Teddington Direct River Abstraction

Preliminary Environmental Information Report
Non-Technical Summary

Date: June 2025

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1. Introduction

1.1 Overview

1.1.1 This document, prepared on behalf of Thames Water, is a Non-Technical Summary (NTS) of the Preliminary Environmental Information Report (PEIR) that has been prepared for the Teddington Direct River Abstraction (hereafter referred to as 'TDRA' or 'the Project').

1.2 What is an Environmental Impact Assessment?

1.2.1 An Environmental Impact Assessment (EIA) is a process to ensure planning decisions are made with full knowledge of the likely significant environmental effects of a proposed development.

1.2.2 The EIA will be informed by feedback from the statutory consultation, results from ongoing surveys and investigations, and any updates to existing environmental assessments.

1.2.3 The objective of the EIA process is to identify measures to avoid, reduce or offset any adverse environmental effects and enhance any beneficial environmental effects of a proposed development, and then report on the likely significant effects.

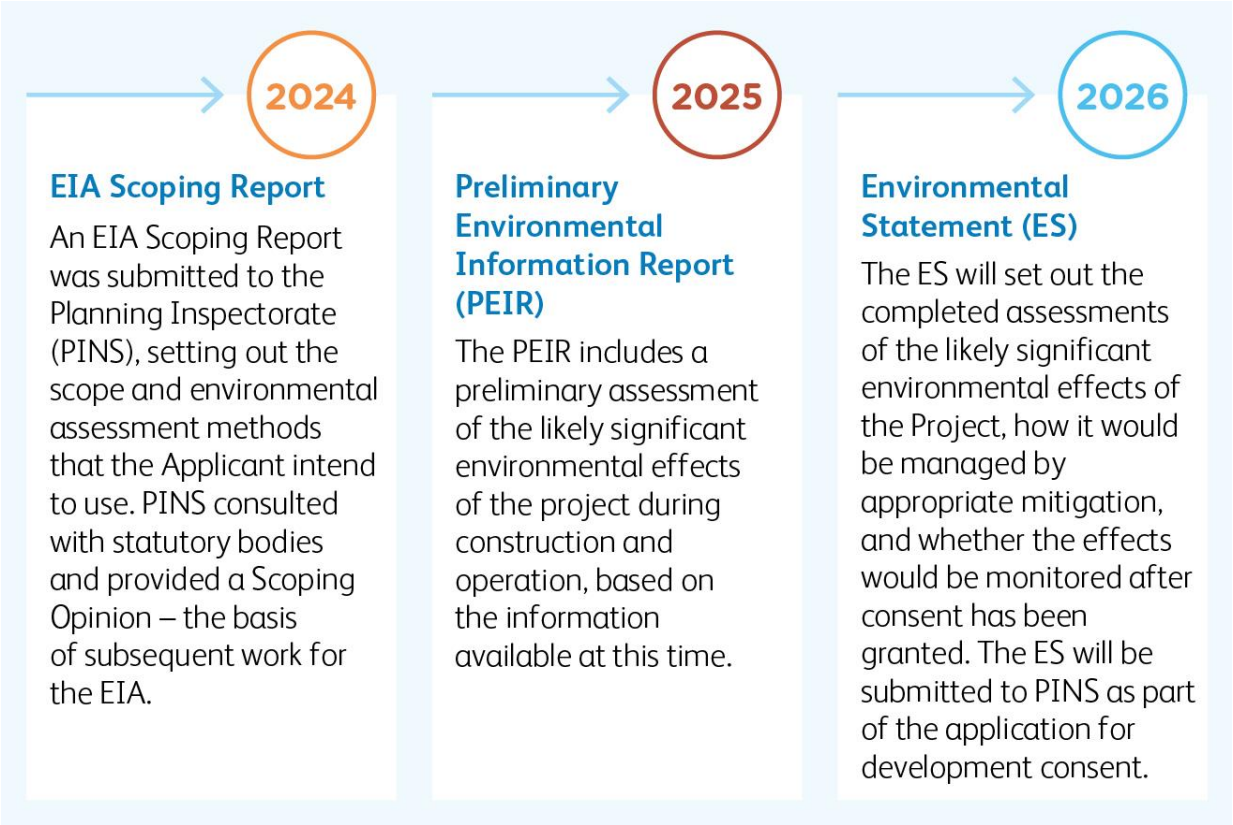
1.2.4 An EIA is required for the Project under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations), because it could generate significant environmental effects.

1.2.5 The outcome of the EIA process will be reported within an Environmental Statement (ES) that will be submitted as part of the Development Consent Order (DCO) application for the Project. The ES will build on the preliminary information set out in this PEIR.

1.2.6 During the EIA process for the Project to date, opportunities to embed sustainable design and construction principles have been identified and incorporated within the proposals wherever possible.

1.2.7 Plate 1.1 below shows Thames Water's timeline for developing the EIA.

Plate 1.1 Timeline for developing the EIA



1.3 Purpose of the Preliminary Environmental Information Report

1.3.1 The PEIR explains the current understanding of the Project's likely significant environmental effects. Its purpose is to enable local people and stakeholders to make informed consultation responses.

1.3.2 It accompanies Thames Water's statutory consultation and is a requirement of the Planning Act 2008.

1.3.3 The information presented within the PEIR is preliminary, as it does not represent a final Project design or include final environmental assessment conclusions. Ongoing design and survey work, as well as feedback received during the statutory consultation, will be used to refine the Project and improve understanding of its potential effects.

1.4 Background to the Project

1.4.1 Thames Water currently supplies around 2.6 billion litres of water per day for over 10 million customers across the South East. This water comes from rivers and natural underground sources called groundwater.

1.4.2 The South East is one of the UK's driest regions, classified by the Environment Agency as 'seriously water stressed'.

1.4.3 Pressures from climate change, population growth and environmental objectives to reduce water abstraction from ecologically sensitive water bodies,

mean that, without action, there could be a 1 billion litres per day shortfall for Thames Water's customers by 2050.

1.4.4 Severe drought restrictions could cause up to £500 million of economic damage every day, disrupt daily life and cause long-term damage to the environment and public health in London.

1.4.5 TDRA is a vital drought resilience project for London, which would be able to supply up to 75 million litres (Ml/d) of water per day during droughts. The Project would make sure London can meet government standards and become resilient to 1 in 200 year droughts. This increased resilience will reduce the likelihood of severe economic, environmental and societal impacts.

1.4.6 The Secretary of State for Environment, Food and Rural Affairs designated the TDRA as a development of national significance in December 2023 under section 35 of the Planning Act 2008.

1.4.7 This means that Thames Water needs to apply for a type of planning consent called a DCO to build and operate it. The DCO application for the Project is anticipated to be submitted to the Planning Inspectorate, the government body responsible for examining DCO applications, in 2026.

1.4.8 Following acceptance, examination and recommendation by the Planning Inspectorate, this application will then be decided by the Secretary of State for Environment, Food and Rural Affairs.

2. Project description

2.1 Overview

2.1.1 This chapter explains the regulatory process the Project has gone through to date.

2.1.2 It also defines the extent of land which the temporary construction and permanent infrastructure works will occupy. These are the draft Order limits as shown in the Map Books.

2.1.3 Further information on the proposals for permanent infrastructure works are explained for each component of the Project in this document.

2.2 Regulatory background

2.2.1 All water companies must prepare a Water Resources Management Plan (WRMP) every five years, which details how they will achieve a secure supply of water while protecting and enhancing the environment. This includes reducing leakage, supporting customers to save more water and investing in new sources.

2.2.2 The Project was originally proposed as part of Thames Water's WRMP, published in 2019 (WRMP19) and was sized to provide 300Ml/d.

2.2.3 Following consultation on the draft WRMP19, a Statement of Common Understanding between Thames Water and the Environment Agency was produced, which explained that the Project sized at 300Ml/d was not environmentally promotable at that time.

2.2.4 Thames Water committed to undertake further research into the sensitivity of the Lower Thames ecosystem to smaller schemes and viable mitigation measures that could be incorporated.

2.2.5 Thames Water investigated further and rejected options greater than 100Ml/d following guidance from the Environment Agency and due to the continued potential risk of not meeting national objectives in the Water Framework Directive.

2.2.6 The Project sized at 75Ml/d was included in Thames Water's WRMP published in 2024 (WRMP24). This was approved by the Secretary of State for Environment Food and Rural Affairs in August 2024, concluding there was a strategic need for the measures included in the WRMP, including TDRA.

2.2.7 Alongside the DCO consenting process, Thames Water is progressing the Project through the Regulators' Alliance for Progressing Infrastructure Development (RAPID)[1] gated process. TDRA has gone through three of the four gates of the process and is currently in Gate 4. On 1 April 2025, RAPID confirmed the funding to keep developing the Project further and progress towards a DCO application.

[1] RAPID is made up of Ofwat, the Environment Agency and the Drinking Water Inspectorate.

2.3 Description of the Project

2.3.1 TDRA is a drought resilience project to provide additional water for London during drought conditions. It would operate intermittently, supplying up to 75Ml/d when required.

2.3.2 The Project would typically function during low river water flow periods in the River Thames, which modelling scenarios indicate would be once every two years on average, primarily between August and November.

2.3.3 The Project involves:

a. Establishing a new abstraction intake on the River Thames approximately 350 metres upstream of Teddington Weir

b. Transferring the river water to the Lee Valley Reservoirs via the existing Thames Lee Tunnel (TLT)

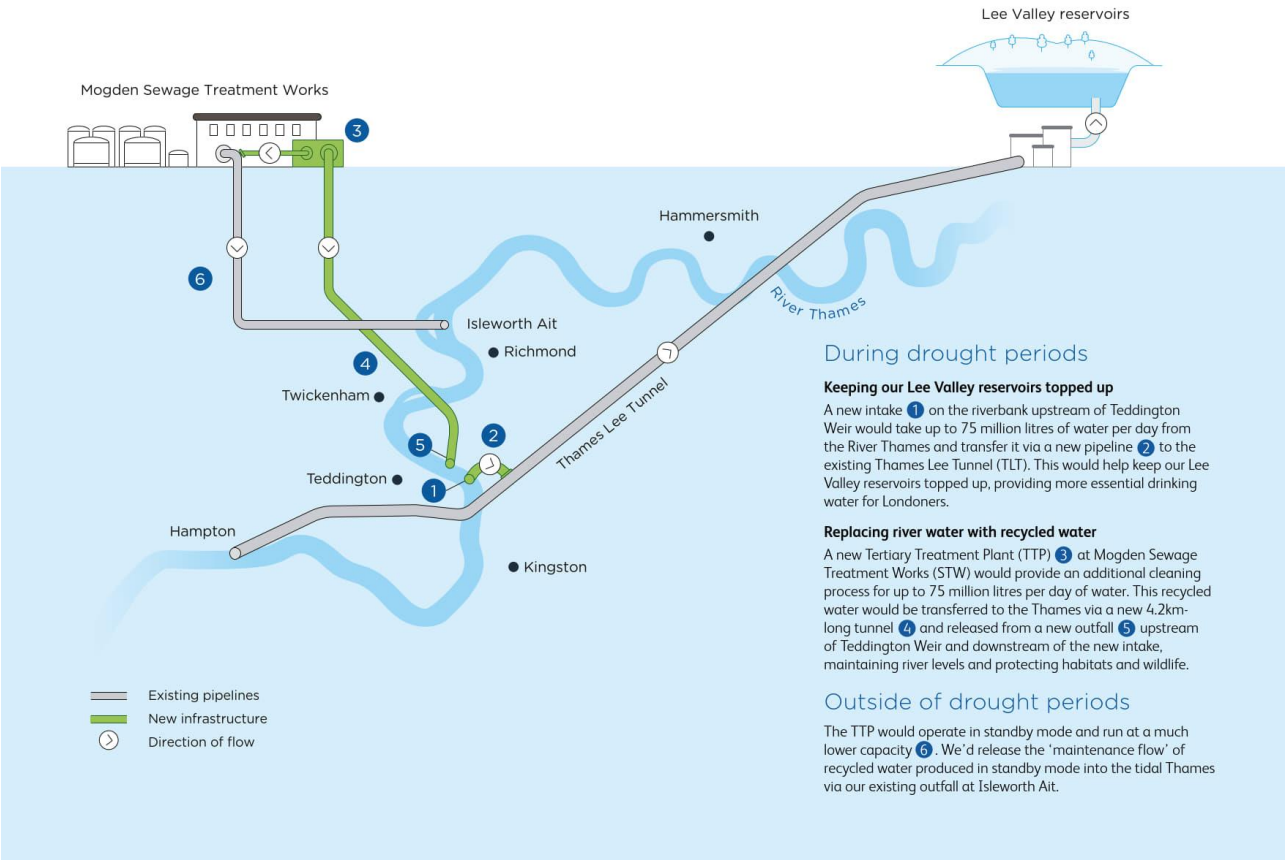
c. Recycling water using a new tertiary treatment plant (TTP) at Mogden Sewage Treatment Works (STW)

d. Transferring the recycled water from Mogden STW to the River Thames through a new 4.2 kilometre water conveyance tunnel with an intermediate access shaft in Ham Playing Fields

e. Releasing the recycled water through a new outfall approximately 180 metres upstream of Teddington Weir

2.3.4 Plate 2.1 shows how the Project will operate.

Plate 2.1 Schematic of how the Project will operate



2.4 The draft Order limits

2.4.1 The draft Order limits show all the land potentially needed to deliver the Project.

2.4.2 This comprises land needed temporarily for construction and land needed permanently to accommodate new infrastructure, including below ground tunnels. The draft Order limits also include land that can be used for landscaping and other ecological enhancements, for example to achieve biodiversity net gain.

2.4.3 Most of the land required permanently would either be within Mogden STW or underground. Only a small amount of above ground land is needed permanently for the new infrastructure, such as the proposed intake and outfall, and for maintenance access.

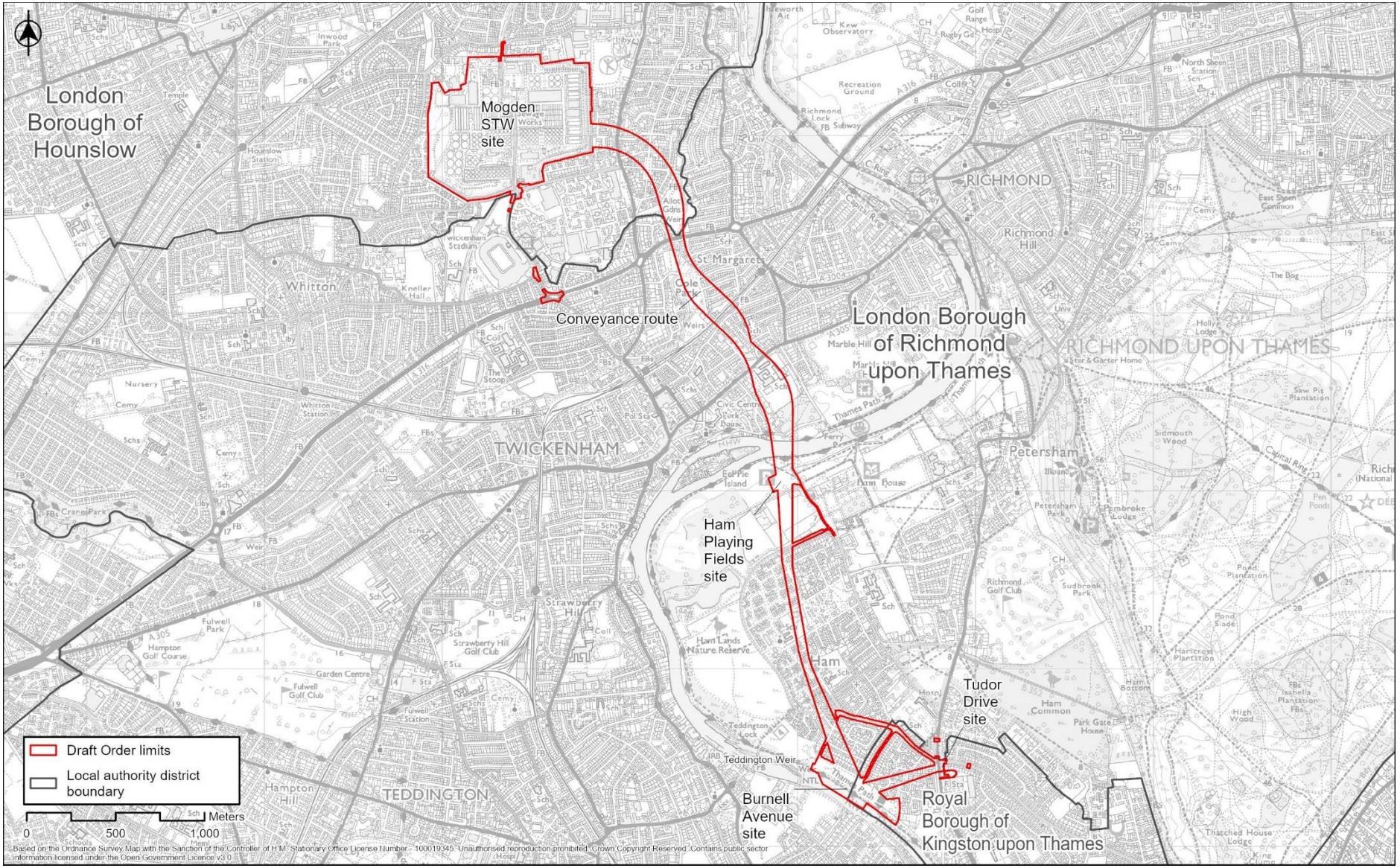
2.4.4 Depending on the topic (known as environmental aspects), assessments in the PEIR can consider environmental effects over a wider area than just the land within the draft Order limits. This ensures that effects experienced by receptors outside of the draft Order limits (e.g. noise and visual impacts on nearby communities) are assessed.

2.4.5 The study area for each aspect is based on specific guidance, as well as the receptors or resources being assessed.

2.4.6 The draft Order limits (and/or study areas) may be refined or amended following consultation and prior to the submission of the DCO application.

2.4.7 The Project's draft Order limits in Plate 2.2 and presented in detail in the accompanying Map Books and the Interactive Map, which can both be accessed via the consultation website www.thames-sro.co.uk/tdra/statcon2025.

Plate 2.2 The draft Order limits



2.4.8 There are four above ground sites included in the draft Order limits. The four sites are collectively referred to as ‘the above ground sites’ and are:

a. Mogden STW
b. Ham Playing Fields
c. Burnell Avenue
d. Tudor Drive

2.4.9 The recycled water conveyance tunnel and connection to TLT are entirely below ground.

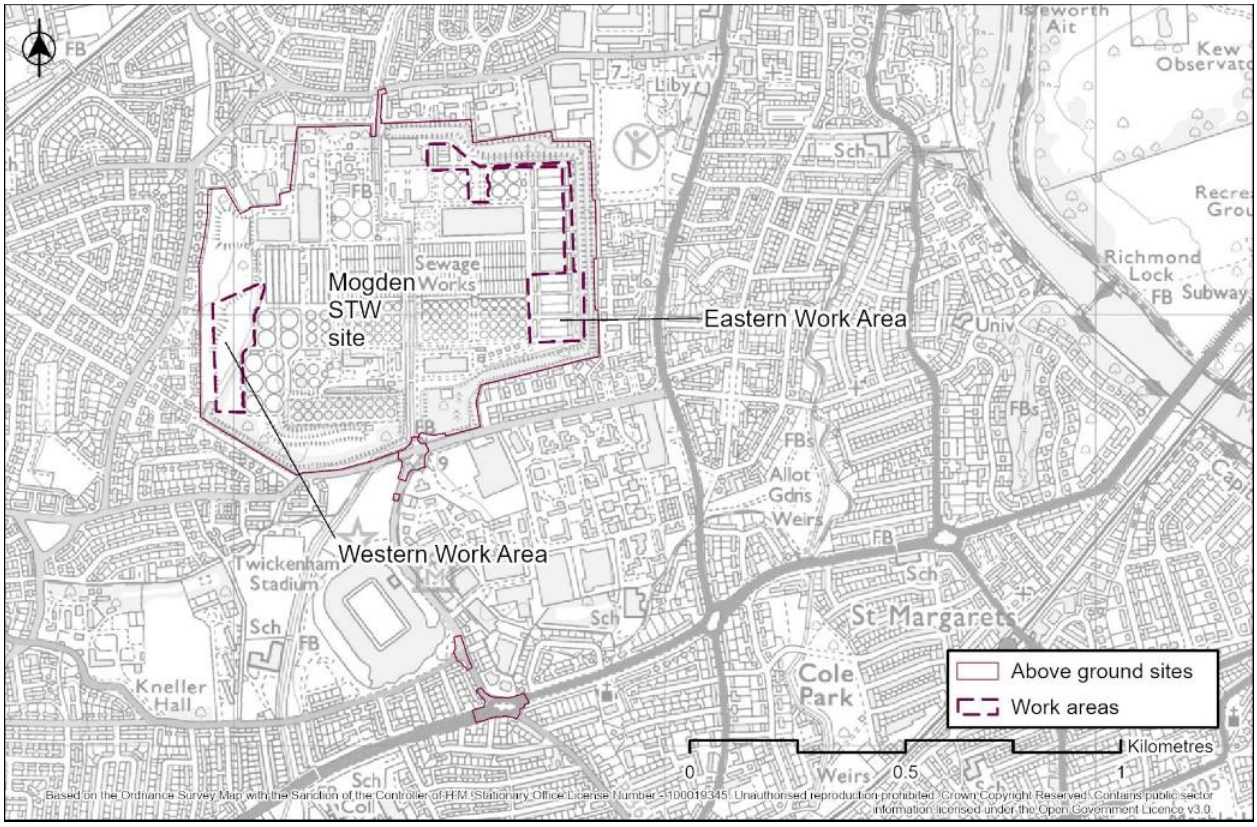
2.4.10 The following sections describe each of these.

2.5 Mogden STW

2.5.1 Mogden STW is one of the largest STW in the UK. It serves around 2.1 million customers and can treat up to 1 billion litres of wastewater every day.

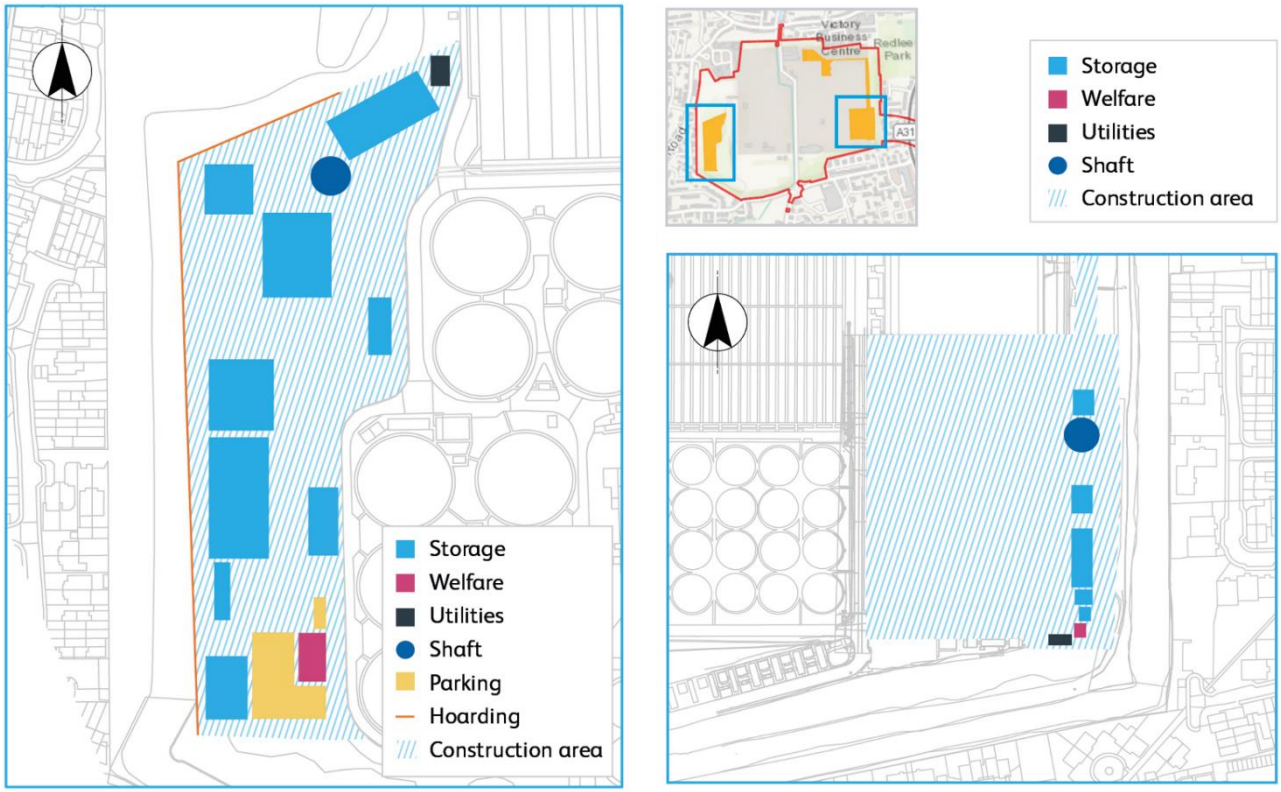
2.5.2 It is surrounded by an embankment with trees and other mixed vegetation to the north, east, south and south-west, undeveloped land to the west, and industrial and commercial business land uses to the north-west. Residential properties are in close proximity around the boundary of the entire site. The draft Order limits around Mogden STW are shown in Plate 2.3.

Plate 2.3 Mogden STW draft Order limits



2.5.3 There would be two main working areas within Mogden STW: the Western Work Area and Eastern Work Area. Plate 2.4 shows the Mogden STW indicative construction layouts at each of the Western and Eastern Work Area.

Plate 2.4 An indicative illustration of the Mogden STW temporary site compound layout at the Western and Eastern Work Area



2.5.4 The Western Work Area is on an eight metre high embankment when viewed from outside Mogden STW, and between 13 and 16 metres when viewed from inside. The embankment has a mix of woodland and grass habitats.

2.5.5 The Western Work Area would be used to build a shaft to launch the Tunnel Boring Machine (TBM), remove excavated material from the recycled water conveyance tunnel and store materials and equipment.

2.5.6 The Eastern Work Area would be used to build the TTP, as well as the ancillary infrastructure needed to operate it. It would also be used to connect the TTP to the recycled water conveyance tunnel via a new interception shaft.

2.5.7 The Eastern Work Area is located predominantly in the south-eastern corner of Mogden STW, with some extension along the east and north-east of the site. It includes an embankment, which is 155 metres wide and approximately 12 metres high around the eastern, southern and northern boundaries with mature trees and other vegetation.

2.5.8 The TTP would be built on a 5,000 metres squared platform above two storm tanks in the south-eastern corner of the site. It would be approximately 15 metres above ground level at its highest point. Section 3.3 below provides more detail about how it will operate.

2.5.9 The draft Order limits include land outside Mogden STW where modifications to local roads would be needed to accommodate delivery of the TBM. These include temporary removal of street furniture, lowering kerbs and traffic management.

2.6 Ham Playing Fields

2.6.1 There would be two sites at Ham Playing Fields in the London Borough of Richmond upon Thames – a Main Work Area and a Support Work Area. Plate 2.5 shows the Ham Playing Fields indicative construction layout.

Plate 2.5 An indicative illustration of the Ham Playing Fields temporary compound layout

2.6.2 The Support Work Area includes a small area next to Ham Street Car Park for storage as well as parking. An area of land along Ham Street would also be required to connect the Main Work Area to the road and to allow for a surface water drainage connection into the Support Work Area.

2.6.3 The Main Work Area is within Ham Playing Fields and to the west of Ham House and Garden. This site would be used for the main work compound and to build the intermediate shaft for the recycled water conveyance tunnel.

2.6.4 The intermediate shaft would have an internal diameter of approximately 10.5 metres. This would be an access shaft for health and safety, maintenance and ventilation during construction, and for inspection during operation of the recycled water conveyance tunnel.

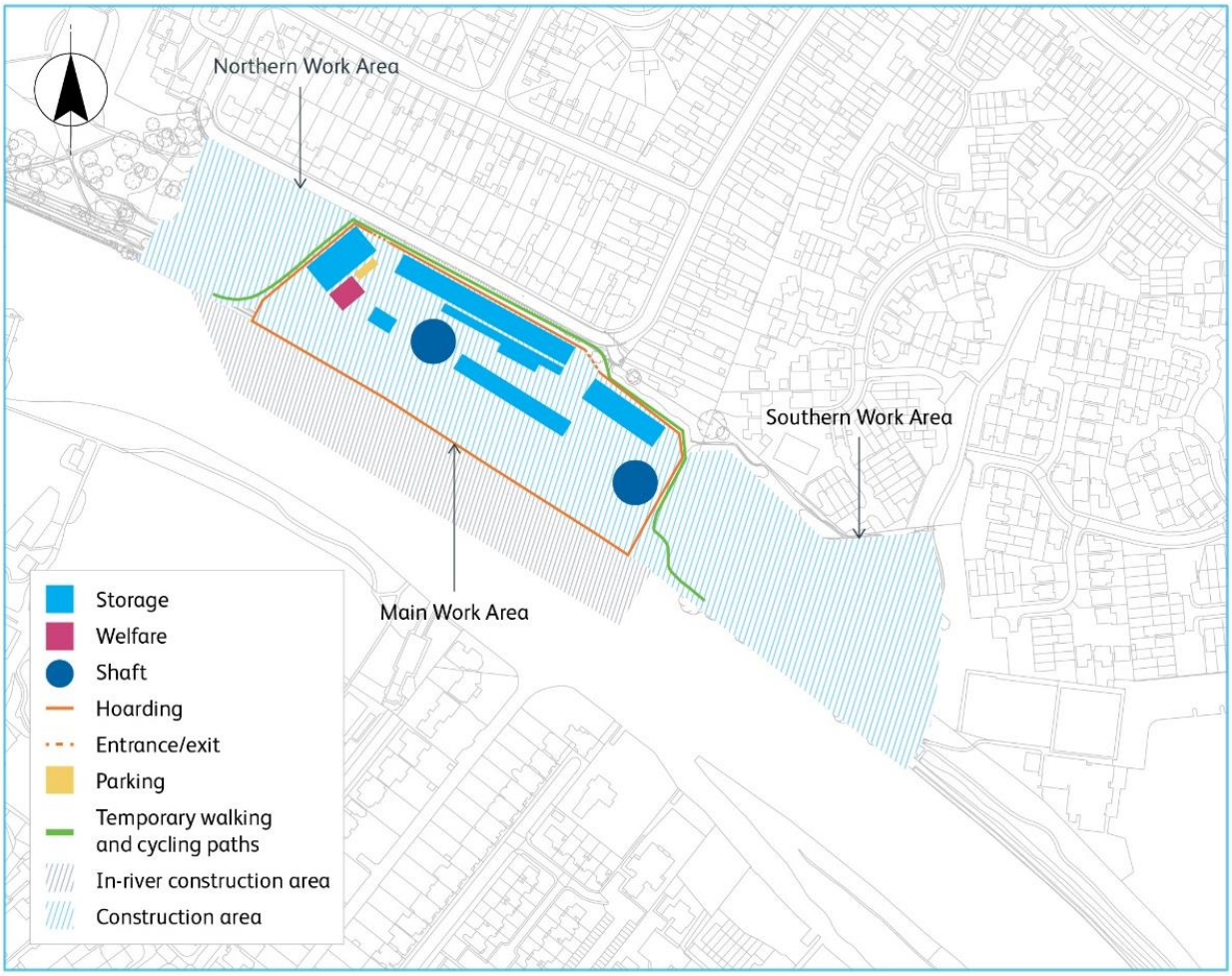
2.6.5 After construction and reinstatement, the only visible part of the intermediate shaft would be two approximately 4 metres squared access hatches. The hatches would be flush to the ground.

2.7 Burnell Avenue Site

2.7.1 The Burnell Avenue site would be on the Ham side of the River Thames and cross the boundaries of the Royal Borough of Kingston upon Thames and the London Borough of Richmond upon Thames.

2.7.2 The Burnell Avenue site would be located adjacent to and within the River Thames and include parts of the Thames Path National Trail and National Cycle Network Route 4/EuroVelo 2 – Capitals Coast Route. Parts of Teddington Lock Conservation Area and Riverside North Conservation Area are in the north and south of the site. Plate 2.6 shows the Burnell Avenue site indicative construction layout.

Plate 2.6 An indicative illustration of the Burnell Avenue site temporary compound layout



2.7.3 There are three working areas within the site: the Main Work Area, the Northern Work Area and the Southern Work Area.

2.7.4 The Northern Work Area and Southern Work Area will be used to divert public rights of way and utilities.

2.7.5 The Main Work Area will be used to build the following:

a. Intake
b. Outfall
c. Reception and connection shafts
d. Connection to the TLT
e. Temporary cofferdams that are likely to be required for construction.

2.7.6 The intake would be built approximately 350 metres upstream of Teddington Weir. This will likely be built using reinforced concrete to maintain its integrity. Its foundations will be below river level, so it is likely that cofferdams would be needed to build it (see Section 3.1 below).

2.7.7 The intake structure will adhere to best practice and existing regulations to protect fish, including the European eel, and will comply with The Eels (England and Wales) Regulations 2009.

2.7.8 It will include screens approximately three to five metres from the riverbank, subject to ongoing design work.

2.7.9 A 10.5 metre internal diameter reception shaft would be built within the Burnell Avenue site to connect the recycled water conveyance tunnel to the TLT and bring the TBM back to the surface after tunnelling has been completed.

2.7.10 Two options are being considered to connect the recycled water conveyance tunnel to the TLT. Both will require a connection shaft to be built in the Burnell Avenue site.

2.7.11 Water will flow into the connection shaft and then gravitate to the TLT via either:

a. An underground adit[2] directly from the connection shaft into the TLT within the Burnell Avenue site (referred to as the ‘Burnell Avenue TLT connection option’)
b. A 500 metre long, 2.2 metre internal diameter underground conveyance pipeline, which would connect to the TLT near Tudor Drive (referred to as the ‘Tudor Drive TLT connection option’)

2.7.12 Two options for the outfall design are being considered: a bankside outfall and a near bankside in-river outfall. Both options have chambers in the riverbank to connect to the recycled water conveyance tunnel.

2.7.13 The bankside option was consulted on during the non-statutory consultation in 2023. Following this, the near-bank solution, which moves the outfall away from

[2] An adit is a horizontal or near-horizontal tunnel to a larger underground excavation.

the river edge and marginal habitat, was developed to address concerns raised by the Environment Agency.

2.7.14 Both options are being consulted on to ensure the views of communities and stakeholders form part of the decision-making process.

2.7.15 Cofferdams are likely to be used to build the selected outfall option (see Section 3.1 below). A decision on the construction method will be made following consultation feedback and submission of the DCO application.

2.7.16 The bankside structure would be buried into the riverbank with access covers fitted flush to ground level. This would release water at river surface level, with an internal weir to prevent fish and eels entering the conveyance tunnel.

2.7.17 The near bankside in-river outfall would have one or more pipes extending approximately six to eight metres from the riverbank, on and under the riverbed, with diffusers to prevent sediment entering the pipes. This option may include in-river wooden posts and buoys to create a protective area extending roughly 15 metres from the riverbank.

2.7.18 The environmental effects of both outfall options have been considered and feedback on both options from the statutory consultation and ongoing engagement with regulators will be used to inform the design, which will be updated ahead of the DCO application.

2.8 Tudor Drive Site

2.8.1 The Tudor Drive site would be located within land owned by Thames Water, the Royal Borough of Kingston upon Thames, and the London Fire Brigade at Kingston Fire Station, at the junction of Tudor Drive and the A307 Richmond Road where there is an existing access shaft to the TLT. The land includes green space, trees and paths.

2.8.2 The site would be used in one of two ways, depending on which TLT connection option is selected. Plate 2.7 shows the Tudor Drive site indicative construction layout.

Plate 2.7 An indicative illustration of the Tudor Drive site temporary compound layout

2.8.3 If the Burnell Avenue TLT connection option is selected, the only works taking place at Tudor Drive would be strengthening works for the TLT. This would involve using the existing Tudor Drive access shaft to carry out the strengthening works inside the TLT.

2.8.4 The existing shaft at Tudor Drive is used for accessing the TLT for maintenance purposes and may not be large enough to facilitate a connection from the new raw water (river water) conveyance tunnel to the TLT. If the Tudor Drive TLT connection option is selected, and further investigations show that a larger shaft is needed, only then would the new shaft at Tudor Drive be excavated.

2.8.5 For either connection option, the strengthening works would similarly involve construction workers entering the TLT via the existing Tudor Drive access shaft.

2.8.6 If the Tudor Drive TLT connection option is selected, the pipejacking equipment would be launched from the Burnell Avenue site to construct the 500 metres raw water conveyance tunnel from the connection shaft to the TLT at Tudor Drive. The pipejacking equipment would be removed from the existing access shaft at Tudor Drive.

2.8.7 For both options, the connection to the TLT would be made during a planned shutdown. If a new shaft was needed at Tudor Drive, a permanent hatch would be installed to allow for inspection or repairs.

2.8.8 Following construction, the site would be reinstated to its existing state, including the grassland next to the fire station and the adjacent public green space, with ornamental trees and shrubs. Other features to be reinstated include paving and walls adjacent to Tudor Drive.

2.9 Recycled water conveyance tunnel

2.9.1 A new 4.2 kilometre recycled water conveyance tunnel will be built using a TBM to transfer recycled water from the TTP to the River Thames via the new outfall.

2.9.2 The tunnel would be approximately 60 metres below ground inside Mogden STW to pass under existing operational infrastructure. Outside of Mogden STW it would be between 20 and 40 metres deep. The final depth profile will be determined based on ground investigation results and more detailed design work.

2.9.3 It would have an internal diameter of about 3.5 metres and is being designed so recycled water drains back to Mogden STW when the tunnel is not being used.

2.9.4 The TBM will be launched from the drive shaft in Mogden STW and removed via the reception shaft in the Burnell Avenue site.

2.9.5 The current draft Order limits for the recycled water conveyance tunnel are wider than those that will be included within the DCO application. This is because Thames Water is carrying out further investigations and engagement with stakeholders to understand more about the ground through which the tunnels would pass. This will be used to further refine the Order limits prior to the DCO application.

2.10 How the Project has changed

2.10.1 The current proposals have developed through feedback received during the autumn 2023 non-statutory consultation, ongoing engineering design, environmental assessments, and stakeholders and regulators feedback.

2.10.2 The design will continue to develop based on feedback received during the statutory consultation in the summer of 2025, engagement with stakeholders and regulators and ongoing environmental assessments and design work.

2.10.3 Table 2.1 shows the significant changes made since the autumn 2023 non-statutory consultation.

Table 2.1 Significant changes made to the Project since the autumn 2023 non-statutory consultation

Component	Change	Rationale
Outfall	Considering a near bankside in-river option for the outfall as well as the bankside option	Based on feedback from and discussions with the Environment Agency
Recycled water conveyance tunnel	Using a TBM to build the 4.2km connection between Mogden STW and the outfall instead of using a pipejack construction technique	This will be less disruptive and only requires one intermediate shaft in the public realm rather than five
Tertiary treatment plant	Using a Moving Bed Biofilm Reactor (MBBR) rather than nitrifying sand filters	MBBR is a more robust treatment process
Tertiary treatment plant	Releasing recycled water from the maintenance flow through the existing Isleworth Ait outlet rather than through the new outfall at Teddington	The continuous TTP maintenance flow can be discharged using existing infrastructure associated with current Mogden STW final effluent discharge process
Thames Lee Tunnel connection	Connecting the intake to the TLT via an adit built from the base of the raw water connection shaft rather than including a connection shaft south of Northweald Lane	This removes the need for above ground works within land south of Northweald Lane, including the Site of Importance for Nature Conservation

3. Construction and operation

3.1 Construction

3.1.1 The above ground sites will vary in size depending on the needs of the construction programme and what is being built. All sites are likely to include:

a. Cranes
b. Materials, plant and equipment storage
c. Power and utilities
d. Site lighting for safety and security
e. Traffic management
f. Vehicle parking
g. Welfare accommodation and site offices
h. Wheel cleaning facilities

3.1.2 All sites will have hoarding or security fencing, usually 2.4 metres high, depending on the different activities and the mitigation measures being put in place (see indicative construction layouts at the above ground sites in Sections 2.5, 2.6, 2.7 and 2.8 of this NTS). Local residents and the environment will be considered when deciding the security measures (such as hoardings and lighting) at each of the above ground sites.

3.1.3 A review of multi-modal transport options for moving people, equipment and materials to and from each above ground site has been conducted. This review considered the movement of freight by river, rail and road, as well as sustainable options for the movement of the construction workforce.

3.1.4 More information on construction traffic is set out in Section 5.9 of this NTS and Chapter 12: Traffic and Transport of the PEIR.

3.1.5 The phased construction programme is expected to take approximately four years, starting in 2029 and completing in autumn 2032. Plate 3.1 shows the indicative construction timeline.

Plate 3.1 Indicative construction timeline

3.1.6 Towards the end of construction, a 15 month programme of testing and commissioning the new equipment and infrastructure would be undertaken ahead of the Project becoming operational in 2033.

3.1.7 Construction works will be programmed, where practicable, to adhere to standard working hours of the host local authorities:

a. Monday to Friday
    i. All three local authorities: 08:00 to 18:00
b. Saturday
    i. London Borough of Hounslow: 09:00 to 13:00
    ii. London Borough of Richmond upon Thames and Royal Borough of Kingston upon Thames: 08:00 to 13:00

3.1.8 Certain activities will need to take place outside standard working hours. These will require engagement with the relevant local authority, depending on the location and nature of the activity. Examples include:

a. Shaft sinking will require a 12 hour working day
b. Tunneling work at the Western Work Area as well as access to the interception and intermediate shafts for health and safety reasons will require 24/7 operation.
c. Either TLT connection option would require some 24/7 construction work at the Burnell Avenue site
d. Some concrete pours associated with the storm tanks and the TTP

3.1.9 At peak construction periods, approximately 100 workers are anticipated daily at Mogden STW, 90 at Burnell Avenue, 30 at Ham Street and 30 at Tudor Drive at any given time per shift.

3.1.10 Construction activity will include usual construction practices, such as earthworks and concrete pouring, as well as specialist activities including using cofferdams, a TBM and pipejacking.

3.1.11 Cofferdams might be needed to construct the intake and outfall. They are temporary working areas within the river connected to the riverbank.

3.1.12 Cofferdams use support and sheet piles to create a watertight area that can be drained to create a safe working area. A method to create them is to use press-in piling, although this will be determined through ground investigations and further design work. If used, the cofferdams will be removed after construction is complete.

3.1.13 The TBM will be launched from Mogden STW, and all excavated material from the tunnel would be removed via the drive shaft, which would also be used to import materials needed to construct the tunnel, such as pre-cast concrete segments. The TBM will be delivered to site in sections and assembled using cranes and other specialist equipment.

3.1.14 The TBM uses hydraulics to move along, installing pre-cast concrete segments to form the tunnel lining. It automatically grouts the gaps between the lining and the excavated ground to minimise settlement, improve stability and minimise water entering the tunnel. It will be brought back to the surface via the reception shaft at Burnell Avenue.

3.1.15 Pipejacking is a process of pushing pipes through the ground using hydraulic pistons and a boring machine.

3.1.16 Each pipe section advances through the ground one at a time; the pistons are then withdrawn to allow the next pipe section to be inserted. The process continues until the machine reaches the reception shaft at the end of the route.

3.1.17 Pipejacking would only be used for the connection to the TLT if the Tudor Drive TLT connection option is chosen (see Section 2.8). If the connection is made at Burnell Avenue, an adit excavated directly from the base of the shaft will be constructed using a spray concrete lining.

3.2 Code of Construction Practice

3.2.1 The draft Code of Construction Practice (CoCP) published as an appendix to the PEIR provides more information about the current construction proposals, including the mitigation, commitments and principles to be followed.

3.2.2 The draft CoCP focuses on setting the standard good practice (tertiary) mitigation measures that would be put in place to help manage the effects of construction. Additional (secondary) mitigation measures for significant effects will be added as the Project design develops and environmental assessments progress.

3.2.3 It is currently intended that the updated CoCP submitted with the DCO application will comprise two parts:

a. Part A: General controls. These measures are applicable Project-wide, across all construction sites and compounds.

b. Part B: Site-specific controls. These measures refine and supplement the controls set out in Part A with site-specific measures, recognising these will vary based on the location and types of activities being carried out.

3.2.4 Part B will be developed as the EIA and Project design progresses. It will confirm the mitigation measures for any locally-specific potential significant effects that have been identified in the EIA. These measures would be incorporated into the updated CoCP to accompany the DCO application.

3.2.5 Before construction begins, the appointed contractor would refine the measures set out in the updated CoCP and set these out in a Construction Environmental Management Plan (CEMP), which will include detailed aspect-specific management plans to control potential environmental impacts. This would likely need to be submitted to either the local planning authorities or the Secretary of State for their approval prior to the main construction works starting.

3.3 Operation

3.3.1 Modelling scenarios indicate the Project would typically function during low river water flow periods in the River Thames, averaging once every two years, primarily between August and November.

3.3.2 It is anticipated the trigger to start recycling water will be the same as for the strategic drought schemes in Thames Water's current Drought Plan.

3.3.3 The rules for using these measures are in the Lower Thames Operating Agreement (LTOA). The LTOA is an agreement between Thames Water and the Environment Agency which requires Thames Water to keep a certain amount of water flowing over the Teddington Weir.

3.3.4 The proposed TTP process includes ferric dosing, a MBBR, flocculation tanks and mechanical filter treatment processes.

3.3.5 Ferric dosing treats wastewater by adding chemicals which bond to particles of contaminants so they form larger clumps called flocs. Flocculation tanks are used to remove these clumps of contaminants.

3.3.6 MBBR is a widely used biological treatment process. MBBR tanks create a large surface area for microorganisms to grow and form a biofilm which then consumes pollutants in wastewater. The biofilm is constantly moving to keep it in contact with the wastewater.

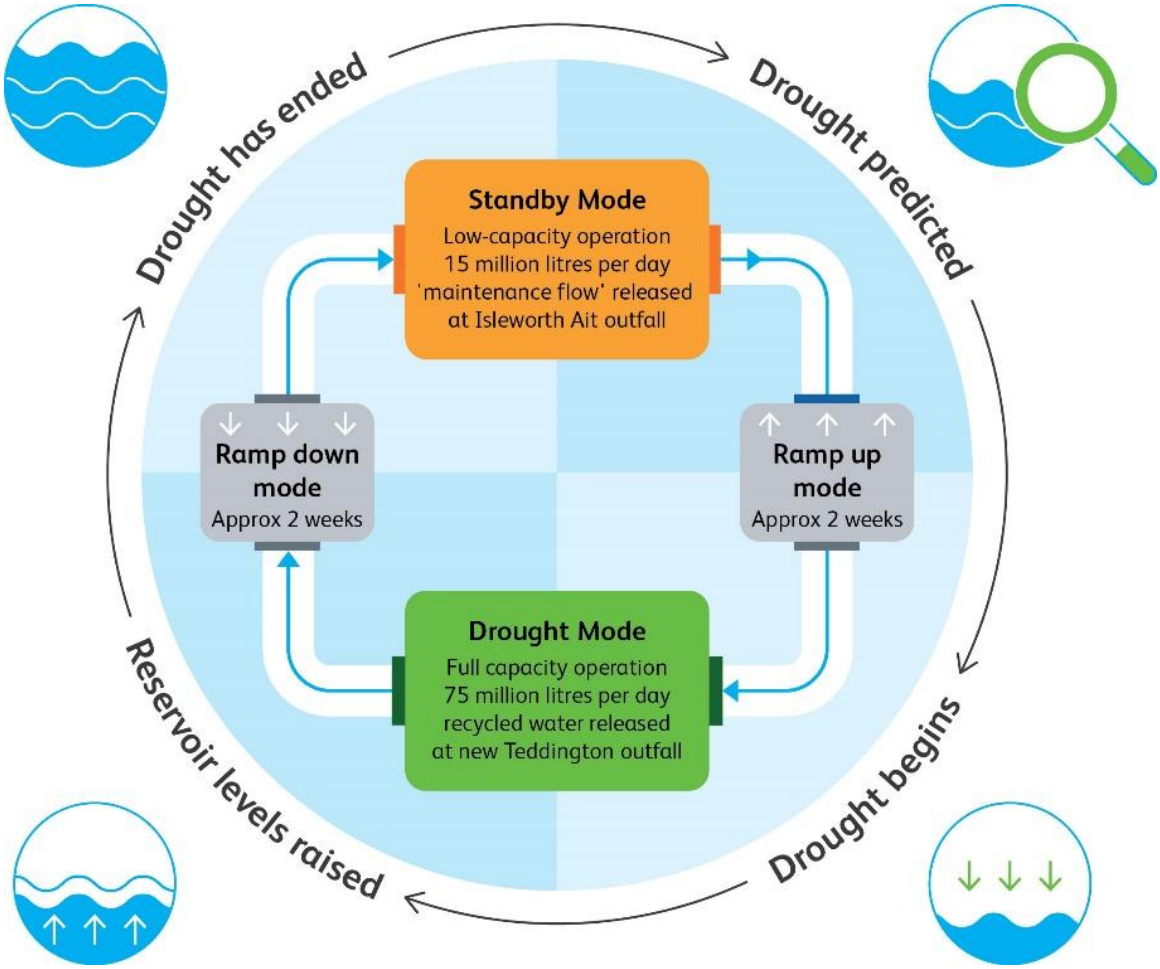
3.3.7 If operation is stopped completely during non-drought periods, the TTP would require six to eight weeks or more to re-establish biomass in the MBBR.

3.3.8 Outside of droughts, up to 15Ml/d will be recycled and released through the existing outfall at Isleworth Ait combined with the treated wastewater from Mogden STW. This is called a maintenance flow and will ensure the TTP stays in good working condition. Plate 3.2 shows this process.

3.3.9 The final design of the TTP will be informed by the results of an ongoing pilot programme (see Section 5.2).

3.3.10 There will be a need to repair and replace parts and equipment over time, but there are no current plans to decommission the Project. If the Project needs to be decommissioned in the future, environmental assessments will be completed and any necessary consents and permissions to facilitate this would be applied for.

Plate 3.2 Maintenance flow process



4. Approach to Environmental Impact Assessment (EIA)

4.1 Introduction

4.1.1 This section explains how the EIA has been developed, the environmental aspects considered and how they have been agreed.

4.2 Overview of aspects assessed and how this was agreed in EIA scoping

4.2.1 The content or scope of the EIA was agreed through the production of an EIA Scoping Report, which was submitted to the Planning Inspectorate and issue of an EIA Scoping Opinion by the Planning Inspectorate. Table 4.1 shows the environmental aspects which have been scoped in and assessed in the PEIR.

4.2.2 Where the design is still being finalised, or the aspect scope is still uncertain, the worst-case scenario has been assessed. This means the mitigations would be suitable for the final design.

Table 4.1 Environmental aspects scoped in and assessed in the PEIR

Environmental aspect	Definition
Chapter 5: Water Resources and Flood Risk	The potential impacts of the Project on groundwater sources, surface water quality and how water moves through the environment, as well as on flood risk.
Chapter 6: Aquatic Ecology	The potential impacts of the Project on ecosystems, including plants and wildlife found in and around bodies of water, such as the River Thames.
Chapter 7: Terrestrial Ecology	The potential impacts of the Project on ecosystems found on land – in particular, sites or species that are designated (protected by law) due to their significance.
Chapter 8: Historic Environment	The potential impacts of the Project on sites of archaeological value, as well as designated historic assets, such as conservation areas and listed buildings.
Chapter 9: Townscape and Visual	The potential impacts of the Project on the character and composition of the built environment including buildings and open spaces and the relationship between them – and on visual amenity including protected views.
Chapter 10: Ground Conditions and Contaminated Land	The potential impacts on the Project of ground conditions and any contamination from historical activities and land use during construction and operation.
Chapter 11: Materials and Waste	The potential impacts of the Project on production of waste during construction.
Chapter 12: Traffic and Transport	The potential impacts of the Project on traffic levels during the construction period as a result of the movement of materials and waste, and construction worker journeys.

Environmental aspect	Definition
Chapter 13: Air Quality	The potential impacts of the Project on air quality during construction and operation including from construction vehicle emissions, dust and odour.
Chapter 14: Noise and Vibration	The potential impacts of the Project on sensitive receptors (such as residential properties, schools or wildlife) as a result of noise generating construction and operational activities.
Chapter 15: Socioeconomics, Community, Access and Recreation	The potential impacts of the Project on people, businesses and public spaces during construction and operation.
Chapter 16: Human Health	The impact of the Project on human health during construction and operation.
Chapter 17: Carbon	The impacts of the generation of greenhouse gases as a result of the construction and operation of the Project and the consideration of this in the context of national targets.
Chapter 18: Climate Change	The potential impacts on the Project of predicted changes in the climate and changing weather patterns, and how resilient the Project will be to these changes.
Chapter 19: Cumulative Effects	The assessment of cumulative effects of the Project and how they interact with other proposed developments.

4.3 Measuring baseline conditions

4.3.1 The EIA considers the existing environmental baseline against the predicted or future baseline without the Project.

4.3.2 The existing baseline is established by measuring the current environmental conditions. This includes using public datasets, Thames Water's monitoring programme, desk-based assessments, walkover surveys, ground investigations and other appropriate surveys, assessments and investigations.

4.3.3 In addition, the EIA assesses the future baseline which includes the conditions that would exist in the future if the Project does not get built. When describing the future baseline for each environmental aspect, the current baseline will be developed to consider potential changes from, for example, the impacts of climate change.

4.4 Mitigation

4.4.1 The Project's approach to mitigating environmental effects is to avoid, prevent and reduce them as much as practicable using embedded design (primary) mitigation, additional (secondary) mitigation and standard good practice (tertiary) mitigation.

4.4.2 Embedded design (primary) mitigations are changes to the location or design of the Project to avoid, prevent or reduce likely significant environmental effects.

4.4.3 An example of this was the change from a pipejacking construction technique for the tunnel with five intermediate shafts, to the use of a TBM with one intermediate shaft in the public realm. This removed four construction sites from the Project and avoided associated impacts.

4.4.4 Additional (secondary) mitigations are measures or actions to prevent or reduce any remaining significant environmental effects, such as installing additional noise screening, relocating species or implementing site-specific environmental policies.

4.4.5 Standard good practice (tertiary) mitigations include actions to manage commonly occurring environmental effects. For example, root protection zones when working near trees and considerate contractors' practices that manage activities which could cause nuisance or environmental effects, such as the spillage of fuels, oils or other chemicals.

4.4.6 The draft CoCP includes more detail about the additional (secondary) and standard good practice (tertiary) mitigations across the Project.

4.4.7 When environmental effects cannot be avoided, reduced or prevented, the Project would consider compensation and offsetting activities.

4.4.8 Enhancement activities are measures to achieve net benefits which are unrelated to an adverse impact or go beyond mitigation. For example, restoring a habitat to leave it in a measurably better state than it was before the Project.

4.4.9 Compensation includes measures to make up for negative environmental impacts, loss or permanent damage to the environment by providing replacements similar to the area affected.

4.4.10 Offsetting includes positive actions to make up for unavoidable negative impacts, including activities like habitat restoration, conservation actions or creating new habitats. They may be carried out away from the impacted area or outside of the Project site, aiming to achieve 'no net loss' or 'net environmental gain' overall.

4.4.11 Mitigations proposed in the PEIR have been captured within a Commitments Register. This document shows the likely environmental effects and the measures proposed to reduce them.

4.5 Defining a significant effect

4.5.1 A development of this nature is likely to have both beneficial and adverse effects on the environment. The focus of the EIA is to identify and mitigate significant adverse effects as much as practicable through the design process.

4.5.2 Each technical aspect chapter within the PEIR explains the method to determine whether an effect is significant. In general, the significance of an environmental impact is assessed through consideration of the following:

a. The EIA Regulations
b. Other legislative requirements
c. Guidelines, standards and codes of practice including those published by the Planning Inspectorate and professional bodies
d. Advice and feedback from statutory consultees, other interested parties and independent experts

4.5.3 For most aspects, a three-step process has been used to understand the significance of effects.

4.5.4 The first step looks at the sensitivity and value of the environmental feature that would be affected (the environmental receptor). Sensitivity means how easily it could be affected by change.

4.5.5 Value is a measure of its importance in the context of the environmental aspect being assessed. For example, in terrestrial ecology terms a nationally designated site would have a greater value than a local nature reserve (LNR).

4.5.6 Depending on these criteria, each receptor is classified as having, for example, high, medium, low or negligible sensitivity.

4.5.7 The second step considers the likely scale, or magnitude, of the impact from an activity associated with the Project.

4.5.8 This is measured as the scale of the change from the baseline conditions and the duration and reversibility of the impact. The magnitude of change for each impact is classified, for example, as either large, medium, small or negligible/no change.

4.5.9 The third step uses a matrix approach and professional judgement to combine the scores for the value or sensitivity versus the magnitude of the change to determine the significance of effect.

4.5.10 Adverse and beneficial environmental effects are usually categorised as follows:

a. Not significant, which means environmental effects result in either:
    i. No change; or
    ii. Neutral or minor effects
b. Significant, which means environmental effects result in either:
    i. Moderate effects; or
    ii. Major effects

4.5.11 Where more appropriate for some aspects, a specific approach, following industry good practice, has been used to assess the environmental effects.

5. Environmental effects and mitigation

5.1 Introduction

5.1.1 This chapter summarises the effects and mitigations for each of the aspects considered as part of the EIA as well as the cumulative effects assessment at this stage. It also provides a brief overview of the approach to understanding baseline conditions and mitigation of environmental impacts.

5.1.2 Additional (secondary) and standard good practice (tertiary) mitigation will be delivered through the CoCP and CEMP. See Sections 3.2 and 4.4 above for more details.

5.2 Water Resources and Flood Risk

5.2.1 The water resources and flood risk chapter assesses the impact on groundwater, surface water quality, geomorphology and how water moves through the environment (hydrodynamics). It also assesses the impact on flood risk, including flooding from rivers, surface water, groundwater, sewers and artificial sources.

5.2.2 Drinking water quality is monitored by the Drinking Water Inspectorate and is regulated and reported separately.

5.2.3 To understand the baseline environment, datasets from the Environment Agency, Ordnance Survey, Natural England, Water Resources South East, local authorities and the British Geological Survey (BGS) have been carefully examined. Data from Thames Water's extensive water quality monitoring programme, which will be reported on in the ES, has also been used.

5.2.4 A 2-Dimensional model has been developed specifically to understand the hydrodynamic baseline of the freshwater River Thames and the impact the Project might have in the section of the River Thames 270 metres upstream of the proposed intake to immediately downstream of Teddington Weir.

5.2.5 A 3-Dimensional model has been developed to understand the hydrodynamic and water quality baseline for the tidal River Thames, focusing on 22 kilometres of the River Thames from Teddington Weir to Battersea Bridge. This model measures the potential impact of the outfall on water quality in the estuarine River Thames and water quality from the maintenance flow from the Isleworth Ait outfall.

5.2.6 To understand the baseline flood risk, detailed flow rates, flood levels and flood extents have been obtained from the Environment Agency. The Flood Risk Assessment covers flood risks from all sources to the Project, as well as whether the Project could impact flood risks in other areas.

5.2.7 The assessment of effects assumes the following embedded design (primary) and standard good practice (tertiary) mitigation measures have been included in the design and construction programme:

a. Implementing groundwater and surface water controls to avoid cross-contamination of groundwater
b. Designing the outfall and access hatches to prevent floodwater entering them
c. Ensuring the equipment is resilient against severe flooding
d. Building the recycled water conveyance tunnel through the London Clay deposits to limit risks to groundwater resources because of its low permeability
e. Installing temporary drainage at all sites to manage surface water runoff during construction and installing permanent drainage for when the site is operational
f. Developing a Flood Response Plan for each site within Flood Zones 2 and 3, and making sure equipment is stored in areas of lowest flood risk
g. Following best practice to prevent water pollution from construction sites
h. When practical, only using biodegradable hydraulic oils to maintain equipment working in or over water

5.2.8 During construction, there is potential for significant effects on groundwater flows and levels to the principal aquifer at Mogden STW and secondary A aquifer at the remaining sites. Additionally, a permanent retaining wall at Mogden STW may act as a groundwater barrier, resulting in potential significant effects during operation.

5.2.9 Furthermore, during construction, there is a potential for significant flood-related effects including fluvial flood damage or the mobilisation of plant, equipment, and materials at Ham Playing Fields during flood events. The installation of cofferdams at Burnell Avenue related to the construction of the intake and outfall could result in some fluvial obstruction. During operation, there may also be some fluvial obstruction from the river intake and any associated infrastructure that could encroach into the nearby floodplain.

5.2.10 However, during construction, no significant effects are identified on water quality, flood risk or groundwater once proposed mitigations have been implemented.

5.2.11 Similarly, following further assessment which would inform mitigation measures to be implemented, no significant effects on water quality, flood risk or groundwater are expected during the operation stage. This assessment would include impact assessment and hydraulic modelling.

5.2.12 An ongoing pilot TTP at Mogden STW is being undertaken by Thames Water, working closely with the Environment Agency, refining the understanding of which processes are most suitable for producing the quality of water suitable for discharge into the River Thames.

5.2.13 Testing started in September 2024 and will finish in November 2025, covering a range of seasons with different flow rates and parameters. The outputs from the pilot TTP are being shared with the Environment Agency.

5.3 Aquatic Ecology

5.3.1 Aquatic ecology refers to the variety of living organisms found in freshwater, estuarine and marine environments and how they interact with each other and the environment.

5.3.2 The assessment considers the impacts that the Project could have on aquatic ecology, through changes to water quality, velocity, temperature and habitat availability and restriction of movement of organisms.

5.3.3 The aquatic ecology assessment also considers the effect of potential introduction and movement of invasive non-native species (INNS) impact assessment because of the Project.

5.3.4 The study area considered for aquatic ecology starts two kilometres upstream of the intake location at Burnell Avenue (within the freshwater River Thames) and finishes at Battersea Bridge (within the estuarine tidal River Thames).

5.3.5 There are several designated sites near to the Project, including:

a. Syon Park Site of Special Scientific Interest (SSSI), which is within two kilometres of Mogden STW and approximately 7.3km downstream of the outfall location and represents a large area of floodplain swamp

b. River Thames and Tidal Tributaries Site of Importance for Nature Conservation (SINC), which contains the aquatic ecology receptors considered in this assessment

c. Isleworth Ait Local Nature Reserve (LNR), which contains the protected German hairy snail within its marginal habitat

5.3.6 Desk based studies and on-site surveys have been undertaken to understand the organisms and habitats that could be impacted by the Project. This includes small organisms, such as phytoplankton, invertebrates and algae and larger organisms including aquatic plants, fish and marine mammals. The presence and absence of invasive species has also been assessed.

5.3.7 Example mitigations could include using less impactful construction techniques such as non-percussive piling methods where practicable and feasible, designing the intake to minimise fish (including eel) ingress and including prevention measures such as cleaning and access controls to reduce the spread of invasive non-native species during construction.

5.3.8 At this stage there are no likely significant effects on aquatic ecology identified once mitigation measures have been applied.

5.3.9 Before the application is submitted, further surveys will be undertaken and engagement with environmental bodies such as the Environment Agency will

continue to ensure impacts to aquatic ecology have been considered, assessed and mitigated appropriately.

5.4 Terrestrial Ecology

5.4.1 Terrestrial ecology focuses on the diversity of land-based organisms and their interactions with each other and their environment. The assessment looks at impacts to statutory and non-statutory designated sites, notable habitats and protected species.

5.4.2 One internationally designated site is located within the study area: Richmond Park Special Area of Conservation (SAC). This is 1.1 kilometres from the draft Order limits. Due to the distance between the SAC and the Project, no direct impacts on the qualifying features within this designated site are anticipated.

5.4.3 Habitats Regulations Assessments (HRAs) are the process for determining potential for impacts on designated sites considered to be internationally important, including land outside of the Order limits which can support species for which the site is designated. This is known as functionally linked land.

5.4.4 The draft Order limits include suitable habitat for the qualifying feature of the Richmond Park SAC: the stag beetle. These suitable habitats have been assessed as being functionally linked with the Richmond Park SAC and therefore the construction activities could result in significant effects on site integrity. A Stage 2 (Appropriate Assessment) will be undertaken looking at the likely significant effects on site integrity of Richmond Park SAC associated with functionally linked land that could support stag beetles. It is anticipated that suitable mitigation can be developed and agreed with Natural England such that no likely significant effects on stag beetle would be reported. This will be confirmed in the DCO application.

5.4.5 Within the assessment study area a further two SSSIs, a National Nature Reserve (NNR) and two LNRs were identified in addition to those indicated in Section 5.3 for aquatic ecology, as summarised below:

a. Richmond Park SSSI, NNR and SINC
b. Bushy Park and Home Park SSSI and SINC
c. Ham Lands SINC and LNR
d. Ham Common LNR

5.4.6 These are a minimum of 340 metres away with the exception of Ham Lands LNR, which is located directly adjacent to the draft Order limits. With the implementation of standard good practice (tertiary) mitigations, no significant effects on these designated sites are anticipated.

5.4.7 A review of baseline conditions, including ongoing field-based species and habitats surveys, has informed the assessment for potential impacts on protected species and habitats.

5.4.8 Standard good practice (tertiary) mitigations will be applied to comply with legislative requirements or align with standard sector practices to mitigate potential effects on protected or notable species and habitats. No significant effects on protected or notable species or habitats are anticipated.

5.5 Historic Environment

5.5.1 The historic environment chapter assesses the potential impacts on buried archaeology and built heritage assets. This includes archaeology and built assets in conservation areas and registered parks and gardens, as well as listed buildings.

5.5.2 To identify designated and undesignated heritage assets, data from sources including Historic England's National Heritage List for England and the Greater London Historic Environment Record (GLHER) have been reviewed.

5.5.3 One hundred and ten designated archaeological and built heritage sites within 500 metres of the draft Order limits have been identified (above ground elements only excluding road modification areas), including:

a. Eighty-seven listed buildings (of which two are Grade I Listed, 11 are Grade II* Listed, and the remainder Grade II Listed)

b. Nine conservation areas

c. Three registered parks and gardens

d. Eleven Archaeological Priority Areas (APA)

5.5.4 There are also various non-designated assets recorded by the GLHER, Buildings of Townscape Merit recorded by the London Borough of Richmond upon Thames, and one Local Area of Special Character recorded by the Royal Borough of Kingston upon Thames.

5.5.5 Based on information to date, the assessment in the PEIR has not currently identified any significant effects on built heritage during construction or operation of the Project.

5.5.6 Walkover surveys and other assessments will be completed to further develop understanding of how the Project could impact built heritage assets. The outcomes will be reported in the ES and in mitigation plans that will be implemented during construction.

5.5.7 The only potential for significant effects on buried archaeology is at the Ham Playing Fields and the Burnell Avenue site during construction. This is because no archaeological investigations have been carried out at either site previously, therefore a precautionary assessment has been made at this stage.

5.5.8 Thames Water will carry out a non-intrusive geophysical survey at the Ham Playing Fields and the Burnell Avenue site to better understand the potential of the sites to contain buried archaeology. If needed, further investigation will be carried out and reported in the ES.

5.5.9 The results will inform any specific mitigation measures needed during construction. The scope of all archaeological surveys will be discussed in advance with the Greater London Archaeology Advisory Service.

5.6 Townscape and Visual

5.6.1 Townscape is defined as the character and composition of the built environment including buildings and open spaces, and the relationship between them. Visual effects describe likely effects on people's views and visual amenity.

5.6.2 The study area for the townscape and visual assessment extends 2.5 kilometres from the draft Order limits.

5.6.3 Desk and site-based assessments have been carried out to identify townscape character areas and people whose views might be affected by the Project.

5.6.4 Assessments have been informed by data from national and local townscape character assessments, publicly accessible open space, designated public rights of way and promoted routes, and protected and important views identified by the host local authorities.

5.6.5 Ten local townscape character areas, published by the Local Planning Authorities, have been identified for assessment within the study area, which would potentially be directly or indirectly affected by the Project.

5.6.6 Townscape and visual mitigation includes embedded design (primary) and standard good practice (tertiary) mitigation measures. Landscape proposals (such as planting) included within embedded design (primary) mitigation are illustrated on the Preliminary Townscape and Environmental Master Plan.

5.6.7 Eighteen viewpoints have been selected within the study area to focus on sensitive receptors and likely significant effects.

5.6.8 There would potentially be likely significant effects on townscape character during construction in the vicinity of the Ham Playing Fields and Burnell Avenue sites, where construction activity and vegetation removal (including removal of trees with Tree Preservation Order status and within Conservation Areas) would be in sensitive locations along the River Thames.

5.6.9 There would potentially be likely significant effects on visual receptors during construction at most of the viewpoints identified, because of the high sensitivity of the receptors and the close proximity and scale of the construction works.

5.6.10 There would potentially be likely significant effects on townscape character in the vicinity of the Burnell Avenue site during operation in winter year 1 and during summer in year 15.

5.6.11 During operation in winter year 1, mitigation planting would not yet be fully established and therefore may not provide the whole mitigation for visual effects. In summer of year 15, mitigation planting would have been established and then some of those significant effects identified at winter year 1 would not

be deemed significant. However, there would still remain the effects associated with the intake and outfall structures as urbanising features.

5.6.12 Mitigation planting would take time to establish, meaning it would have limited mitigation effect in the short term. The mitigation effect from planting would increase over time as planted trees and shrubs establish.

5.6.13 Whilst mitigation planting and other vegetation would help to integrate the Project into the townscape, the new elements in the vicinity of Teddington Lock and Weir would continue to present urbanising features within sensitive locations.

5.6.14 Likely significant visual effects during operation in winter year 1 would potentially be most relevant to receptors near Mogden STW, Burnell Avenue and Tudor Drive above ground sites, where the loss of vegetation would adversely affect the character of the view, and/or visual receptors would be in close proximity to the intake and outfall.

5.6.15 The townscape and visual receptors identified for assessment will be assessed further in the ES.

5.7 Ground Conditions and Contaminated Land

5.7.1 This aspect assess the potential significant effects of the Project from adverse ground conditions, including contaminated land, and the effects of this on human health, surface water and groundwater.

5.7.2 There is potential for ground instability due to the presence of landfills, infilled ground and existing structures. This will be considered in the detailed engineering design, supported by ground investigations where required.

5.7.3 A desk-based assessment has identified the potential sources of contamination surrounding the Project. This assessment has been informed by data from various sources, including a Groundsure report, the British Geological Survey and data received to date from ongoing ground investigations.

5.7.4 The following principal land contamination sources have been identified within 250 metres of the draft Order limits:

a. Sewage treatment works and associated infrastructure and activities at Mogden STW

b. The former aircraft factory and motor works on Richmond Road

c. Landfills and areas of infilled ground, including the infilled former gravel pits at Ham Playing Fields

d. Contaminants introduced from fuels and chemicals used during the construction process, including those which may be used in tunnel and shaft construction

5.7.5 People that could be affected include construction workers, members of the public using nearby sites during construction and people using construction sites after reinstatement. Controlled waters that could potentially be impacted

include the nearby River Thames and other surface water and groundwater features.

5.7.6 Bespoke remediation strategies will be developed and agreed with relevant authorities where unacceptable risks from existing contamination are identified from the ongoing ground investigations, subsequent assessments or during construction.

5.7.7 Throughout construction, standard mitigation procedures will prevent contamination.

5.7.8 During operation and maintenance, following standard good practice (tertiary) mitigation and implementing appropriate monitoring, controls and emergency responses will minimise impact from any spills and leaks. With the implementation of the mitigation measures, no significant adverse effects are anticipated.

5.8 Materials and Waste

5.8.1 The materials and waste chapter assesses the potential significant effects of the Project from the generation and management of waste during the construction phase. Materials from construction and operation, and waste from operation, have been scoped out of the PEIR, as they are relatively small quantities compared to the supply of materials and landfill capacity.

5.8.2 A desk-based assessment has been completed to establish existing baseline conditions. This is focused on landfills within the local region and their capacity to accept waste generated by the Project.

5.8.3 Mitigation has helped avoid or reduce impacts from waste generation and management. This includes applying waste hierarchy and circular economy principles, reusing, recycling and recovering non-hazardous waste and importing materials in a way that reduces the risk of surplus materials being discarded.

5.8.4 The most significant waste produced by the Project will be excavated materials which, depending on quality, would be reused, recycled or disposed of.

5.8.5 Other wastes produced during construction are expected to include: soils, green waste, construction waste (avoidable and unavoidable), small quantities of hazardous oils, paints and Waste from Electrical and Electronic Equipment, packaging wastes, wood/timber waste, waste metal and Municipal Solid Waste from site offices.

5.8.6 The materials and waste assessment has concluded there would not be a significant effect resulting from the construction waste generated by the Project.

5.9 Traffic and Transport

5.9.1 The traffic and transport chapter assesses the likely significant effects of the Project from traffic generated on the local roads, the adjacent road network, and on pedestrian, cycle and public transport routes within the surrounding area.

5.9.2 A review of modal transport options for moving people, equipment and materials to and from each above ground site has been conducted. This review considered the movement of freight by river, rail and road, as well as sustainable options for the movement of the construction workforce.

5.9.3 River freight is unlikely to be viable due to the need to construct, remove and reinstate temporary loading facilities, as well as the impact on water levels on the freshwater Thames due to the passage of barges through the locks and the impact on other users of the river.

5.9.4 The use of the closest railheads, in Brentford to the north of the River Thames and Tolworth to the south of the River Thames, would reduce longer distance heavy goods vehicle (HGV) traffic, but would not change the number of HGVs entering and exiting the construction sites.

5.9.5 A desk-based analysis of the existing local road network, major road network (MRN) and strategic road network (SRN) in the study area has been undertaken to determine the likely routes construction HGVs would use.

5.9.6 To minimise impacts, this analysis is broadly based on the shortest routes from the construction sites to the permitted London Lorry Control Scheme (LLCS) freight routes, and using these permitted routes to connect to the SRN, including the A3 and M3 for access to the M25. These also include the shortest routes to the identified railheads. These routes are identified in the affected road network.

5.9.7 Table 5.1 shows the estimated total number of HGVs for each construction site and the maximum estimated number of HGVs per day. Each ‘HGV’ comprises a trip to and away from the site.

5.9.8 The estimates for HGV numbers in Table 5.1 are the ‘worst-case’ scenario for south of the River Thames, with the Tudor Drive TLT connection being selected. The actual number of HGVs needed during construction might be lower than these, with the numbers being refined as logistics plans are developed.

Table 5.1 Total construction HGV movements

Construction site	Total HGVs across the entire construction period	Estimated maximum anticipated HGVs per day
Mogden STW site	In: 23,943 Out: 23,943 Total: 47,886	In: 50 Out: 50 Total: 100
Ham Playing Fields site	In: 1,158 Out: 1,158 Total: 2,316	In: 9 Out: 9 Total: 18
Burnell Avenue site	In: 3,123 Out: 3,123 Total: 6,246	In: 16 Out: 16 Total: 32
Tudor Drive site	In: 657 Out: 657 Total: 1,314	In: 6 Out: 6 Total: 12

5.9.9 A Construction Workforce Travel Plan, included in the CoCP, would be produced and implemented by the contractor to reduce the number of single-occupancy vehicles travelling to and from the construction sites, reducing traffic volumes and the amount of car parking needed.

5.9.10 There are some potential moderate and one major significant adverse effects identified in the preliminary traffic and transport analysis, which are generally related to road safety, hazardous loads and abnormal loads including the impact of diversions to the pedestrian and cycle routes around the Burnell Avenue construction site. Along with the construction traffic using the existing lightly trafficked local roads that connect the construction sites to the adjacent A-roads.

5.9.11 Mitigations implemented to reduce these effects will include:

a. A Construction Traffic Management Plan (included in the CoCP)

b. A Construction Workforce Travel Plan (included in the CoCP)

c. Compliance with Construction Logistics and Community Safety (CLOCS)

d. Adherence to the Considerate Contractors Scheme

5.9.12 Subsequently the summary of residual effects concluded that with embedded design (primary) and additional (secondary) mitigation, there are no likely significant residual adverse effects.

5.9.13 No hazardous materials have been identified at this stage. If any are identified, they will be managed according to standard practice as set out in The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended).

5.9.14 A low number of Abnormal Indivisible Loads (AILs) are anticipated (such as large construction plant and pieces of the TBM).

5.9.15 All AIL movements will be controlled through the National Highways Electronic Service Delivery for Abnormal Loads (ESDAL) process. The impact of diversions needed for the AILs will be managed by the timing of deliveries and temporary road closures.

5.9.16 As agreed in the EIA Scoping Opinion, operational traffic and transport has been scoped out of the PEIR, as no significant HGV and car trips are expected during operation.

5.10 Air Quality

5.10.1 The air quality chapter assesses the likely significant effects of the Project on air quality and odour.

5.10.2 A desk-based assessment has been completed to identify existing background concentrations of pollutants.

5.10.3 This assessment has been informed by the London Air Quality Monitoring Network, the local authorities' monitoring campaigns, the UK Eutrophying and Acidifying Atmospheric Pollutants monitoring network, the Air Pollution Information System and Department for Environment, Food and Rural Affairs (Defra) Background Mapping data for local authorities.

5.10.4 Air quality conditions are influenced mostly by emissions from roads, marine emissions and other existing commercial and industrial sources.

5.10.5 All three local planning authorities have declared their entire boroughs as Air Quality Management Areas due to road traffic emissions. There are also several Air Quality Focus Areas nearby.

5.10.6 Further assessment of the potential air quality effects of the Project will be undertaken, including the results of a six-month baseline monitoring survey that started in April 2025.

5.10.7 During construction, the preliminary assessment indicates that exhaust emissions from construction vehicles, machinery and generators, as well as construction dust and odours could be generated but will not be to significant environmental effects. Following standard practices and mitigation measures detailed in the draft CoCP, the air quality assessment has concluded that effects would be not significant.

5.10.8 An odour risk assessment has been completed, which has determined that there would be no significant odour effects due to the operation of the TTP.

5.11 Noise and Vibration

5.11.1 The noise and vibration chapter assesses the likely effects of noise and vibration from the construction and operation of the Project on sensitive receptors within the draft Order limits and surrounding area.

5.11.2 A desk-based assessment has determined the general noise levels around the Project area. This has been informed by data from London Heathrow Airport noise contour maps and road traffic noise contour maps from Defra.

5.11.3 Baseline noise surveys have been undertaken on the eastern and western side of Mogden STW, both representative of the closest sensitive receptors.

5.11.4 These surveys indicated a dominance of aircraft noise, with noise from Mogden STW only just audible. Further noise surveys may be undertaken to gain further understanding of the baseline noise levels.

5.11.5 Mitigation within the design has helped avoid or reduce impacts from noise and vibration. This includes measures such as removing the need for pumps at the intake and outfall structures and locating the single intermediate shaft site away from residential areas.

5.11.6 The preliminary noise assessment has identified likely significant adverse temporary construction effects on residential properties that lie within 85 meters of the works to the south and east of the site on Bankside Close, Hilary Drive, Trevors Close and Beaumont Place. These preliminary effects are due to the elevated daytime noise level during the temporary embankment and foundation piling in the Mogden STW Eastern Work Area which would last for three and a half and six months respectively.

5.11.7 The preliminary noise assessment has also identified significant adverse temporary construction noise effects on residential properties within 95 meters of the work on Wainright Grove and Harvesters Close. These preliminary effects are due to night time construction activities associated with servicing the tunnelling construction activities from the Western Work Area in Mogden STW.

5.11.8 Piling to create the in river construction area at the Burnell Avenue site would have temporary significant adverse effects on residential properties within 85m of the works on Dysart Avenue and across the River Thames at Broom Water West. The construction of the cofferdam would take five weeks with the piling taking approximately two weeks of that period.

5.11.9 Similarly significant night time noise effects are predicted for residential properties within 60 meters of the works on Dysart Avenue and Biggin Hill Close. These preliminary effects are associated with the servicing of the construction activities (for example the removal of excavated materials) during the construction of the Thames Lee Tunnel adit and conveyance pipeline. The nighttime adit works would have a construction duration of six and a half months while the conveyance pipeline connection would have a construction duration of three months.

5.11.10 Preliminary vibration assessment from the temporary construction piling works in the Eastern Work Area of Mogden STW could cause significant adverse effects on nearby residents and Medex Health. No damage to buildings from vibration is predicted.

5.11.11 Further assessment and mitigation will be explored as part of the assessment included in the ES. Measures to reduce the noise and vibration impact from construction works will be set out in the CoCP.

5.11.12 The preliminary assessment of groundborne noise and vibration effects from the TBM conclude that it is unlikely that tunnelling associated with the Project would result in significant effects on residents.

5.11.13 A preliminary assessment of the effects of construction traffic on noise concluded that it was unlikely that there would be significant noise effects due to the small contribution the project traffic would make to the overall traffic numbers.

5.11.14 Further quantitative assessments of groundborne noise and vibration from the TBM associated with construction traffic will be undertaken as part of the ES.

5.11.15 During operation of the Project, there are not anticipated to be any likely significant adverse effects from noise and vibration at the closest sensitive receptors.

5.12 Socioeconomics, Community, Access and Recreation

5.12.1 Socioeconomics, community, access and recreation effects include, but are not limited to, impacts to the local economy, services and recreation.

5.12.2 To understand the socioeconomic effects of the Project, baseline data were collected on the size of the economy. The construction industry in Greater London had an output of £31.3 billion in 2024, of which 11% can be attributed to the infrastructure sector.[3] In 2023, 5.7% of London's workforce was employed in the construction sector.[4]

5.12.3 A desk-based survey informed by various sources including census data, data from the Office for National Statistics and data from the Ordnance Survey has been carried out to identify receptors within the study area.

5.12.4 Receptors include residential property, community receptors (e.g. village halls, schools, etc.) and commercial receptors (e.g. businesses). In addition, several local recreational receptors such as environmental conservation groups and other residents' societies, as well as National Trails including the Thames River Path and National Cycle Network have been considered in the assessment.

[3] Office for National Statistics, (2025). Output in the construction industry: sub-national and sub-sector reference tables. Quarter 4 (October to December 2024).
[4] Office for National Statistics, (2024). Employment by Industry, Borough.

5.12.5 To better understand the impact of the Project, a series of recreational surveys have been undertaken. These include in-person interviews with recreational users, and observational studies to capture activity types and user numbers.

5.12.6 During construction, potential significant adverse effects on recreation have been identified in the preliminary assessment for Burnell Avenue Open Space and for users of the River Thames at Burnell Avenue.

5.12.7 During construction, diversions will be implemented for public rights of way where practicable to ensure some accessibility is maintained. Mitigation measures will also be developed to minimise disruption and support access to alternative recreational spaces in the area during construction.

5.12.8 During construction there is the potential for significant effects associated on community amenity at all sites and during operation around Burnell Avenue. A more detailed assessment of community amenity effects will be completed as part of the ES.

5.12.9 During operation, potential significant adverse effects have been identified for Ham Playing Fields due to restriction of site use for recreational purposes. At Burnell Avenue, there is also potential for adverse effects to the users of the River Thames associated with in river loss of space available for recreation. This assessment will be refined as designs for the Project develop and will be included in the ES.

5.12.10 Measures will be developed as part of the design development to mitigate potential significant adverse effects identified in this preliminary assessment.

5.12.11 Likely significant beneficial effects have been identified for the economy associated with the wider economic benefits of drought resilience for Greater London during operation.

5.13 Human Health

5.13.1 The human health assessment considers the likely significant effects on the health of people in communities local to the Project based on information available at this stage.

5.13.2 A desk-based assessment has been carried out to understand potential impacts across different population groups, informed by population health profiles for each location of the Project.

5.13.3 The assessment considers how the Project would impact on various wider determinants of health. Wider determinants of health means the aspects of the physical, social and economic environment which have an influence on people's health.

5.13.4 Consideration has been given to the relative sensitivity for each population group. Population sub-groups such as the young and old, those who may be socially disadvantaged or people who may have existing poor physical and mental health, can be more sensitive to certain types of health effect.

5.13.5 During construction, likely significant effects on human health have been identified for the neighbourhoods surrounding Mogden STW, particularly from noise which can cause temporary changes in quality of life from annoyance and sleep disturbance.

5.13.6 The presence of construction compound hoarding and on-site facilities at the Burnell Avenue site is likely to have temporary significant adverse health effects, such as stress, due to a temporary impact to quality of life from changes to the attractiveness of green space and the riverbank. Residents with riverside views are most likely to be affected.

5.13.7 Operational health impacts associated with the wider determinants of health of 'open space, leisure and play', 'community identity', 'education and training', 'water quality' and 'air quality' are not yet assessed in detail, as investigations are ongoing. Impacts on these determinants are expected to be relatively localised and will be reported in the ES. It is not likely that there would be significant population health effects.

5.14 Carbon

5.14.1 Greenhouse gas (GHG) emissions (also referred to as carbon emissions[5]), contribute to climate change. A preliminary assessment of the carbon emissions associated with the construction and operation of the Project has been undertaken.

5.14.2 Carbon emissions are usually presented in units of tonnes of carbon dioxide equivalent (tCO_2e). UK carbon emissions in 2023 (the latest data available) were estimated at 385 million tonnes of carbon dioxide equivalent ($MtCO_2e$).

5.14.3 Water sector operational emissions were approximately $3.1MtCO_2e$ in 2022 (the latest data available), approximately 0.8% of UK emissions. Thames Water's operational emissions for the financial year 2023/24 were approximately $0.35MtCO_2e$.

5.14.4 The UK government has an overall target of achieving net zero carbon emissions by 2050 along with interim legal targets, known as carbon budgets.

5.14.5 Although there are no local-level legal carbon targets, the Project developed carbon budgets for the local authorities using a tool from the Tyndall Centre for Climate Change Research to feed into the assessment process.

5.14.6 A preliminary assessment of the Project's estimated carbon emissions during construction and 60 years of operation would be $0.044MtCO_2e$ and $0.015MtCO_2e$, respectively. A more detailed assessment will be carried out for the ES.

[5] The assessment has considered emissions of the seven GHGs that directly contribute to climate change, namely: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride and sulphur hexafluoride. As each of these GHGs have a different Global Warming Potential (GWP), emissions of GHGs have been expressed throughout the assessment as emissions of carbon dioxide equivalent (CO_2e), i.e. the equivalent amount of CO_2 with the same GWP. To be consistent with the terminology used in relevant national, regional and local policy, emissions of GHGs are referred to as 'carbon' emissions.

5.14.7 The assessment indicated that changes in carbon emissions because of the Project would be unlikely to have a material impact on the UK's carbon reduction targets. It also indicated that local carbon emissions from the Project are extremely small in comparison to the derived local carbon budgets.

5.14.8 While embedded design (primary) mitigation and standard good practice (tertiary) mitigation will reduce the Project's carbon emissions, they would not fully contribute to decarbonisation in line with local and national policy goals for this type of project.

5.14.9 On this basis, the estimated changes in carbon emissions associated with the Project are considered to fall short of fully contributing to the UK's trajectory towards net zero. At this stage, these impacts would represent a moderate adverse significant effect. However, a Carbon and Energy Management Plan is being developed which will include additional mitigation measures, so carbon emissions associated with the Project are as low as reasonably practicable. Following the implementation of these additional mitigation measures, which will be presented fully in the ES, the residual effect of the Project on carbon emissions is not expected to be significant.

5.15 Climate Change

5.15.1 To assess potential impacts to the Project from climate change, an assessment has been carried out which considers the effects of changes in temperatures, sea level rise, rainfall patterns and storms across the next century.

5.15.2 The assessment focusses on the effects of climate change on the Project's operation and includes weather resilience measures for construction.

5.15.3 London's current climate typically includes warm and dry summers and cold and wet winters, with occasional heatwaves, intense heavy rainfall and storms. London can experience significant changes between seasons.

5.15.4 Future average temperatures are projected to increase by approximately 4ºC by the 2080s, resulting in hotter, drier summers and warmer, wetter winters and an increase in the frequency, duration and peak temperatures of heatwaves.

5.15.5 Future summer rainfall is projected to decrease by approximately 37% by the 2080s, leading to more prolonged droughts. Future winter rainfall is projected to increase by approximately 20% by the 2080s. Rainfall is likely to become more intense, leading to greater frequency and severity of flooding.

5.15.6 Sea levels will continue rising, by approximately 0.7 metres through to the end of the century, leading to changes in tidal flooding within the Thames Estuary.

5.15.7 Climate projection data and flood risk modelling will continue to inform design decisions to increase the Project's resilience. This will include using future data for specifications of structures and buildings, including capacity for the process equipment to be upgraded and adapted as the climate changes.

5.15.8 Climate projection data are also being used to understand how effects on the local environment may be different in the future. For example, the effects of droughts and floods on the River Thames will be considered within the modelling of water quality effects as part of a future baseline.

5.15.9 The main effects on construction could be disruption and damage to the construction works due to heatwaves, floods, droughts and storms. Standard good practice weather resilience measures will be used to mitigate these impacts and it is considered unlikely that that they would lead to a significant effect.

5.15.10 Potential effects on the operation of the Project are being further assessed to identify ways they can be managed, both through the design and long-term monitoring and management.

5.16 Cumulative Effects

5.16.1 The assessment of cumulative effects examines the intra-project and inter-project cumulative effects on environmental, social and economic factors.

5.16.2 Intra-project effects are the relationships between the different environmental impacts associated with the Project affecting the same receptor.

5.16.3 At this stage, no significant intra-project cumulative effects have been identified between the environmental aspects during the construction or operation phase. This will be reviewed again in the ES once the environmental assessments have been finalised.

5.16.4 Inter-project effects mean the potential for effects of the Project to combine with effects from other developments (referred to as ‘the cumulative schemes’).

5.16.5 For inter-project cumulative effects, a ‘Long list’ of existing and/or approved developments (from 1 June 2019 to 27 March 2025) within ten kilometres of the Project has been produced and is provided in Chapter 19: Cumulative Effects.

5.16.6 Threshold criteria have been used to establish a ‘Short list’, considering the potential for cumulative effects based on overlapping construction timelines, and the scale, type, proximity and nature of the cumulative developments.

5.16.7 The main potential for inter-project cumulative effects is between the Project and the River Thames Scheme if construction activities are concurrent. This will be explored further as part of the ES.

6. Next steps

6.1.1 Thames Water is holding a statutory consultation on its latest proposals from 17 June to 26 August 2025.

6.1.2 The PEIR aims to provide members of the public, statutory consultees and other stakeholders with the information to develop an informed view of the likely significant environmental effects of the Project.

6.1.3 Thames Water has produced other material to help members of the public and stakeholders develop an informed view of the Project, including a consultation brochure, Map Book and interactive map.

6.1.4 All the materials are available via the consultation website www.thames-sro.co.uk/tdra/statcon2025.

6.1.5 All feedback will be carefully considered and used, alongside results from ongoing surveys, ground investigations and the TTP pilot programme, to update the Project design. This will then inform the ES and other documents submitted as part of the DCO application, which is expected to be submitted in summer 2026.

6.1.6 As part of the DCO application, a Consultation Report will be prepared outlining how regard has been had to feedback received through statutory consultation to inform the updated design.

6.1.7 The Planning Inspectorate will examine the application and make a recommendation to the Secretary of State for Environment, Food and Rural Affairs about whether the DCO should be granted. If granted, approval of the DCO is expected in late 2027 ahead of construction starting in 2029.

7. Glossary

Term	Definition
Abnormal Indivisible Load (AIL)	A large load which cannot be divided for road transportation.
Additional (secondary) mitigation	Modifications to the location or design of the Project which are a result of design evolution. Modifications which are an inherent part of the Project design for the purpose of avoiding, preventing or reducing likely significant environmental effects. For example, reducing the height of a development to reduce visual impacts or inclusion of areas of habitat planting in the design to mitigate ecological impacts.
Affected Road Network (ARN)	The network of roads that may be impacted by traffic or environmental changes, such as pollution or congestion.
Air Quality Focus Area	A designated area where air quality issues are a priority and require focused management.
Amenity	A feature of a place that enhances the quality of life for a community, such as parks, public spaces, and other services.
Archaeological Interest	There will be archaeological interest in a heritage asset if it holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.
Archaeological Potential	An estimate based on the available evidence of the likely presence of buried archaeological remains within a specific site or area. This taking into account previous impacts from development or other historic processes such as agriculture or quarrying which can have a negative impact on the survival of archaeological remains.
Archaeological Priority Area (APA)	An APA is a defined area where, according to existing information, there is significant known archaeological interest or particular potential for new discoveries. APAs are set out in the London boroughs' local plans. They inform the practical use of national and local planning policies for the recognition and conservation of archaeological interest. The Greater London APAs are based on evidence held in the GLHER. APAs are not considered heritage assets in their own right, they simply identify areas where heritage assets with archaeological interest may be present.
Avoidance and prevention	Design and mitigation measures to prevent the effect (e.g. alternative design options or avoidance of environmentally sensitive sites).
British Geological Survey (BGS)	A partly publicly-funded body that provides technical advice to public and private sectors and aims to advance geological knowledge of the United Kingdom.
Carbon	Greenhouse gases

Term	Definition
Carbon budget	A carbon budget is the cumulative amount of carbon emissions permitted over a period of time to keep within a certain temperature threshold.
Carbon dioxide equivalent	A measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.
Circular economy	Circular economy is a systems-based approach that prioritises the elimination of waste and enabling the continual use of resources by designing for durability, adaptability, reuse and recovery. It involves looking at the entire asset lifecycle, promoting a circular flow of resources at their highest value to reduce environmental impact and deliver positive long-term economic and social outcomes.
Code of Construction Practice (CoCP)	A set of guidelines or principles that will be adhered to during the construction of the Project.
Commitments Register	A document that records and tracks all environmental and social commitments made by a project or organisation, ensuring accountability and compliance with regulations and stakeholder agreements.
Compensation	Measures taken to make up for the negative environmental impacts, loss of or permanent damage to, resources through the provision of replacement areas, similar to those lost.
Contaminated land	Land that contains substances which, when present in sufficient quantities or concentrations, are likely to cause harm to human health or the environment.
Controlled waters	Bodies of water protected by law, including inland freshwaters, groundwaters and coastal waters. These are regulated to prevent pollution and maintain water quality.
Construction Logistics and Community Safety (CLOCS)	The National Standard for ensuring the safest journeys for construction vehicles, focusing on reducing risks to vulnerable road users, improving air quality and congestion, and enhancing operational efficiencies.
Cumulative effects assessment	An assessment that considers the potentially significant environmental effects of a project with those of other existing and/or approved projects, and the combined environmental effects interacting with one another within the Project.
Defra	The UK government department responsible for policy and regulations on the environment, food and rural affairs
Development Consent Order	This is the decision of the competent authority or authorities which entitles the applicant to proceed with the project (IEMA, 2022a).

Term	Definition
Direct River Abstraction	The process of extracting water directly from a river for consumption or use.
Draft Order limits	The draft spatial boundaries of the Project.
Dry spell	Not formally defined but generally considered a period of 15 or more consecutive days to none of which is credited 1.0mm or more of precipitation (as defined by Met Éireann).
Effluent (Trade Effluent)	Any liquid, either with or without particles of matter in suspension in the liquid, which is wholly or partly produced in the course of any trade or industry carried on at trade premises; and in relation to any trade premises, means any such liquid which is so produced in the course of any trade or industry carried on at those premises, but does not include domestic sewage.
Electronic Service Delivery for Abnormal Loads (ESDAL)	An online system by Department for Transport and National Highways for notifying authorities of planned abnormal load movements on Great Britain's road network.
Embedded design (primary) mitigation	Modifications to the location or design of the Project which are a result of design evolution. Modifications which are an inherent part of the Project design for the purpose of avoiding, preventing or reducing likely significant environmental effects. For example, reducing the height of a development to reduce visual impacts or inclusion of areas of habitat planting in the design to mitigate ecological impacts.
Enhancement	Measures taken to achieve a net benefit, which are unrelated to an adverse impact, or which go beyond that required to mitigate for an impact. For example, restoration of a degraded habitat to leave it in a measurably better state than it was before the Project, or other interventions to leave a positive legacy for the environment and community.
Environment Agency	Regulatory Agency in England responsible for licences and consents relevant to flooding, discharge consents, waste licences and the protection of the environment
Environment (Health)	Environment includes health. The two are inextricably linked as one system. EU Directive 2014/52/EU Article 3 on EIA is explicit that human health is a factor within the definition of environment. Similarly, EU Directive 2001/42/EC Annex 1 and the Protocol on SEA Article 2 are explicit that environment includes health projects (IEMA, 2022a).
Environmental Impact Assessment (EIA)	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making.
Environmental Statement	A document that describes the results of an Environmental Impact Assessment and its effects on the environment.

Term	Definition
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.
Global warming potential	Global warming potential is used to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emission of 1 tonne of a gas will absorb over a given period of time, relative to the emission of 1 tonne of carbon dioxide. The larger the global warming potential, the more that a given gas warms the Earth compared to carbon dioxide over that time period. The time period usually used for GWPs is 100 years.
Greenhouse gases	Greenhouse gases refer to gaseous compounds that absorb infrared radiation and trap heat in the atmosphere and include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).
Habitats Regulations Assessment (HRA)	A Habitats Regulations Assessment refers to the several distinct stages of assessment which must be undertaken in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended) if a plan or project may affect the protected features of a habitats site, before a decision can be made on whether to authorise it.
Hazardous waste	Waste which displays one or more of the hazardous properties listed in Annex III of the Waste Framework Directive.
Health and human health	A state of complete physical, mental and social wellbeing and not merely the absence of disease of infirmity. The definition of ‘health’ has not changed since 1946, and it is clear that mental and social wellbeing are also to be considered in addition to effects on physical health. Health and wellbeing are influenced by a range of factors, termed the ‘wider determinants of health.’ The terms ‘health’ and ‘health and wellbeing’ are used interchangeably (IEMA, 2022a).
Heavy Goods Vehicles (HGV)	Vehicles with a gross weight of more than 3.5 tonnes.
Heritage Asset	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing).
Historic Environment Record	Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use. For the TDRA Project this is operated by the GLHER part of Historic England.

Term	Definition
Invasive Non-Native Species (INNS)	Species that have been released either deliberately or accidentally outside of their natural range, where they have become established and cause adverse ecological, environmental, or economic impacts.
Landscape/Townscape Character Areas	‘These are single unique areas which are the discrete geographical areas of a particular landscape [townscape] type.’ (GLVIA3)
Landscape/Townscape Character Types	‘These are distinct types of landscape [townscape] that are relatively homogenous in character.’ (GLVIA3)
Level of Protection	The degree of safety measures implemented to protect workers and the environment during remediation activities, often categorised based on the potential hazards present.
Locally Listed Building or BTM	A locally designated heritage asset (also known as a 'Building of Townscape Merit' in LBR) is a building or structure which is not statutorily listed, but is recognised for its significance to the history and character of the local environment.
Local Nature Reserve (LNR)	A site that is designated by the local authority under section 21 of the National Parks and Access to the Countryside Act 1949 for nature conservation, which has wildlife or geological features that are of special interest locally.
London Lorry Control Scheme (LLCS)	The mechanism used to control the movement of heavy goods vehicles above a maximum gross weight of 18 tonnes.
Materials	Substances and objects which will be used during any lifecycle stage of a development. Physical resources that are used across the lifecycle of a development, typically expected to be in solid form.
Mental health	A ‘state in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community’. This definition clarifies the ‘mental wellbeing’ element within the WHO health definition (IEMA, 2022a).
National Nature Reserves (NNR)	Land declared under the National Parks and Access to the Countryside Act 1949 or Wildlife and Countryside Act (1981).
National Policy Statement for Water Resources Infrastructure	A policy statement for nationally significant projects which provides a clear framework for the consideration of development consent applications for water infrastructure.
Net zero carbon	Net zero carbon emissions describes circumstances where the amount of carbon dioxide and other greenhouse gases emitted by human activity is equal to the amount removed from the atmosphere.

Term	Definition
National Policy Statement (NPS	A national policy statement is a formal document outlining a government's policy for a specific area of national significance, like infrastructure development. It provides a framework for decisions regarding applications for development consent for projects falling within its scope.
Offsetting	Measures used to make up for unavoidable negative impacts on the environment. These offsets aim to achieve a 'no net loss' or even a 'net environmental gain' by implementing positive actions to ensure positive outcomes to the environment. This may be located outside of the Project site. Offsets can include activities like habitat restoration, creation of new habitats, or other conservation actions.
Planning Inspectorate (PINS)	The Planning Inspectorate (PINS) is an executive agency of the UK government that deals with planning appeals, national infrastructure planning applications, and examinations of local plans in England, according to GOV.UK[6]. They act on behalf of the Secretary of State, making decisions and recommendations on a range of planning-related matters, including everything from small household extensions to large infrastructure projects.
Planning Act 2008	Act of Parliament which, amongst other things, establishes the regime for the consenting of infrastructure[7] projects (nationally significant infrastructure projects[8] (NSIPs)) and introduces National Policy Statements[9] (NPSs).
Population	Any group of people with shared characteristics. This could be the entire population of a defined area, or a population defined by relevant characteristics that make them more vulnerable to a proposal change, such as age or socioeconomic status (IEMA, 2022a).
Population health	This means the health outcomes of a group of individuals, including the distribution of such outcomes within the group (IEMA, 2022a).
Preliminary Environmental Information	Initial environmental data and assessments provided early in the Development Consent Order process to inform decision making.
Protected and notable species	Species of plant and animal protected by legislation, and species of conservation importance such as priority species.

[6] https://www.gov.uk/government/organisations/planning-inspectorate
[7] https://www.lexisnexis.co.uk/legal/glossary/infrastructure
[8] https://www.lexisnexis.co.uk/legal/glossary/nationally-significant-infrastructure-projects-
[9] https://www.lexisnexis.co.uk/legal/glossary/policy

Term	Definition
Public health	This is a theoretical and practical discipline in its own right and is the science and art that focuses on: population health, human systems and interventions intended to improve population health, and interactions between these two systems (IEMA, 2022a).
Public Rights of Way (PRoW)	Routes that the public have the legal right to pass and re-pass. This includes footpaths (for pedestrian use), bridleways (for pedestrian, cyclist and horse-rider use), restricted byways (any transport without a motor), and byways open to all traffic (any kind of transport, including cars).
Recycled water	Final effluent that has been treated through enhanced treatment processes to remove further impurities to create recycled water.
Recycling	Any recovery operation where waste is reprocessed into products, materials or substances whether for its original or other purposes. Recycling includes the reprocessing of organic material, but excludes energy recovery and the reprocessing of waste into materials to be used as fuels or for backfilling operations.
Reduction	Where avoidance is not possible, then mitigation is used to lessen the magnitude of impact or significance of effects.
Remediation	The process of removing, treating, or containing contamination from soil, groundwater, or surface water to reduce risks to human health and the environment.
Reuse	Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.
Sewage treatment works	A facility designed to treat wastewater to remove contaminants before it is released back into the environment.
Significance	This relies on informed, expert judgement about what is important, desirable or acceptable for public health with regard to changes triggered by the proposal in question. The use of ‘significance’ in this guide is distinct from ‘statistical significance’. Statistical significance is routinely used in scientific analysis to refer to whether the effects are real rather than chance occurrences, and is not necessarily a test of importance, desirability or acceptability (IEMA, 2022a).
Site of Importance for Nature Conservation (SINC)	In London, Local Wildlife Sites (LWS) (see the LWS entry above) are known as Sites of Importance for Nature Conservation (SINCs).

Term	Definition
Site of Special Scientific Interest (SSSI)	A site designated as being of special interest for its flora, fauna or geological or physiographical features and protected under the Wildlife and Countryside Act 1981
Special Areas of Conservation (SAC)	An area within the UK which has been identified as being important for a range of vulnerable habitats, plant and animal species within Europe and is designated under the Conservation of Habitats and Species Regulations 2017.
Special Protection Area (SPA)	Sites within the UK designated under the Conservation of Habitats and Species Regulations 2017 due to their international importance for the breeding, feeding, wintering or migration of rare and vulnerable species of birds.
Special Sites	Areas designated under Part 2A of the Environmental Protection Act 1990 due to their complex contamination or significant environmental impact. These sites require specialised management and oversight.
Stakeholders	People or organisations from public, private and/or voluntary sectors and the communities or groups involved in, or affected by, a project (IEMA, 2022a).
Standard good practice (tertiary) mitigation	Standard good practice measures or actions to reduce impacts, regardless of the design process and EIA assessment. These include actions that will be undertaken to meet existing legislative requirements, and/or actions that are considered to be standard good practice used to manage commonly occurring environmental effects during the construction and operational phases. For example, root protection zones when working near trees and considerate contractors' practices that manage activities which have potential nuisance and environmental effects, such as the spillage of fuels, oils or other chemicals.
Strategic Road Network (SRN)	Motorways and major A-roads that are managed by National Highways.
Tertiary treatment plant	A water treatment facility that further purifies water following primary and secondary treatment stages.
Townscape	'The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.' (GLVIA3)
Transport for London Road Network (TLRN)	The road network in London which is managed and maintained by Transport for London.
Tree Preservation Order (TPO)	An order made by local planning authorities in England to protect specific trees, groups of trees or woodlands in the interests of amenity.

Term	Definition
Tunnel boring machine (TBM)	A machine used to excavate tunnels through rock and soil.
UK Eutrophying and Acidifying Atmospheric Pollutants	A category of pollutants that contribute to nutrient enrichment and acidification of ecosystems.
Waste	Any substance or object which the holder disposes of or is required to dispose of pursuant to the provisions of national law in force.
Waste hierarchy	The rank of waste management options according to what is best for the environment, as set out in Regulation 12 of the Waste (England and Wales) Regulations 2011. It gives top priority to waste prevention in the first place. When waste is created, it gives priority to preparing it for reuse, then recycling, then recovery (including energy recovery), and last of all disposal (e.g. landfill).
Wastewater	Wastewater is defined as ‘a combination of one or more of: domestic effluent consisting of blackwater (excreta, urine and faecal sludge) and greywater (kitchen and bathing wastewater); water from commercial establishments and institutions, including hospitals; industrial effluent, stormwater and other urban runoff; agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter’ (Corcoran et al. 2010)
Water Framework Directive (WFD)	The Water Framework Directive (2000/60/EC) is an EU directive which was transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (‘the WFD Regulations’).) and prevent any deterioration to these waterbodies. It has introduced a comprehensive River Basin Management Plan system to protect and improve the ecological quality of the water environment. It is underpinned by published environmental standards.
Water Resource Management Plan (WRMP)	Regulatory requirement that sets out how water companies intend to achieve a secure supply of water for their customers and protect and enhance the environment.
1 in 200-year drought	A 1 in 200-year drought, in the context of water resource planning, refers to a drought event with a historical return period of approximately 200 years. This means that such a drought event, defined by specific criteria like duration, severity, and geographic spread, is expected to occur, on average, once every 200 years.

8. Acronyms

Acronym	Term
AIL	Abnormal Indivisible Loads
CEMP	Construction Environmental Management Plan
CoCP	Code of Construction Practice
DCO	Development Consent Order
Defra	Department of Environment, Food and Rural Affairs
EIA	Environmental Impact Assessment
ES	Environmental Statement
GHG	Greenhouse Gas
GLHER	Greater London Historic Environment Record
GWP	Global Warming Potential
HGV	Heavy Good Vehicle
HRA	Habitats Regulations Assessment
LNR	Local Nature Reserve
LTOA	Lower Thames Operating Agreement
MBBR	Moving Bed Biofilm Reactor
NNR	National Nature Reserve
NTS	Non-Technical Summary
PEIR	Preliminary Environmental Information Report
RAPID	Regulators' Appliance for Progressing Infrastructure
SAC	Special Area of Conservation
SINC	Site of Importance for Nature Conservation
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
TBM	Tunnel Boring Machine
TDRA	Teddington Direct River Abstraction
TLT	Thames Lee Tunnel
TTP	Tertiary Treatment Plan
WRMP	Water Resources Management Plan