conservation Area, with parts of the site located within Archaeological Priority Areas (APAs) (Thames Foreshore and Bank, and Ham Fields APAs).

The use of the waterfront at Option 1 would require works within the River Thames and Tidal Tributaries SINC, although the existing concrete structure at the site is likely to limit any loss of habitat.

Plans for the temporary diversion of the footpath along the riverfront would need to be developed for Option 1. Traffic impact on road users along Ham Street will need to be considered carefully for both sites, with the adoption of appropriate traffic management.

The permanent loss of a very small area of Metropolitan Open Land for the shaft access cover following construction will also require careful consideration.

As Option 1 may benefit from the ability to make use of river transport and would make use of an existing car parking area during construction this represents our preferred site for an intermediate shaft in this area if required.

Intermediate Shaft 4

As part of the completion of Stages 4 and 5 of the appraisal process it was recognised that use of Intermediate Shaft 4 Option 2: Land at Ham Playing Fields car park would be likely to give rise to the potential loss of the entire car park during the construction of the shaft with resulting impacts upon existing associated amenity, sports club and business (nursery) uses. Given the presence of nearby alternatives, this site has been removed from the process.

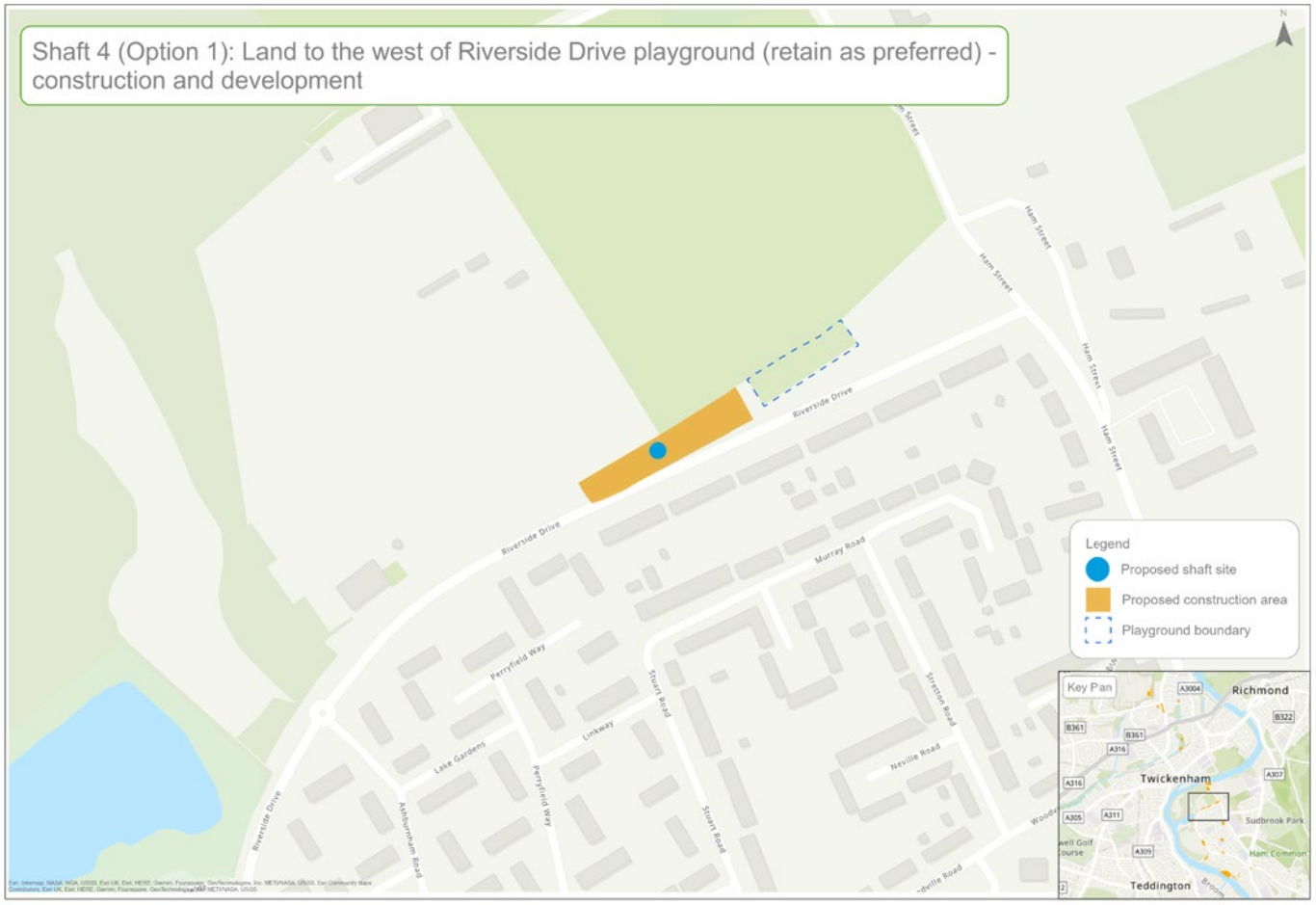
This leaves two remaining site options for Intermediate Shaft 4, which are addressed further below.

Site description

The two retained options for the location of Intermediate Shaft 4 are:

- Option 1: Land to the west of Riverside Drive playground
- Option 3: Land at Riverside Drive and Ham Street

Option 1 is located immediately north of Riverside Drive adjacent to and west of the children's playground in open grassland. The shaft could be sited at any location within the immediate area, although a location in the east towards Ham Street may better facilitate access and construction.



Option 3 is located at the junction of Riverside Drive and Ham Street and is set within open space grassland to the north of Riverside Drive.

Appraisal outcomes

Both sites are located on open space on Riverside Drive and are formed of an elongated and suitably sized area able to facilitate a site compound and shaft. Very limited site clearance would be needed. The proximity to Ham Street car park to the River Thames offers an opportunity to use barges for construction material with vehicle movements along Ham Street and reducing movements elsewhere.

There are no ecological designations or priority habitats on either site and both sites have a low ecological value. Both sites are located within Ham Fields APA, and therefore archaeological desk studies and assessments would be required ahead of any construction to determine presence of archaeological features and mitigation requirements.

Residential properties are located to the south along Riverside Drive and there are nearby recreational and amenity facilities. Key issues that may require mitigating include air quality, noise and vibration impacts during construction, access to the informal green space and disturbance to the use of the playground. Traffic impacts on users of Riverside Drive will need to be considered.

The permanent loss of a very small area of Metropolitan Open Land for the shaft access cover following construction will also require careful consideration.

A key difference between the two sites is the interface that Option 3 will have with Ham Street as well as Riverside Drive if used. Furthermore, Option 3 is located directly adjacent to the Ham House Registered Park and Gardens, and within the Ham House Conservation Area, and so may require bespoke mitigation to be agreed with Historic England.

As Option 1 is considered to have a lesser highways and heritage impacts, this represents our preferred site for an intermediate shaft in this area if required.

Intermediate Shaft 5

Our site options included a potential site located within the Thames Young Mariners outdoor activity centre for the provision of Intermediate Shaft 5; however, further work completed during the course of Stage 4 and Stage 5 of the options appraisal process identified that a more direct route to the River Thames was achievable, thereby removing the requirement for this shaft site.

Accordingly, this shaft and site was removed as part of the conclusion of Stage 5 of the appraisal process.

Intermediate Shaft 6

As part of the completion of Stages 4 and 5 of the appraisal process it was recognised that use of Intermediate Shaft 6 Option 2: Meadlands School playing field would be likely to give rise to potential significant impacts on the school and its playing fields, combined with very limited access into the site and impacts upon neighbouring residential properties. Given the presence of nearby alternatives, this site has been removed from the process.

It was also concluded that use of Intermediate Shaft 6 Option 5: Land adjacent to Thamesgate Close would give rise to considerable impacts on users of the adjacent public right of way, cycle route and access road and, would require considerable tree loss to facilitate site establishment. In addition. it would be located in very close proximity to residential properties. Given the presence of nearby alternatives, this site has been removed from the process.

This leaves three remaining site options for Intermediate Shaft 6.

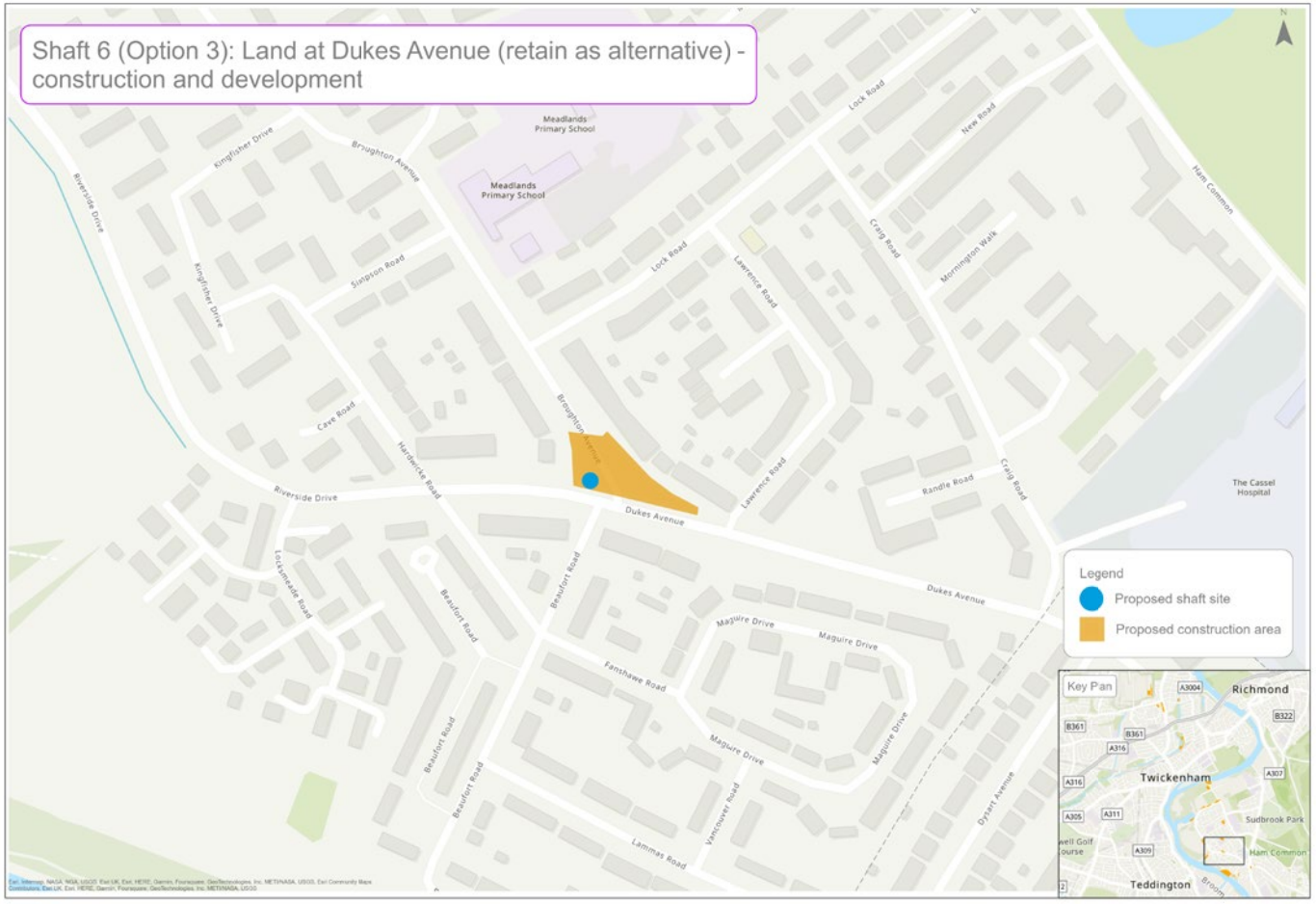
Site description

The three retained options for the location of Intermediate Shaft 6 are:

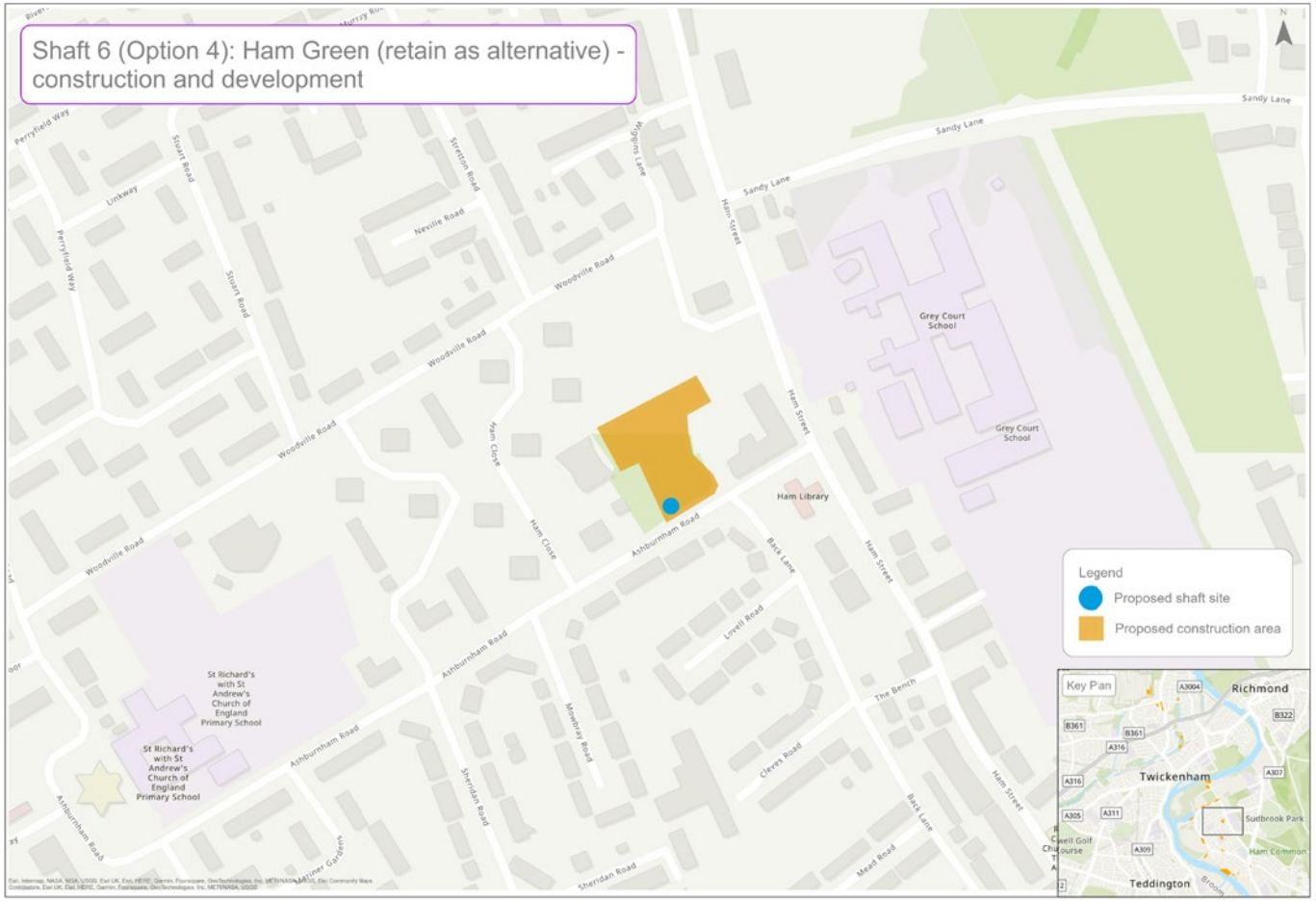
- Option 1: Ham Lands, west of Riverside Drive
- Option 3: Land at Dukes Avenue
- Option 4: Ham Green

Option 1 is situated to the west of Riverside Drive within the edge of Ham Lands Local Nature Reserve and Ham Lands SINC. To enable the site to be reached by Shaft 3 (Ham Street car park) and Shaft 4 (Land to the west of Riverside Drive playground) the most appropriate position for this intermediate shaft would be in the north of the site area.

Option 3 is situated within the grass verges at the junction of Dukes Avenue, Broughton Avenue and Beaufort Road. The location of the shaft would be intended to avoid shaft construction within the road, although road closures could be likely during construction. Construction would take place in close proximity to residential properties and therefore mitigation would be required.



Option 4: Ham Green, is situated on informal open space adjacent to the existing Ham Green residential area and its neighbouring shops and services. Grey Court School and Strathmore School are located a short distance away to the east and St Richards School is located to the south west. The site is located between Ashburnham Road and Woodville Road to the south and north respectively, whilst Ham Street is nearby to the east. Riverside Drive is located approximately 600m to the west. The site is also located immediately adjacent to the recently consented Ham Green redevelopment area.



Appraisal outcomes

Use of Option 1 could potentially impact on nearby residential properties, users of nearby roads, and upon ecology within the site footprint. The site is located within Ham Lands Local Nature Reserve, at the northern boundary, and within Ham Lands SINC. The layout of the construction compound could avoid loss of trees/lowland mixed deciduous woodland and would utilise the grassland habitat in this area. The south-west of the site is bordered by lowland mixed deciduous woodland priority habitat which would need to be demarcated to prevent encroachment. This habitat could potentially support birds, bats and badgers and therefore protected species surveys will need to be completed to confirm if present, and any mitigation requirements. The site is also located in the Ham Fields APA.

The Option 1 site is a well-used open space with numerous informal footpaths, some of which would be inaccessible during construction, although there are alternative pathways which could be used. The site is directly west of Riverside Drive, so temporary localised changes to visual amenity, noise, vibration and dust issues could be experienced during construction and therefore will need further assessment and potentially mitigation.

The permanent loss of a very small area of Metropolitan Open Land for the shaft access cover following construction will require careful consideration.

The Option 3 site at Dukes Avenue is small and although the site utilises highway verge, and so avoids conflict with environmental designations, the site is located in close proximity to residential properties giving rise to potential construction noise, vibration and air quality impacts. Use of the site would also be likely to require some road closures to facilitate provision of a compound and shaft construction, which will impact on road uses including bus routes and visitors to nearby Meadlands School, as well as residential users. The same road verge location does however enable good access for construction works.

Option 4 at Ham Green is adequately sized for a site compound and storage of materials. Use of the site could be integrated into the forthcoming regeneration proposals for this part of Ham enabling final reinstatement to contribute to renewed open space. However, construction of a shaft in this location may also coincide with the regeneration development and so consideration of cumulative impacts will be important.

The Ham Green site is adjacent to the Ham APA and Ham House Conservation Area , meaning specific mitigation may be required to address impacts. Access is through the residential area and, whilst both adjacent roads are wide enough, it would bring traffic into proximity to other receptors and require access via and adjacent to mixed land uses to the west onto Riverside Drive or to the east onto Ham Street. Use of the site would lead to temporary loss of open space and construction would take place in proximity to schools, a youth centre and residential properties for which air quality, noise, visual amenity, and lighting will need to be considered. Furthermore, diversion of underground utilities are likely to be needed at this location.

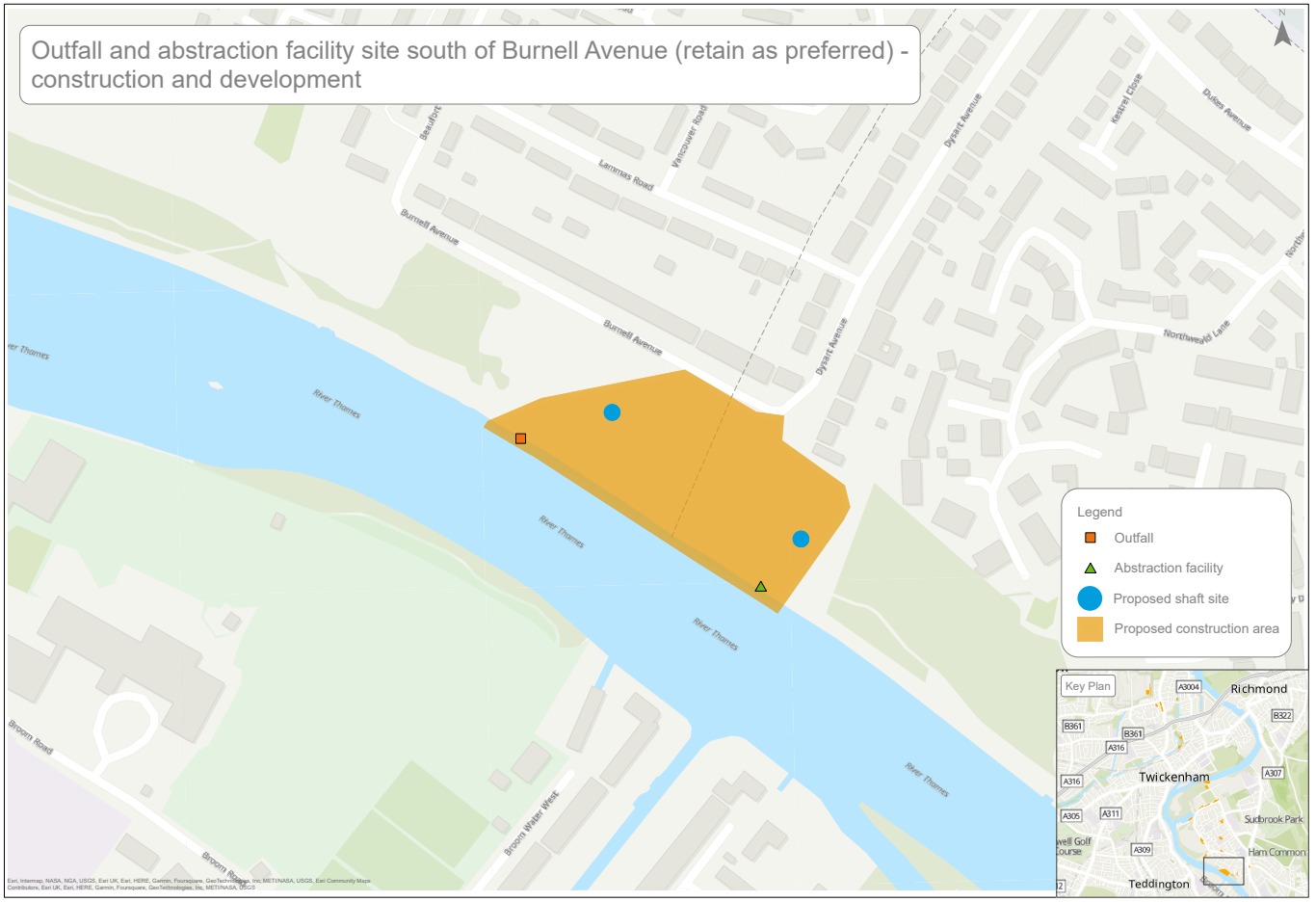
As it enables the Project to achieve some separation from residential receptors and achieves a good level of access, Option 1 represents our preferred site for an intermediate shaft in this area if required.

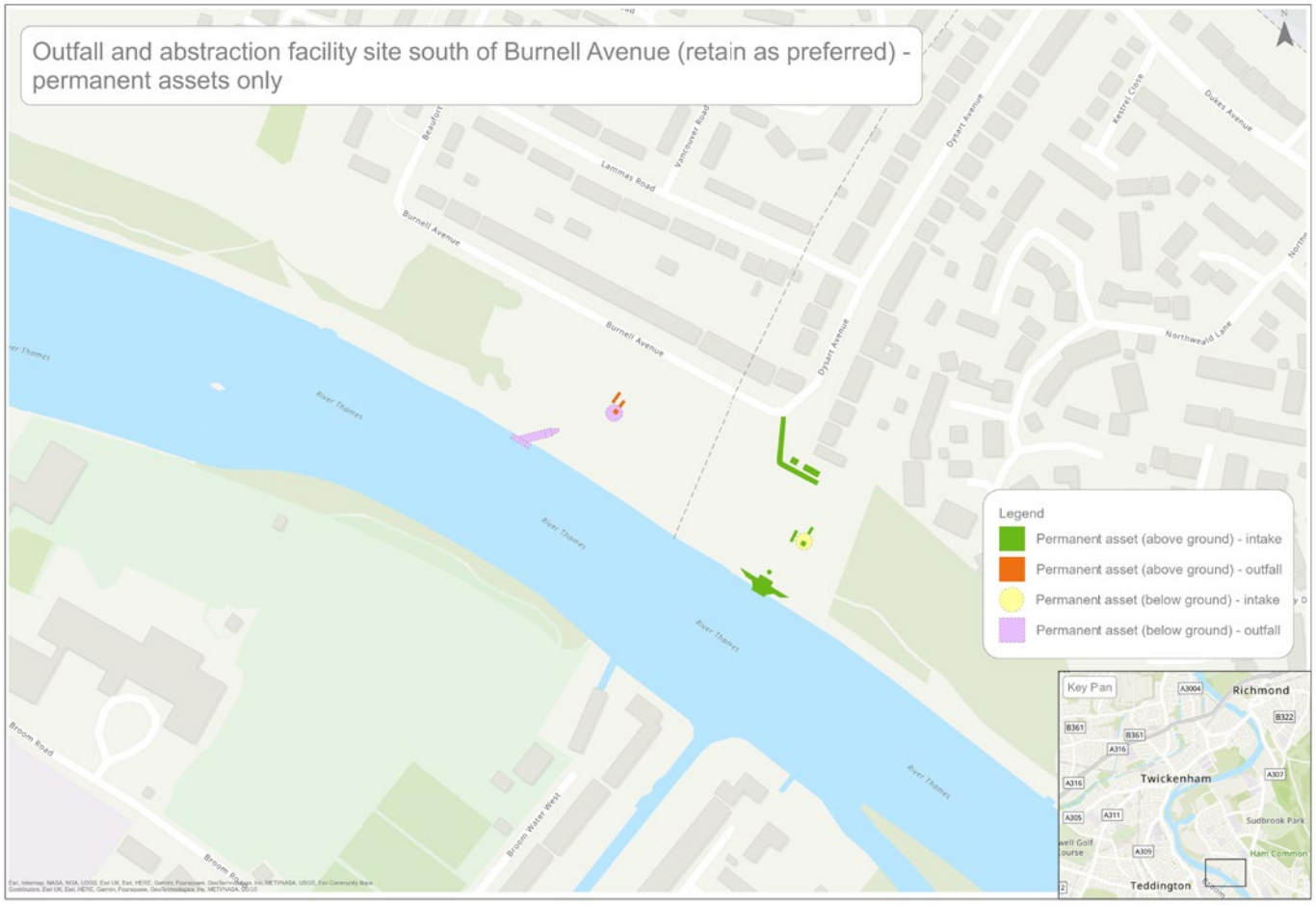
Outfall and abstraction facility site south of Burnell Avenue

Site description

The location of both intake and outfall structures would be on the riverbank and within existing open space, all located to the south of Burnell Avenue upstream from Teddington Weir. The following will be constructed:

- A temporary construction compound, likely to be sited within open space grassland during construction and reinstated to open space once works are complete.
- A reception shaft within the open space grassland for the recycled water pipeline.
- Pumping equipment and valves below ground and within the open space grassland.
- A below ground connection pipeline from the reception shaft to the outfall on the riverbank.
- An outfall set below river level with a decking cover at footpath level.
- An intake structure approximately 180m upstream of the outfall structure set partially within the river and partially within the riverbank.
- A connection pipeline away from the intake structure to a drop shaft within open space.
- A below ground pipeline connected to the drop shaft to convey river water to the Thames Lee Tunnel.
- Power supply.





There is the potential that the outfall structure could be located fully in-river, but further detailed assessment of this is needed.

The exact location of both structures on the riverbank can adjust to some degree through final design, although as both are river-dependent they need to be situated in and / or adjacent to the river and have access to the river in close proximity to the Thames Lee Tunnel as set out in Chapter 3.

Appraisal outcomes

Although there are two main elements of the Project to be delivered at this site (the outfall and intake) there is adequate space to form a single construction compound for both with space for storage and plant. There is also space to provide compound support for the Thames Lee Tunnel connection shaft sites. There is direct road access to the site from Burnell Avenue to Dukes Avenue and to the A307. The site is next to the river and could support construction of a berth to enable transport of materials by river to reduce transportation of material by road. The public footpath along the river would need to be temporarily diverted during construction. Potential temporary air quality, noise and vibration impacts on local communities will need to be considered and mitigated.

The use of this site would lead to a temporary loss of terrestrial habitat, mostly grassland. The site is located in an area of designated public open space and will also require temporary and permanent works within two SINCs; Ham Lands SINC and River Thames and tidal tributaries SINC. Once all permanent above-ground structures have been installed the remainder of the site would be reinstated and replanted. Biodiversity impacts will need to be mitigated and biodiversity net gain provided. There would also be some permanent loss of riparian habitat due to the intake and outfall structures on the river bank which will need management and mitigation. All construction works will require careful management to ensure there are no risks of contamination of the River Thames during construction.

The permanent above-ground infrastructure will lead to the permanent loss of small areas of land which are designated as Metropolitan Open Land and public open space, and so will require sensitive design and to ensure that permanent public open space loss is kept to an absolute minimum.

The site is located within an APA and further archaeological and historic environment assessment will be required to determine any necessary mitigation measures. Any above-ground infrastructure will need to be carefully designed to reduce the impacts to the Riverside North Conservation Area and the local character and amenity of the area.

The river front and River Thames in this area are regularly used for recreational activities and careful integration and management of the area will be required to minimise impacts during construction.

Recognising that this site has a number of sensitivities that will need to be addressed it remains our preferred site for the outfall and abstraction facility.

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Thames Lee Tunnel Connection Site

As part of the completion of Stages 4 and 5 of the appraisal process it was recognised that Thames Lee Tunnel Connection Option 2: land west of Horsley Drive was too small and restrictive in size and shape to facilitate construction of the connection shaft. Given the presence of nearby alternatives, this site has been removed from the process.

It was also identified that construction at Thames Lee Tunnel Connection Option 4: Land at Barnfield Avenue site would require full closure of the affected part of Barnfield Avenue and potential occupancy of part of private gardens. Given the presence of nearby alternatives, this site has also been removed from the process.

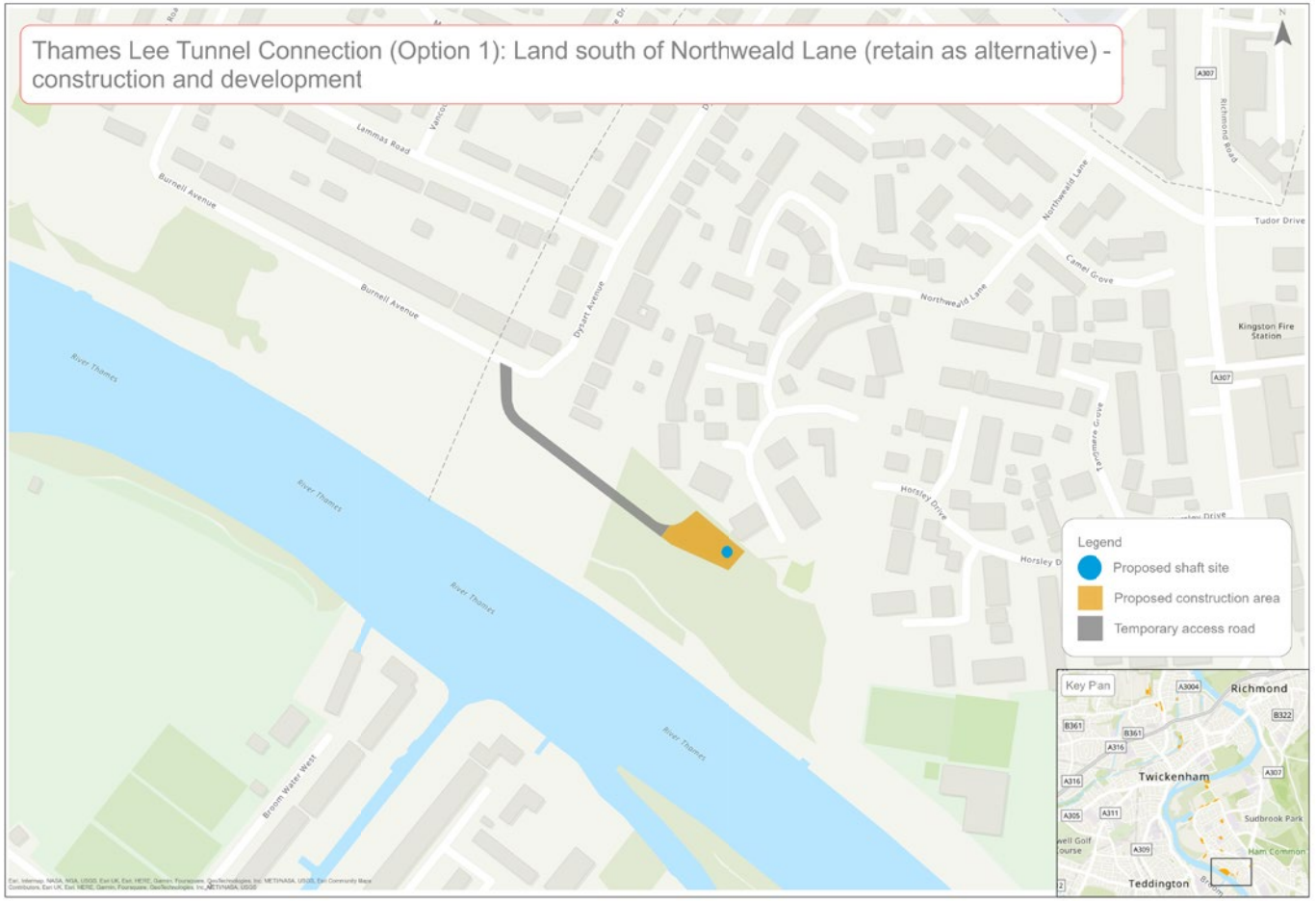
Two options therefore remain under consideration for use as the location of the Thames Lee Tunnel connection, as no preferred site has yet been identified. Each site is summarised individually below in turn.

Option 1:
Land south of Northweald Lane

Site description

The site is located immediately to the south of Northweald Lane within woodland, adjacent to open space at Burnell Avenue. The site is situated adjacent to the Thames Lee Tunnel and in close proximity to the intake structure on the River Thames, so would minimise construction works in this regard.

This site is not large enough to accommodate its own compound during construction and would require an offsite compound, which could be located within the compound for the outfall and abstraction facility south of Burnell Avenue.



Appraisal outcomes

Access to the compound and construction shaft site could be via Burnell Avenue. The site is near to the river and therefore river transport might be possible for construction material. Access to the construction site could be via a temporary track across open grassland and through a woodland area.

The site may require the removal of some deciduous trees to allow for access and shaft construction. Priority woodland in close proximity to the site might be impacted through habitat degradation and disturbance of species using the area. The site and wider area has the potential to support a number of species including badger, bats, birds and stag beetle so appropriate mitigation will be required.

There will be some loss of habitat from the Royal Park Gate Open Space SINC which will require mitigation and potentially compensation, subject to further assessment and design. A number of trees, some subject to Tree Preservation Orders may need to be removed, together with other forms of vegetation. The potential loss of trees, along with a small area of Metropolitan Open Land will require justification against Metropolitan Open Land policy.

The site is in close proximity to residential properties and therefore temporary air quality, noise and vibration impacts may need to be mitigated, as will potential construction traffic impacts upon local roads. In particular, a block of flats directly overlooks the shaft site. These properties may be temporarily impacted by noise, dust, lighting and deterioration of local views during construction. A temporary diversion of the footpath crossing the site may be required to maintain access to the Thames Path, which may impact upon the amenity of the woodland.

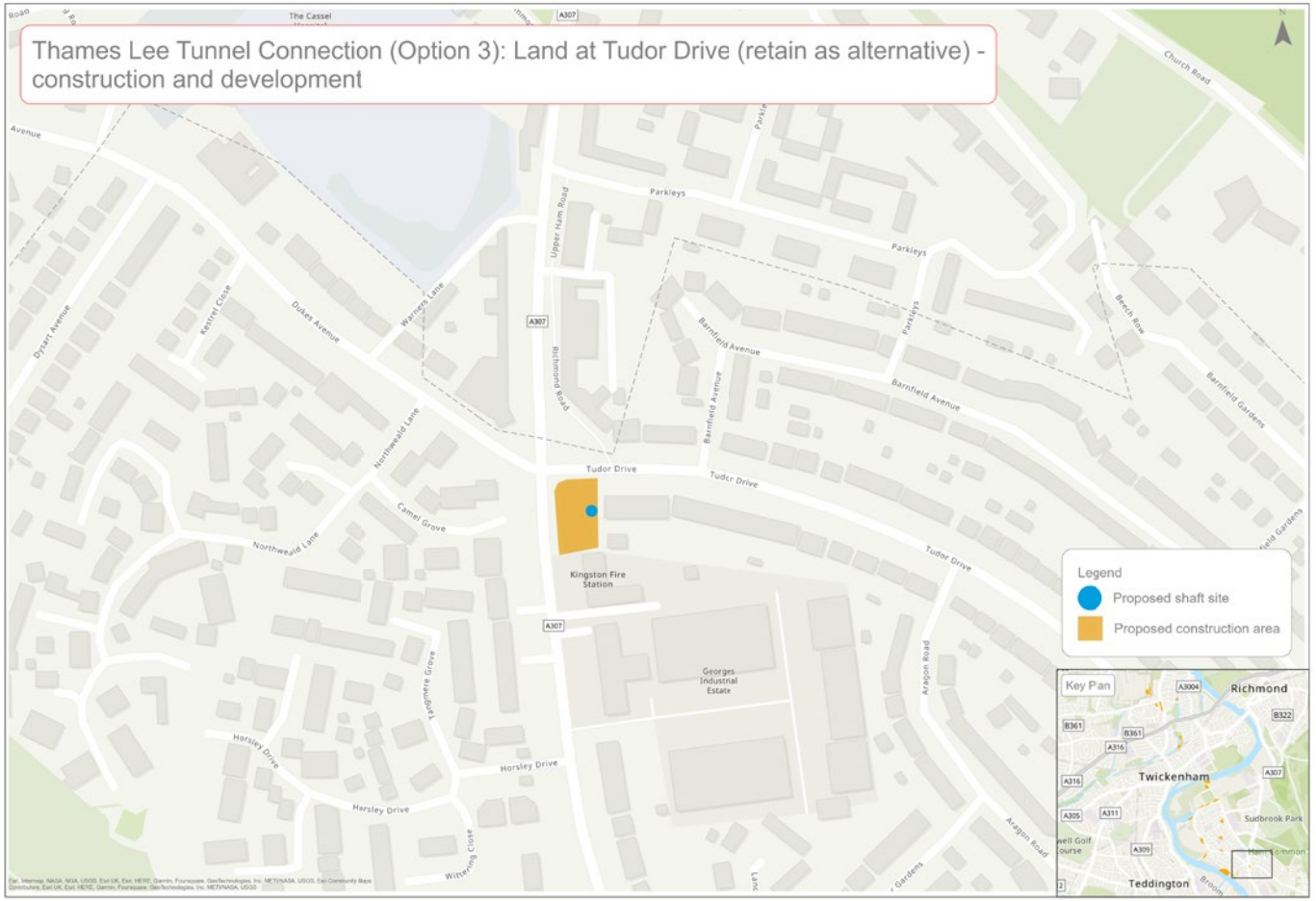
The site is currently retained as one of two alternative sites due to its proximity to the Thames Lee Tunnel and the river abstraction facility. Further work is required to identify how the construction for the connection would interface with the impacts identified at this site in respect of residential amenity, nature conservation, tree preservation, local amenity, and access.

Option 3: Land at Tudor Drive

Site description

The site is located on the corner of Tudor Drive and Richmond Road and would require use of land currently used as a 'pocket park', along with an amenity lawn under control of the adjacent fire station. An existing Thames Lee Tunnel shaft already occupies the corner of the site and there is limited space to form a working site; however, sufficient space is available to construct a new shaft next to the Thames Lee Tunnel at this point.

This site is not large enough to accommodate its own compound during construction and would require an offsite compound, which could be located within the area used for the outfall and abstraction facility construction.



Appraisal outcomes

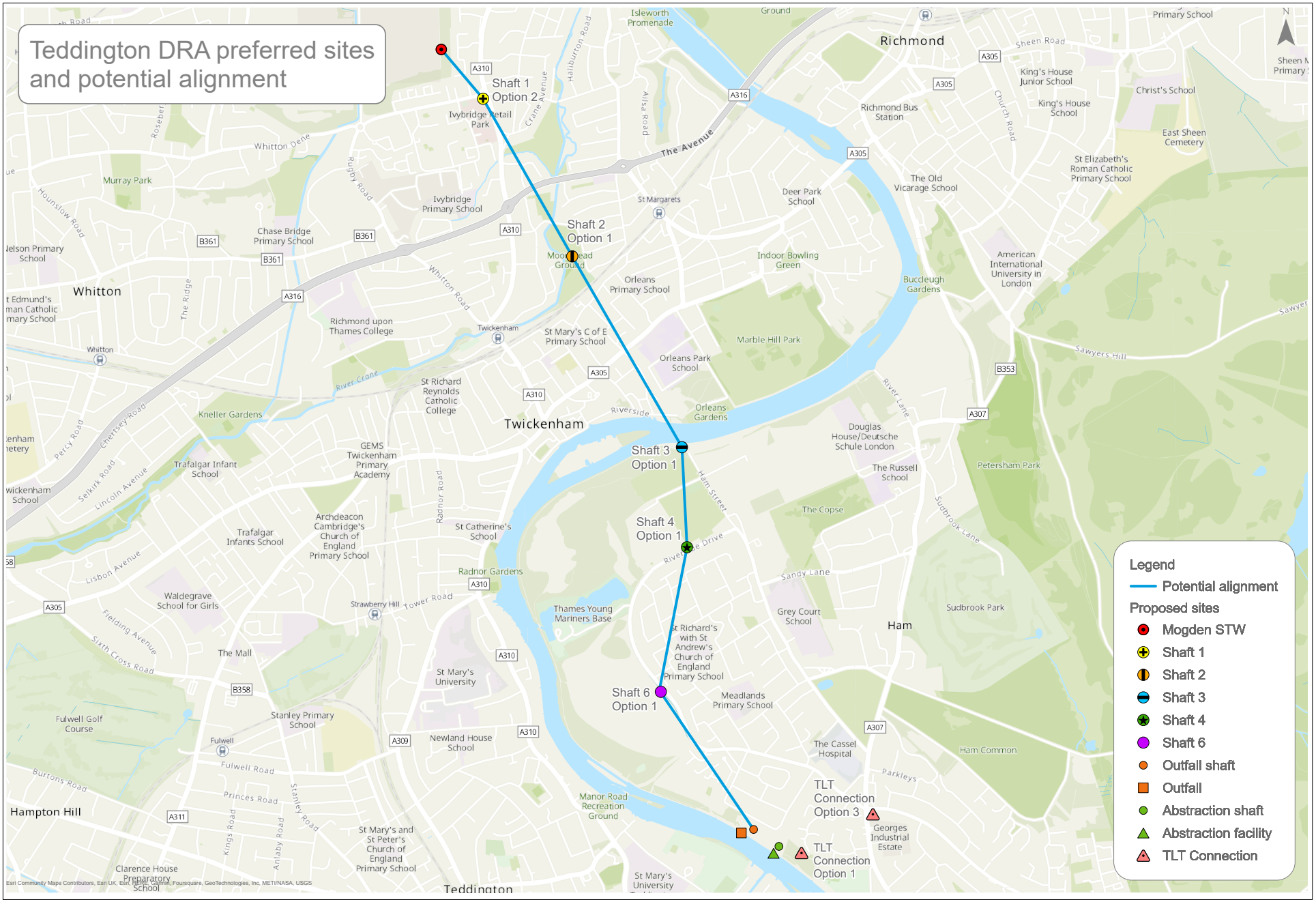
Access to this site is off a major road where there is a potential risk of pedestrian and traffic disruption. The site is next to a fire station which will need to be taken into account when considering construction activities.

There are minimal ecological, water, heritage and land use issues associated with the site. A key issue would be proximity to local residents on Tudor Drive and the potential for dust, noise and vibration impacts during construction. There are potential air quality and noise issues through lane closures and / or traffic management at a busy junction to allow access to the site which will need to be managed and there will be a temporary loss of an informal recreation space for the duration of the construction works.

The site is currently retained as one of two alternative sites due to its proximity to the Thames Lee Tunnel, alongside the alternative Thames Lee Tunnel connection site south of Northweald Lane. Further work is required to identify how the construction for the connection would interface with the impacts identified at this site.

Summary of our preferred sites and potential pipeline alignment

Based on the outcomes of our appraisal process our preferred sites for the Teddington DRA project are shown in the figure below, along with a potential pipeline alignment between each site.


Teddington DRA preferred sites and potential alignment
Shaft 1 Option 2
Shaft 2 Option 1
Shaft 3 Option 1
Shaft 4 Option 1
Shaft 6 Option 1
TLT Connection Option 3
TLT Connection Option 1
Legend
Potential alignment
Proposed sites
Mogden STW
Shaft 1
Shaft 2
Shaft 3
Shaft 4
Shaft 6
Outfall shaft
Outfall
Abstraction shaft
Abstraction facility
TLT Connection
Richmond
Twickenham
Whitton
Teddington
Ham
Hampton Hill
Isleworth Promenade
Ivybridge Retail Park
Ivybridge Primary School
Chase Bridge Primary School
Murray Park
Whitton Dene
Rugby Road
Hounslow Road
Whitton Road
The Avenue
Crane Avenue
Halliburton Road
Ailsa Road
Richmond Bus Station
King's House Junior School
King's House School
Christ's School
East Sheen Cemetery
St Elizabeth's Roman Catholic Primary School
The Old Vicarage School
Deer Park School
St Margarets
Indoor Bowling Green
American International University in London
Buccleugh Gardens
Orleans Primary School
Orleans Park School
Orleans Gardens
Marble Hill Park
Sawyers Hill
River Lane
Douglas House/Deutsche Schule London
The Russell School
Petersham Park
The Copse
Sudbrook Lane
Sandy Lane
Grey Court School
Sudbrook Park
Ham Common
Parkleys
Meadlands Primary School
The Cassel Hospital
Georges Industrial Estate
St Richard's with St Andrew's Church of England Primary School
Thames Young Mariners Base
Manor Road Recreation Ground
Richmond upon Thames College
St Mary's C of E Primary School
St Richard Reynolds Catholic College
Kneller Gardens
River Crane
Riverside
Ham Street
Radnor Road
St Catherine's School
Radnor Gardens
GEMS Twickenham Primary Academy
Trafalgar Infant School
Trafalgar Infants School
Archdeacon Cambridge's Church of England Primary School
Waldegrave School for Girls
Strawberry Hill
Tower Road
The Mall
St Mary's University
Stanley Primary School
Fulwell Golf Course
Fulwell
Fulwell Road
Newland House School
St Mary's and St Peter's Church of England Primary School
Clarence House Preparatory School
Princes Road
Burtons Road
Kings Road
Anlaby Road
Stanley Road
Lisbon Avenue
Fielding Avenue
Sixth Cross Road
Percy Road
Chertsey Road
Selkirk Road
Lincoln Avenue
Wickenham School
Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS

Chapter 5

What happens next

After this consultation has closed we'll review our proposals, having read and considered the feedback received from this consultation alongside the findings of our ongoing work.

This initial site options consultation will help us to decide which sites to take forward and what issues the local communities consider to be most important to them.

Next steps

When the consultation closes in December 2023, an independent company will review and analyse all responses. This company will prepare a report on the views shared by respondents, highlighting key areas of concern and any further information provided. This report, along with respondents' detailed responses, will help to inform our decisions on preferred site options.

This will be followed in spring 2024 with Environmental Impact Assessment (EIA) scoping, which will help to define how to approach the environmental assessment for the Project and what information may be needed to identify the likely significant effects from the development.

During winter 2024/25 we'll hold a further public consultation on the Project. This is when we expect to have completed our preliminary environmental assessments for those topics and areas scoped into the EIA. We'll also have more certainty at this point on the site locations required for the Project. We'll build the Project design and assessments through 2025 incorporating feedback from consultation and engagement to develop our Environmental Statement which will support our planning application early in 2026.

Environmental Impact Assessment

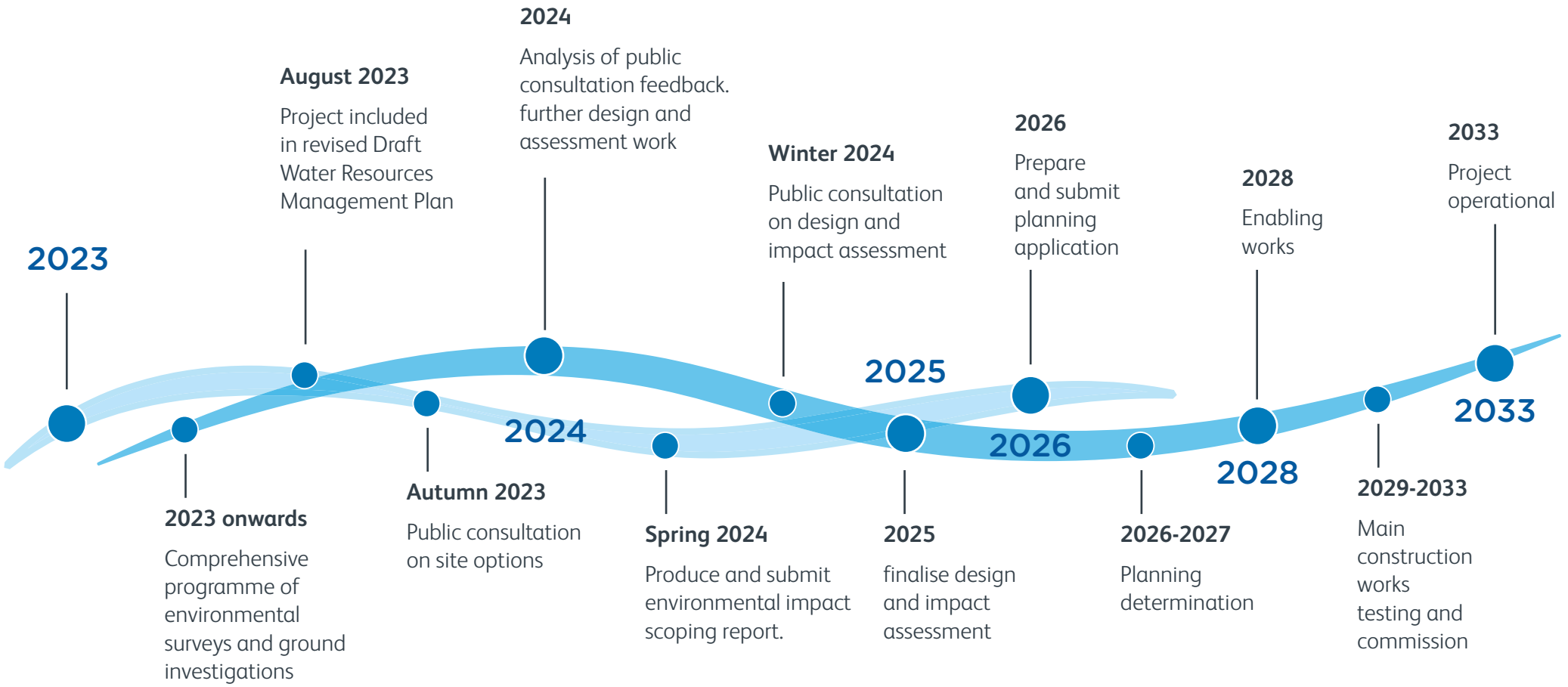
An important component of the planning process is the Environmental Impact Assessment.

We recognise that our proposals have the potential to impact local communities and the surrounding environment in a number of ways. Impacts, both beneficial and adverse, may occur during the construction and operation of the Project and will need to be assessed fully through a process known as Environmental Impact Assessment, or EIA.

We'll prepare and submit to the relevant authorities our proposed scope of the EIA. It will present the envelope of the design upon which environmental effects may occur, set out the baseline understanding and consider what receptors and pathways should be scoped in or out within the EIA.

Once we've agreed the scope of the EIA, we'll carry out a preliminary environmental impact assessment. This assessment will represent a point in the assessment process when the design of the Project is still in development, and the likely significant effects are continuing to be understood. We'll present these early assessment outcomes in our next consultation through winter 2024/25.

Feedback from this further consultation and ongoing engagement will help to inform the design development of the Project, including the potential for measures to address environmental effects. This will include identifying opportunities to enhance the environment through environmental design and development of potential mitigation. The findings of our EIA will be documented in an Environmental Statement, and we'll also complete supporting environmental assessments, such as a Flood Risk Assessment, Water Framework Directive Assessment and Habitat Regulations Assessment which will be submitted with our application for planning in 2026.


2023
2023 onwards
Comprehensive programme of environmental surveys and ground investigations
August 2023
Project included in revised Draft Water Resources Management Plan
Autumn 2023
Public consultation on site options
2024
Analysis of public consultation feedback. further design and assessment work
Spring 2024
Produce and submit environmental impact scoping report.
Winter 2024
Public consultation on design and impact assessment
2025
finalise design and impact assessment
2026
Prepare and submit planning application
2026-2027
Planning determination
2028
Enabling works
2029-2033
Main construction works testing and commission
2033
Project operational

Working with stakeholders

We've been working with and will continue to work with the following:

- National bodies such as the Environment Agency, Natural England and Historic England
- Ofwat and RAPID
- Port of London Authority
- The local authorities – Hounslow, Richmond and Kingston
- Your local MPs
- Existing water-focused and nature conservation groups, both regional and local.

Throughout the next few years we'll continue to engage with those interested in the Project and share information as it becomes available. We'll expand our engagement activities and will provide regular Project updates. We want to involve you, and your views are important to us. Your feedback will help shape the proposals for the benefit of everyone and all of the feedback will be reviewed and carefully considered as we develop the Project.

Engaging with potentially affected landowners

We'll need to access, use and acquire small areas of land either on a temporary or permanent basis for a variety of reasons for the Project. We've started contacting a number of potentially affected landowners and will invite them to engage with us on the proposals on an individual basis.

Chapter 6

What your views can help inform at this stage

There are many factors that we're considering when it comes to developing the design and development of this Project. Your feedback at this stage on site options is a key part of how we'll develop the final Project proposal.

Consultation feedback and questions

Your local knowledge of the river and the surrounding areas is very valuable to us, and we welcome any feedback you have on our site options proposals. It will help us to further understand any potential impacts and opportunities from the Project.

This is our first phase of project-specific consultation, and we plan to hold further consultations in the future as the proposals develop. Regular engagement will also continue with those who have an interest in the Project.

This initial consultation focuses on our site options, i.e. the location of key infrastructure required by the Project, and we want your feedback on the following:

- We have identified Mogden STW as being the location for the proposed tertiary treatment facility and start of the pipeline. Can you give us your views on the use of Mogden STW for these structures and reasons for these views?
- There is a potential to use a number of locations between Mogden STW and the River Thames upstream of Teddington Weir for temporary construction activities and to locate pipeline shafts. Could you give us your views on the use of these sites and reasons for your views?
- Our emerging proposals indicate that the outfall and river abstraction facilities would be situated approximately 180m and 350m upstream of Teddington Weir respectively. Do you consider there is anything we should take into account in selecting the sites for discharge and abstraction, in particular anything regarding the indicative sites?
- For our connection to the Thames Lee Tunnel we require a further shaft site. We are considering two options, either land at Northweald Lane or at Tudor Drive. Could you give us your views on the use of these two sites and reasons for your views.
- Do you have any comments on the process we undertook to identify site options?
- Do you have any other comments about our proposals at this stage of the process?

How you can respond to the consultation

Your feedback will help us to develop the Project and understand what people think of the site options and appraisal. All feedback you share will be reviewed, recorded and carefully considered as we refine our proposals.

We understand the effect on those impacted by our proposals including homeowners, landowners, river users and the nearby community. We're committed to working with everyone as the Project develops and want to hear all views on our emerging proposals.

Submitting your comments

You can submit feedback to us in several different ways:

Using the Project website;
www.thames-sro.co.uk/TDRA

Sending an email to: **TDRA@ipsos.com**

Sending written feedback to us at our freepost address: **Freepost TDRA CONSULTATION**

We'll also be holding events where you can find out more about the Project and talk to the project team. Details about our events and how to book your space can be found at **www.thames-sro.co.uk/events**.

Please make sure you submit your feedback to us by **11.59pm on 11 December 2023**.


Thames
Water