Section 48
Pre-application publicity report

Summer 2012
Section 48: Pre-application publicity report
Thames Tideway Tunnel

Section 48: Pre-application publicity report

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1 Introduction

1.1 Purpose of this report

1.1.1 Thames Water is developing plans to build and operate the Thames Tideway Tunnel in order to provide much-needed sewage infrastructure for London. Following our analysis of and response to phase two consultation, and the targeted consultations we have undertaken at selected sites, we are now ready to publicise our proposed application for development consent for the project.

1.1.2 This is a formal process that we are required to undertake in accordance with Section 48 of the Planning Act 2008 (the ‘2008 Act’). The purpose is to publicise our intention to make a development consent order (DCO) application for the project. Accordingly, this stage is different from the principal phases of consultation that we have undertaken, but we are still interested to know whether people have any views on the published material. These views will be taken into account before we finalise our proposed application, which is likely to be in early 2013.

1.1.3 This report provides an overview and summary of the documents, plans and maps we are publicising and sets out where to find the full information and how to respond to it. It also explains those matters which we propose to include in our proposed application and outlines the next steps in the process.

1.1.4 The project has been designated as a Nationally Significant Infrastructure Project (NSIP) under the 2008 Act; therefore the necessary powers to build and operate it will be sought via a development consent order (DCO) application. We have developed our ideas and designs over a number of years in full consultation with our stakeholders and the community. A summary of our pre-application consultations is provided at Appendix A.

1.1.5 The remainder of this report covers the following matters:

a. Section 2 contains a description of the project

b. Section 3 describes the documents, plans and maps that explain the nature and location of the proposed development and where the information is available for viewing

c. Section 4 summarises the legal basis for the proposed application and the powers that we intend to include within the DCO

d. Section 5 provides an overview of the next steps for the project.
2 Project description

2.1 Background

2.1.1 At present untreated sewage mixed with wastewater (combined sewage) regularly overflows into the River Thames from London’s Victorian sewerage system via combined sewer overflows (CSOs). The proposed Thames Tideway Tunnel project would intercept these discharges through the use of a new storage and transfer tunnel, which would link Acton Storm Tanks in west London to Abbey Mills Pumping Station. The sewage flows would then be transferred to Beckton Sewage Treatment Works via the Lee Tunnel.

2.1.2 Discharges must be reduced in order to comply with relevant wastewater legislation. The UK Government is obliged to meet the requirements of the Urban Waste Water Treatment Directive and the Water Framework Directive. Thames Water must also meet the requirements of the related UK Urban Waste Water Treatment Regulations 1994 in respect of collecting and treating sewage within its area and, in exercising its functions, Thames Water must have regard to the relevant river basin management plan prepared under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003.

2.1.3 Solutions to the problem of wastewater discharges into the Thames Tideway (the tidal reaches of the River Thames) have been under examination for more than ten years. The project has been determined to be the most technologically sound and cost-effective means of controlling discharges and satisfying regulatory requirements. This has been confirmed by independent studies and by Thames Water.

2.1.4 The National Policy Statement for Waste Water, designated on 26 March 2012, clearly states that the need for the project has been demonstrated. It concludes that “detailed investigations have confirmed the case for a Thames Tunnel as the preferred solution” (paragraph 2.6.33). The decision maker will judge the proposed DCO application for the project primarily on the policies in this National Policy Statement.

2.1.5 In summer 2012, the project was designated a Nationally Significant Infrastructure Project (NSIP) and is therefore subject to the provisions of the 2008 Act.

2.2 The proposed solution

2.2.1 A full project description is provided in the Section 48: Project description and environmental information report. Figure 2.1 shows the tunnel alignment, drive direction, site types and locations. A summary project description follows.
Figure 2.1 Proposed Thames Tidway Tunnel route and sites
2.2.2 The project comprises a wastewater storage and transfer tunnel (the ‘main tunnel’) between the operational Thames Water sites at Acton Storm Tanks and Abbey Mills Pumping Station. This would capture combined sewage flows from 34 combined sewer overflows identified as unsatisfactory by the Environment Agency.

2.2.3 The project comprises two main elements:

a. tunnels:
   i. the main tunnel
   ii. connection tunnels.

b. sites:
   i. main tunnel sites
   ii. combined sewer overflow sites
   iii. Beckton Sewage Treatment Works
   iv. system modification sites.

**Main tunnel**

2.2.4 The horizontal alignment of the main tunnel would generally follow the River Thames where possible and practical in order to:

a. ensure the most efficient route to connect the combined sewer overflows located on both banks of the river

b. allow the use of the river for construction transport (supply and removal of material), where practicable and economic

c. minimise the number of structures the tunnel would pass beneath and thereby reduce the number of third parties affected.

2.2.5 The route of the main tunnel would run from Acton Storm Tanks to the River Thames and remain underneath the river from west London to Rotherhithe. It would then divert from beneath the River Thames to the northeast via the Limehouse Cut and terminate at Abbey Mills Pumping Station, where it would connect to the Lee Tunnel. The captured combined sewage would then be transferred to Beckton Sewage Treatment Works via the Lee Tunnel.

2.2.6 A fuller description of the route of the main tunnel and the principles that guide the tunnel alignment is provided at Appendix B. The proposed route, including sites and drive strategy, is illustrated above at Figure 2.1.

2.2.7 The main tunnel would be approximately 25km long with an internal diameter of 6.5m in the west increasing to 7.2m through central and east London. The approximate depth of the tunnel would be between 30m in west London and 65m in the east in order to provide sufficient clearance to existing tunnels and facilities under the capital.

**Main tunnel sites**

2.2.8 Main tunnel sites would be used for the construction and operation of the main tunnel. Shafts would be constructed down to the appropriate depth and tunnel boring machines would be used to construct the main tunnel.
The tunnel boring machines would enter via drive shafts and be removed at reception shafts.

### Connection tunnels

2.2.9 Two long connection tunnels would be required in order to connect five remote intercepted combined sewer overflows to the main tunnel. The tunnels are known as the Frogmore connection tunnel (approximately 2.6m in internal diameter and approximately 1.1km long) situated in the London Borough of Wandsworth, and the Greenwich connection tunnel (approximately 5m in internal diameter and approximately 4.6km long), which would pass through the London boroughs of Southwark and Lewisham and the Royal Borough of Greenwich.

2.2.10 A series of short connection tunnels would also be required to connect combined sewer overflows to the main tunnel.

### Combined sewer overflow sites

2.2.11 Combined sewer overflow sites would be used for works to intercept and control existing combined sewer overflows and connect them to the main tunnel. Each site would temporarily accommodate the construction equipment and activities required to create the interception and control facilities. They would also house the permanent structures required for the operation, ventilation and maintenance of the combined sewer overflows, which would include:

a. ventilation structures, air extraction fans, odour treatment facilities, and ventilation columns

b. a means of access and space adjacent to the interception location and drop structures for periodic inspection and maintenance

c. a kiosk structure to house control equipment.

2.2.12 All construction sites would be restored on completion of the works by means of levelling, in-filling and landscaping.

### Beckton Sewage Treatment Works

2.2.13 Upgrades at Beckton Sewage Treatment Works would also be required to enable it to cater for the additional volume of combined sewage flows over and above those from the Lee Tunnel.

2.2.14 The overflow from the Lee Tunnel, which was constructed as part of the Lee Tunnel project, would be re-configured. This would require the construction of two shafts and a connection tunnel as well as the installation of two additional pumps, associated culverts, pipelines and tunnels.

### System modifications

2.2.15 Other works would also be required in order to integrate the project into the existing sewerage system. This would include small scale in-sewer modification works, routine inspections of sewers, and minor street works that would be undertaken at or in the vicinity of existing Thames Water combined sewer overflow sites and associated infrastructure. These other
works would be subject to the usual notification procedures for affected streets and would be of limited duration.

2.3 Benefits of the proposed solution

2.3.1 By reducing the volume of untreated sewage that enters the River Thames, the project would bring long-term benefits to London’s water frontage and users of the river. Improved river water quality would also have major benefits for a range of environmental assets such as fish nurseries, sites designated for wildlife, and a number of sensitive habitats of conservation importance.

2.3.2 In terms of wider economic and social benefits, the project would:

a. remove a constraint on London’s future housing and employment growth, with consequent benefits for the national economy
b. create new skills and jobs related to the construction and operation of the main tunnel
c. create a long-term legacy of new publicly-accessible spaces in highly congested areas of London’s riverside
d. invest in new buildings, structures and public realm and regenerate brownfield land
e. avoid damage to London’s reputation as a business and tourism centre, especially since competitor locations are undertaking similar wastewater investments
f. avoid long-term adverse impacts on the desirability and value of riverside property.
3 Section 48 publicity materials

3.1 Content of publicity materials

3.1.1 The following additional documents and plans are available as part of our Section 48 publicity materials.

Table 3.1 Section 48 publicity documents and plans

<table>
<thead>
<tr>
<th>Document</th>
<th>Content and purpose</th>
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<tbody>
<tr>
<td><strong>Section 48: Proposed schedule of works</strong></td>
<td>The <em>Section 48: Proposed schedule of works</em> contains a description of the proposed development for which we intend to seek development consent. When we submit our DCO application, the description of the proposed development will be contained in a schedule to the draft DCO.</td>
</tr>
</tbody>
</table>
| **Section 48: Book of plans** | The *Section 48: Book of plans* contains the following plans for each site:  
  a. **Works plans and sections**, which identify the Order limits incorporating the tunnels’ Limits of Deviation and the Limits of Land to be acquired or used. The plans show the proposed tunnel route and our proposed construction sites. The sections show the vertical level of the tunnel in comparison to the ground surface  
  b. **Land acquisition plans**, which identify the land that we intend to acquire, both temporarily and permanently. The plans show that a significant portion of the land to be acquired is Subsoil only for the tunnels  
  c. **Project plans**, including:  
    i. **Location plan**, which illustrates the location of the proposed works in the context of the surrounding area  
    ii. **Existing site features plan**, which identifies the existing site features  
    iii. **Access plan**, which identifies any new access routes, stopping up of streets or roads, extinguishments or creation of rights of way or public rights of navigation  
    iv. **Demolition and site clearance plan**, which identifies buildings and other structures/facilities and trees to be removed  
    v. **Site works parameter plan**, which identifies zones within which the |
## Document Content and purpose

<table>
<thead>
<tr>
<th>Document</th>
<th>Content and purpose</th>
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<tbody>
<tr>
<td>permanent works would be located vi</td>
<td><strong>Site works parameter key plan</strong>, which shows the location and relationship of the sites to each other</td>
</tr>
<tr>
<td>vi</td>
<td><strong>Permanent works layout</strong>, which shows a layout and footprint of the proposed permanent works. This plan is illustrative in all instances given the flexibility prescribed by the parameter plans detailed above</td>
</tr>
<tr>
<td>vii</td>
<td><strong>Proposed landscape plan</strong>, which shows the proposed landscaping works for the site</td>
</tr>
<tr>
<td>viii</td>
<td><strong>Section</strong>, showing below-ground structures in context of the above-ground structures.</td>
</tr>
<tr>
<td>ix</td>
<td><strong>Elevation</strong>, showing the proposed above-ground works in the context of their surroundings.</td>
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</table>

Any discrepancy between the location of structures and the parameters marked on the drawings is due to differences between the Ordnance Survey base and the topographic survey base, both of which were used in the preparation of the drawings.

### Section 48: Transport strategy

The **Section 48: Transport strategy** summarises how we propose to service our sites by road and river.

### Code of construction practice Part A: General requirements (Summer 2012 draft)

The **Code of construction practice Part A: General requirements** sets out a series of objectives and measures that will be applied throughout the construction period to manage the impacts of construction.

### Section 48: Project description and environmental information report

The **Section 48: Project description and environmental information report** will describe the nature and location of the proposed development and set out findings from the Environmental Impact Assessment (EIA).

### 3.1.2

The documents, plans and maps showing the nature and location of the proposed development are available for inspection from 16 July to 5 October 2012 at the locations specified in Appendix C during published opening hours. The material is also available on the project consultation website, see below.

### 3.1.3

A CD or hard copies of these documents, plans and maps are available on request and copies can be made available in large print, Braille or audio format. To request copies of the documents, please contact us using the details specified below. A telephone translation service is also available. Please contact us on **0800 0721 086**.
3.1.4 The purpose of these materials is to publicise our intention to make an application for the project. This is not an additional consultation stage but we are still interested to know whether our stakeholders have any views on the published material.

3.1.5 All responses to the publicity of the proposed application must be submitted by 5pm on 5 October 2012. Only written responses can be accepted. They should be submitted as follows:

- By post to: Thames Tunnel, Thames Water, Freepost SCE 9923, PO Box 522, Swindon SN2 8LA
- By email to thames.tunnel@thameswater.co.uk
- Online via the project website: www.thamestunnelconsultation.co.uk.

3.1.6 These views will be taken into account before the proposed application is finalised.

3.2 Project website

3.2.1 A range of useful background material is available online on the project website (www.thamestunnelconsultation.co.uk), including all of our previous consultation material and:

a. **project information papers**, which provide general project-wide information in relation to the project, including our Preliminary environmental information report

b. **site information papers**, which provide general information in relation to each individual site along the route of the project

c. **supporting technical reports**, including our Section 48: Report on site selection process, which explains our approach to identifying the sites required to construct and operate the project. It also describes each stage of the site selection methodology, how the methodology was implemented, and the results of the process.

d. **targeted consultation material**.

3.2.2 Copies of this material can be made available on request.
4 Components of the proposed application

4.1 Development consent order application

4.1.1 The following powers are to be sought in the DCO application:

a. Planning authorisation for the main tunnel, including associated development that does not fall within the definition of the NSIP but which is needed in order to construct, operate and maintain the project. The planning authorisation will include Listed Building Consent and Conservation Area Consent, where appropriate, in order to authorise works to various heritage features. This authorisation will be subject to the requirements set out in the DCO. These requirements will be similar to planning conditions and regulate and control the manner in which the project would be constructed and operated. The DCO will also seek power to carry out works to streets and stop up and divert streets temporarily, and in one instance permanently, including the diversion of statutory undertakers’ apparatus and the amendment or imposition of traffic management measures.

b. The power to extinguish and temporarily stop up and divert public rights of way.

c. Various powers in relation to the acquisition, use and maintenance of land, including the compulsory acquisition of land and rights over land needed for the construction, operation and maintenance of the project. In the case of land needed for tunnels only, the necessary subsoil will be acquired. In other cases, both land at the surface and subsoil will be acquired. The DCO will also seek power to allow land to be used temporarily for the construction and maintenance of the project (as opposed to permanently acquiring it for that purpose).

d. Power to undertake survey works as well as protective and, if necessary, remedial work to buildings and structures.

e. Provision is made for the payment of compensation for the land and rights acquired for the permanent and temporary use of land as well as in respect of the surveying of land and protective or remedial works to buildings.

f. The DCO is intended to include a licence for the necessary works below the mean high water mark, which would otherwise have to be approved by the Marine Management Organisation.

g. The DCO will also seek power to apply, modify or exclude existing statutory provisions including provisions of local application.

4.1.2 The Secretary of State has issued a safeguarding direction in relation to the critical drive sites of Carnwath Road Riverside and Kirtling Street. The effect of this direction is that the local authorities concerned cannot grant planning permission for any alternative development without specific authorisation from the Secretary of State for Communities and Local
Government – that is, the sites are safeguarded for the Thames Tideway Tunnel project.

4.2 The level of detail shown for sites included in the DCO

4.2.1 The works we are seeking approval for will be shown on a series of plans for each site, contained in the Section 48: Book of plans, which will be submitted with our DCO application. The level of detail provided on the plans will vary across each of the sites.

4.2.2 For each site we will define parameters for zones within which the works will be carried out. We will also indicate limits of deviation within which the tunnel will be built. This is to allow a degree of flexibility in order to enable:

a. the contractor to use a selected methodology, plant and equipment, based on the contractor’s experience and expertise, in order to construct the works as efficiently and safely as possible

b. development of works designs and methodologies based on further design development, more detailed site and geological information available at the time of construction or in response to unforeseen circumstances

c. sites to be arranged to respond to surrounding land uses at the time of construction in order to minimise disruption and nuisance

d. alternative procurement and contract packaging arrangements, which may for example amend the currently planned construction phasing and duration.

4.2.3 At the majority of sites, the layout of the permanent works and landscaping shown on the plans is indicative or illustrative. Final design layouts will be subject to further approval closer to implementation of the relevant part of the project. This will allow designs to evolve to reflect the latest stakeholder requirements. We expect that the requirements imposed on the DCO will require details to be submitted for approval to be in accordance with the relevant works plan, site works parameter plan, and design principles which will be submitted with our DCO application.

4.2.4 At less sensitive sites or where the degree of agreement with stakeholders on design is less established, or where the future use of a site and the surrounding developments is less certain, the degree of flexibility in final appearance is greater. We will present illustrative material for these sites.

4.2.5 A greater level of detail will be provided for foreshore sites, sites in close proximity to listed buildings and structures, and sites within heritage or other visually sensitive areas as the location and nature of these sites are more sensitive. This detail will be indicative.

4.2.6 The following categories are used to indicate the level of detail shown on the plans for each of the construction sites:
a. ‘For approval’: the detail included on the plan has been submitted for approval. The development would be carried out in accordance with the details shown on the plan.

b. ‘Indicative’: the detail shown on the plan is not for approval. The plan indicates and commits to the way in which the development would be arranged. However, details such as materials, planting schedules etc remain to be determined. The final detail of the works will be submitted and approved under the requirements for the site in the DCO and must be in accordance with the indicative layout and the design principles that will be included in the DCO application.

c. ‘Illustrative’: the detail shown on the plan is not for approval. The plan illustrates one way in which the development or an element of it might be arranged in accordance with design principles that will be developed for the site in question, but it is not a commitment to arrange the development as illustrated. The final layout of the development, or the relevant part thereof, will be submitted for approval under the requirements for the site in the DCO application. These details may differ from the illustrative layout in the application. The layout submitted for approval under the requirement must, however, be in accordance with the works plan, site works parameter plan, and design principles for that site.

d. The Section 48: Book of plans also contains plans marked ‘For information’. These plans show existing details on sites (for example the existing site features and layout). They are not for approval as part of the DCO application but are provided to inform consideration of our proposed application.
5 Next Steps

5.1.1 The publicity for our proposed application will start on 16 July 2012 and will close at 5pm on 5 October 2012.

5.1.2 We will take account of all the responses to our publicity in finalising our proposed DCO application. Our response to comments received will be set out in the formal Consultation report that we are legally required to provide as part of our proposed application. We will also finalise all the documentation needed to support the DCO application. We intend that this will include:

a. the Environmental Statement
b. the proposed Development consent order
c. an Explanatory memorandum explaining the purpose and effect of provisions in the draft order
d. works plans for the project that show the route of the tunnel including the horizontal limits of deviation within which it might be constructed and the location of our construction sites and shafts
e. land plans and the Book of reference for the project, which respectively show and list the land included within the order limits, including land owned by the Crown
f. access plans showing how access to the project will be provided and any areas of highway or Public Rights of Way that would need to be diverted or stopped up to enable the project to be constructed
g. a Flood risk assessment
h. a statement as to whether the project might give rise to any statutory nuisance and, if so, how that might be mitigated
i. a report and assessment of the effects of the project on any designated site of European importance to wildlife
j. a statement of reasons for the compulsory acquisition of land or rights over land within the order and a statement to indicate how we propose to fund the order
k. plans and information identifying effects on any statutory or non-statutory sites or features of nature conservation importance, habitats of protected species, important habitats or other diversity features and water bodies in a river basin management plan
l. plans and information identifying effects on any statutory or non-statutory sites or features of the historic environment, including scheduled monuments, World Heritage Sites, listed buildings, other historic structures and archaeological sites
m. a Planning statement that assesses compliance with the National Policy Statement for Waste Water and the project’s relationship to other relevant policy
n. a Design and access statement describing the design context and evolution of the project

o. Landscape and architectural design principles

p. other plans, drawings, sections and documents necessary to describe the project or to support the proposed application for development consent for the project.

5.1.3 The application for development consent for the project will be submitted to the Planning Inspectorate in early 2013. The Planning Inspectorate will decide within 28 days whether to accept the application, based on an assessment of a range of factors, including the adequacy of pre-application consultation and whether the application is of a satisfactory standard.

5.1.4 If the application is accepted, notice will be published. We will notify local planning authorities, prescribed organisations, stakeholders and landowners that the application has been accepted by the Planning Inspectorate. The Planning Inspectorate will invite relevant local planning authorities to submit a local impact report to provide details of the likely impact of proposed development on the authority’s area. Other stakeholders, landowners and members of the community will be given the opportunity to make representations to the Planning Inspectorate for or against the proposed application in response to the notice served by us. This will be made clear in the notices that we are required to serve.

5.1.5 The Secretary of State will appoint an ‘Examining Authority’ to examine the application. The Examining Authority will be a panel of five Examining Inspectors from the Planning Inspectorate. The Examining Authority will examine the key issues arising from our DCO application. In determining these issues, the Planning Inspectorate will consider the application submitted by Thames Water, the local impact reports submitted by local planning authorities, and the written representations submitted by other participants, and will generally ask questions in order to clarify points raised and to obtain further information. In some circumstances, hearings may be held at which Thames Water and other interested parties may speak.

5.1.6 Once the Examining Inspectors have considered all the evidence, they will prepare a report to the Secretary of State recommending whether or not to approve the DCO application, and the terms on which any approval should be granted. In the case of the Thames Tideway Tunnel project this report and recommendation will be considered and the decision to grant or refuse development consent will be taken jointly by the Secretaries of State at the Department for Communities and Local Government (DCLG) and the Department for Environment, Food, and Rural Affairs (Defra).

5.1.7 Subject to approval, our provisional start date for the main construction works is 2016.
A.1 Consultation activities

A.1.1 The 2008 Act requires us to undertake pre-application consultation on our proposals for the project and to take account of the responses we receive when formulating our proposals. We are committed to a genuine consultation process, as set out in our Statement of community consultation (SOCC) and Community consultation strategy (CCS). Before the project was formally designated as an NSIP, we carried out our consultation activities so as to comply with the requirements of the 2008 Act and the relevant regulations and guidance, had those requirements applied. Now that the project has been designated an NSIP, we are complying with the requirements of the 2008 Act and the relevant regulations and guidance.

A.1.2 We consulted extensively on our site selection methodology with potentially affected local authorities and other pan-London bodies through three rounds of consultation, which were undertaken in October 2008, April 2009 and summer 2011. We have also undertaken several rounds of consultation on our SOCC and CCS: the first from December 2009 to March 2010 and the second from May 2010 to June 2010.

A.1.3 Phase one consultation took place between September 2010 and January 2011. The responses to that consultation were analysed and considered and in our Report on phase one consultation (April 2011) we set out the feedback received and our response to the issues raised.

A.1.4 As a result of comments received during phase one consultation, further technical work, and design development, we undertook interim engagement on 11 sites between March and August 2011. The results of these consultations were reported in our Interim engagement report (September 2011).

A.1.5 Phase two consultation was undertaken between November 2011 and February 2012. The responses to that consultation were analysed and considered and reported in our Report on phase two consultation (May 2012).

A.1.6 In response to comments received during phase two consultation, we undertook targeted consultation in respect of specific issues and proposals at Barn Elms, Putney Embankment Foreshore, Albert Embankment Foreshore and Victoria Embankment Foreshore.

A.1.7 The feedback and comments received during all of our various consultation and engagement stages have been taken into account in the preparation of our proposed application that we are now publicising.

A.2 Changes since phase two consultation

A.2.1 The following table summarises the main changes that we made to our proposals at various sites in response to phase two consultation and/or as
a result of design development. The changes at these sites represent a reduction in effects and/or a general improvement to the design of the project. At these sites we do not consider that the degree of change or the effect on the local community would affect the nature of the comments received during phase two consultation. On that basis, we did not consider a further round of targeted consultation necessary. These sites will be included in our proposed application.

**Table A.1 Changes following phase two consultation**

<table>
<thead>
<tr>
<th>Site name</th>
<th>Changes</th>
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<tbody>
<tr>
<td>Acton Storm Tanks</td>
<td>We intend to replace the proposed ventilation building with two ventilation fan structures and filters that would be located in existing storm tanks 5 and 6, which will be used for this purpose and as the location of the drop shaft. We also intend to relocate the ventilation column to the area north of storm tanks 5 and 6 in order to minimise visual and townscape effects. We also intend to widen the footpath on the southern side of Canham Road and are considering options for additional landscaping.</td>
</tr>
<tr>
<td>Hammersmith Pumping Station</td>
<td>We intend to locate all above-ground structures (with the exception of minor structures) within the Hammersmith Pumping Station building or compound. We are continuing to consult with the developers of the Hammersmith Embankment/Fulham Reach site to ensure that our proposals are integrated with their proposals for this site. We are also proposing temporary offsite highway works on Distillery Road to facilitate the highway and junction improvements required for temporary construction access.</td>
</tr>
<tr>
<td>Dormay Street</td>
<td>We intend to relocate our permanent works in order to set them back from Bell Lane Creek by 4m in response to consultation comments. This is to ensure that our proposals do not prejudice the potential future development of a riverside walkway. We also intend to redesign the temporary bridge so as to remove the piles or supports in the creek to give the bridge a clear span. We are proposing temporary junction improvements at Armoury Way, Dormay Street and The Causeway to accommodate construction traffic.</td>
</tr>
<tr>
<td>King George’s Park</td>
<td>We intend to incorporate flood alleviation measures with the potential to create new pedestrian entrances to the north and east of the site, which would enable a reduction in the extent of hardstanding at the entrance to King George’s Park and replacement with new, soft landscaping. Additional landscaping measures, including advance planting, are also proposed. We propose to reuse the existing historic gates and railings within the park in response to consultation comments. We are also proposing temporary offsite highway works at Neville Close to facilitate the highway and junction improvements required for temporary construction access.</td>
</tr>
<tr>
<td>Carnwath Road Riverside</td>
<td>We intend to replace the proposed ventilation building with a smaller building to house air management plant and equipment and to relocate the permanent above-ground structures to the eastern side of</td>
</tr>
<tr>
<td>Site name</td>
<td>Changes</td>
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<td>---------------------------------</td>
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<tr>
<td>Whiffin Wharf</td>
<td>These structures could act as a buffer for any future housing on Whiffin Wharf from the operations of the safeguarded Hurlingham Wharf. We also intend to reduce the height of these buildings to 5.5m and to redesign and relocate the ventilation column to the eastern edge of Whiffin Wharf by the river. This would move the operational structures further away from existing housing. In the light of the proposed changes to the location of the above-ground structures, we propose to establish an area of landscaped open space in the western part of the site that would include a riverside walkway. We intend to revise our transport strategy to make further use of the river to import sand and aggregates for secondary tunnel lining in order to reduce the total number of lorries on local roads. We are now proposing higher hoardings around the perimeter of the site (up to 5m high), which would provide a 2.4m hoarding on the river wall to screen the barge-loading area and increase the acoustic screening of plant and equipment in order to reduce the effects of noise and dust. We also propose temporary offsite highway works at the junction of Wandsworth Bridge Road and Carnwath Road to facilitate the highway and junction improvements required for temporary construction access.</td>
</tr>
<tr>
<td>Cremorne Wharf Depot</td>
<td>We intend to revise our transport strategy to enable use of river transport to carry shaft and short connection tunnel excavated materials in order to reduce the total number of lorries on local roads. We propose to relocate the ventilation column closer to the river and away from the proposed residential units on the Lots Road Power Station site and the Grade II listed Lots Road Pumping Station. We also intend to amend the proposed replacement depot building design to set the structure back from the western elevation of the listed Lots Road Pumping Station in order to protect views of the building and its setting.</td>
</tr>
<tr>
<td>Chelsea Embankment Foreshore</td>
<td>We intend to revise the design of the proposed foreshore structure to incorporate ongoing design discussions with the Royal Borough of Kensington and Chelsea, including changes to the roundabout and</td>
</tr>
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### Appendices

<table>
<thead>
<tr>
<th>Site name</th>
<th>Changes</th>
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<tbody>
<tr>
<td>Kirtling Street</td>
<td>We have revised our transport strategy to make further use of the river to import sand and aggregates for secondary tunnel lining during construction while retaining the operations at the concrete batching works in order to reduce the total number of lorries on the road network.</td>
</tr>
<tr>
<td>Heathwall Pumping Station</td>
<td>We intend to revise our transport strategy to make further use of the river to transport shaft excavated materials in order to reduce the total number of lorries on the adjacent road network. We also intend to alter the construction barge mooring location to enlarge the cofferdam including moving the Battersea Barge further west for the duration of our construction works. We further intend to incorporate Sustainable Drainage Systems into our proposals and slightly increased the size of the permanent platform that would protrude into the river to accommodate an enlarged drop shaft and interception chamber. We have identified the need for an additional small tank breather unit (1m high by 0.5m dia column) to meet odour and ventilation requirements. The unit would be located within the Thames Water compound.</td>
</tr>
<tr>
<td>Blackfriars Bridge Foreshore</td>
<td>We intend to amend the design of our foreshore structure to introduce opportunities for play, additional planting and include a water feature and canopies for shade. We also intend to address navigational safety issues by reducing the extent of the encroachment of the permanent structure into the authorized channel and to revise the location of the relocated Blackfriars Millennium Pier. We intend to revise our transport strategy to make further use of the river to transport shaft and other excavated materials to reduce the total number of lorries on adjacent road network.</td>
</tr>
<tr>
<td>Shad Thames Pumping Station</td>
<td>We intend to reduce the height of the replacement building to the rear of the site and minimise the number of openings in that building in order to reduce visual bulk.</td>
</tr>
<tr>
<td>Chambers Wharf</td>
<td>We intend to amend the previously proposed raised ventilation structure to abut the river wall in order to minimise the effect on the future new public realm. We also intend to implement additional noise attenuation measures during construction. We intend to extend the boundary at Bevington Street to facilitate the offsite works required to provide a new pedestrian crossing near Riverside Primary School.</td>
</tr>
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### Site name | Changes
--- | ---
Earl Pumping Station | We intend to make some detailed changes to the layout and appearance of our proposals to improve the design and reduce impacts on the local community and the environment. We intend to amend the form of the proposed combined sewer overflow drop shaft to meet technical requirements and to change the built form of the above-ground part of the proposed shaft to provide an improved streetscape. We also intend to make minor boundary changes within Croft Street and Chilton Grove to reflect design modifications and carry out required utility diversions.
Deptford Church Street | We have identified an alternative fire assembly point for St Joseph's Catholic Primary School during construction. We intend to extend the site boundary to the west to provide for this fire assembly point and to extend it in the highway to facilitate highway works relating to site access and the relocation of a bus stop and pedestrian crossing. If our transport assessment concludes that the temporary closure of the northbound carriageways of Deptford Church Street (ie, putting north and southbound traffic onto the existing southbound lanes) would result in unacceptable impacts, we will consider options to maintain a single northbound carriageway through our proposed site for the period required to complete the works to intercept the sewer under the road. No changes would be required to either of the southbound carriageways. We also propose to use semi-mature trees in our landscaping in consultation with our stakeholders.
Greenwich Pumping Station | We intend to amend our proposals to avoid the need to demolish the listed Coal Shed structures. We also propose to extend the site boundary to include the pumping station building and to facilitate minor highway works.
King Edward Memorial Park Foreshore | We intend to locate construction site facilities off-site in order to reduce effects on the recreational facilities at the western end of the park and to introduce additional attenuation measures to address noise generated during construction. We intend to provide open-mesh fencing along the full extent of our proposed access route off Glamis Road to allow views through to the river and foreshore. We also intend to provide gated access to the proposed internal access road. This would be closed only when vehicles are accessing the site, which would be controlled by traffic marshals to ensure safe movements of traffic and pedestrians during construction. An alternative path to the north of the bowling green would remain open when the gates are closed. We intend to revise our transport strategy to make further use of the river to transport excavated material from the connection tunnels, interception and associated structures in order to help minimize the number of lorry movements. We also intend to improve the junction of Glamis Road and The Highway to facilitate safer access for vehicles. The site boundary...
<table>
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<tr>
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<tbody>
<tr>
<td>Bekesbourne Street</td>
<td>We intend to extend the site boundary into the highway in order to connect the two sites, facilitate design changes and carry out utility diversions. We also intend to relocate the control kiosk away from the land owned by the DLR to avoid conflict with an approved planning application in the vicinity. This change would result in a smaller site footprint. We have identified the need for a main ventilation column (4 to 8m high) to meet technical requirements. The column would be located at the rear of the footpath of Ratcliff Lane.</td>
</tr>
<tr>
<td>Abbey Mills Pumping Station</td>
<td>We intend to extend the site boundary to the public highway for access purposes. We also intend to extend the site boundary into the Prescott Channel to facilitate the potential use of river transport for excavated shaft materials and an associated pedestrian footpath diversion. We further intend to make some minor boundary changes to reflect design modifications.</td>
</tr>
<tr>
<td>Beckton Sewage Treatment Works</td>
<td>We intend to extend the site boundary to the public highway for access purposes.</td>
</tr>
<tr>
<td>Jews Row</td>
<td>Jews Row is no longer required as part of the Thames Tideway Tunnel project.</td>
</tr>
<tr>
<td>Main tunnel</td>
<td>We intend to move the limits of deviation of the main tunnel closer to the combined sewer overflow drop shafts in order to reduce the length of the connection tunnels that would be built in the Lambeth Group geological conditions. This applies to sections of the main tunnel around the following combined sewer overflow sites: Heathwall Pumping Station, Albert Embankment Foreshore and Victoria Embankment Foreshore. We also intend to widen the limits of deviation for the main tunnel at Victoria Embankment Foreshore and Blackfriars Bridge Foreshore to allow for the flexibility to adjust the location of the shaft.</td>
</tr>
<tr>
<td>Connection tunnels</td>
<td>We intend to widen the limits of deviation at the end of the connection tunnels where there is a junction with the main tunnel in order to optimize the location of the junction. Information to determine the optimum location might not be available until the main tunnel has been driven through the areas. This applies to the connection tunnels associated with the following sites: Hammersmith Pumping Station, Barn Elms, Putney Embankment Foreshore, Dormay Street, Falconbrook Pumping Station, Cremorne Wharf Depot, Chelsea Embankment Foreshore, Heathwall Pumping Station, Albert Embankment Foreshore and Victoria Embankment Foreshore.</td>
</tr>
<tr>
<td>Ventilation columns</td>
<td>At phase two consultation our proposed ventilation columns were 4 to 6m high. In general, we now intend these columns to be 4 to 8m high, in order to allow flexibility for future design development to create signature design features. At Carnwath Road Riverside and Acton Storm Tanks the columns are required to be 15m high to ensure...</td>
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<tr>
<td>Barn Elms</td>
<td>We intend to change the construction and operational access arrangements so that construction traffic would access the site from Upper Richmond Road (A205) and travel along Rocks Lane (A306) before turning right into Queen Elizabeth Walk. We also intend to reduce the scale and design of the permanent above-ground structures on this site.</td>
</tr>
<tr>
<td>Putney Embankment</td>
<td>We intend to modify the location and layout of the temporary works and our permanent design in response to comments received during phase two consultation on the permanent design of the works and the relationship to the public slipway. We also intend to change the nature and location of the temporary replacement slipway. These changes would require adjustments to the site boundary. We intend to revise our transport strategy to make further use of the river to transport excavated materials from the shaft and the short connection tunnel to the main tunnel away from the site in order to reduce the total number of lorries on local roads. A new construction traffic route via Glendarvon Street would be used to access the temporary slipway site.</td>
</tr>
<tr>
<td>Albert Embankment</td>
<td>At phase two consultation we proposed a construction access along Lack’s Dock, but this gave rise to security concerns from the occupants of Vauxhall Cross. We therefore undertook targeted consultation on an alternative construction access between Camelford House and Tintagel House, but this also raised objections from stakeholders. This combination of circumstances is exceptional and we therefore intend to include the two alternative access options in our DCO application. This will allow the issue to be considered and determined as part of the examination of the application. We also intend to make minor amendments to the design of the permanent works, including the shape of the foreshore structure, in order to address navigational safety issues and as a result of ongoing design development. We intend to revise our transport strategy to make further use of the river to transport excavated materials from the shaft and the short connection tunnel to the main tunnel away from the site in order to reduce the number of lorries on the adjacent road network.</td>
</tr>
<tr>
<td>Victoria Embankment</td>
<td>We intend to amend the layout and shape of our permanent design. The new proposed layout is more formal and symmetrical than that presented during phase two consultation and targeted consultation, and does not project as far into the river. It combines elements of the engineering design from targeted consultations with the architectural design presented at phase two consultations. We have reviewed the method of constructing the cofferdam and the</td>
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A.2.2 At the four sites at which we undertook targeted consultation, we intend to make the following changes:

Table A.2 Changes at targeted consultation sites

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</tr>
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<td>orientation of the moored barge to address navigational safety. We intend to revise our transport strategy to make further use of the river to transport excavated materials from the shaft and the short connection tunnel to the main tunnel away from the site in order to reduce the number of lorries on the adjacent road network.</td>
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Appendix B – Tunnel alignment

B.1 Principles guiding tunnel alignment

Health and safety

B.1.1 Under the Construction (Design and Management) Regulations 2007 (CDM), designers’ obligations are, insofar as reasonably practicable, to avoid foreseeable risks to the health and safety of any person carrying out construction work. The designer must eliminate hazards that may give rise to risks and reduce risks from any remaining hazards.

B.1.2 Tunnelling is one of the higher risk operations in the construction industry, therefore health and safety is a prime focus of the design, alongside system performance. The design process, including alignment selection, has been shaped by assessment of risk, which is formally recorded elsewhere under the CDM requirements. Some examples of specific risks that have influenced the tunnel alignment include:

a. the potential for deep foundations (the alignment avoids these areas where known or foreseeable)

b. the potential for scour holes or other poor ground in London Clay (limits of deviation have been increased to allow for future alignment flexibility)

c. the potential for very difficult ground conditions in the Lambeth Group (connection tunnels have been shortened as far as possible to allow ground treatment from the surface or in-tunnel ground freezing etc)

d. connection tunnels for deep shafts in chalk have been eliminated (except for the connection to the Lee Tunnel).

Shaft locations

B.1.3 Tunnel shaft locations were derived after an extensive exercise looking at the combined sewer overflow locations, suitability of available sites (which are of limited size and number in the urban environment), and tunnel drive strategies in accordance with the Site selection methodology paper.

Hydraulic controls

B.1.4 The objective of the project is to provide a cleaner River Thames, and the purpose of the tunnel is to store and convey sewage. It is fundamental to meet hydraulic requirements. In practice, the horizontal alignment is controlled by other factors such as minimum excavated radius, rather than hydraulics. However, hydraulics is the critical factor for vertical alignment and de-aeration has influenced connection tunnel lengths and diameters close to some shafts.

B.1.5 The depth of the main tunnel is dictated at its downstream end by the invert level at Shaft F at Abbey Mills (the Lee Tunnel Shaft), which is 40.184 m above tunnel datum (ATD). Tunnel datum is 100m below
Appendices

Ordnance Datum. Upstream from this, the tunnel depth is dictated by hydraulic constraints, mainly gradient, and existing buried infrastructure.

B.1.6 Hydraulics dictates the acceptable range of gradients for the tunnel. The tunnel needs to be self-cleansing with velocities during event cycles exceeding 1 m/s, which requires a gradient of at least 1 in 850. The target gradient for the main tunnel is 1 in 800.

B.1.7 A single gradient for the whole tunnel length is required to ensure well-conformed hydraulic behaviour. Changes in gradient are only permitted at online shaft locations. Tunnel gradients will be constant between online shafts and along connection tunnels.

B.1.8 The selection of gradient balanced the following interrelated issues:
   a. localised hydraulic requirements of the design
   b. depth of shafts
   c. acceptable clearances to third party infrastructure
   d. ground conditions, especially for the construction of shafts and tunnel junctions.

Tunnel connections

B.1.9 There are a variety of means by which combined sewer overflow drop shafts are connected to the main tunnel. At some locations, the drop shaft is remote to the main tunnel and the resulting connection tunnel junctions with the main tunnel directly in a concrete-lined underground chamber. In these locations the main tunnel alignment needs to be straight for a minimum of 5m either side of the connection centreline. This straight section of tunnel allows special straight lining sections to be built into the tunnel to facilitate construction of the junction sometime after the main tunnel has been excavated. One exception to this rule has been made for the Hammersmith connection tunnel, which joins the main tunnel on a 600m radius curve.

B.1.10 Hydraulically, an angle of 70° is required between the main tunnel and the connection tunnel to direct the flow from the connection tunnel downstream in the main tunnel. Angles less than 70° are not favoured from a structural design perspective because of the difficulties of safely constructing the large unsupported spans that result.

B.1.11 Vertically, connection tunnels join the main tunnel axis-to-axis to simplify construction.

B.1.12 Where connection tunnels join at a main tunnel shaft, the connection level is dictated by constraints along the alignment of the connection tunnel and its gradient.

Minimum radii

B.1.13 The main tunnel will have an excavated diameter of either approximately 8.1m for the drive between Acton Storm Tanks and Carnwath Road Riverside main shaft and approximately 8.8m for the remainder of the main tunnel to Abbey Mills Pumping Station. To construct the main tunnel, we propose to use a closed-face tunnel boring machine (TBM) using either
an Earth Pressure Balance machine in London Clay and Lambeth Group, or a slurry machine for excavation in Chalk. TBMs of this type have a long cylindrical shield immediately behind the cutterhead that dictates the minimum curve radius that can be excavated. The shield has to be long enough to accommodate the drive train, main bearing, slurry system or screw, shove rams, segment erector, tail seal etc. With this scale of tunnel, the preferred minimum horizontal radius is 600m. To negotiate this radius it is assumed that the TBM will be articulated. This minimum radius allows for the fact that tighter radii may be required to carry out alignment corrections during the drive to stay within the limits of deviation.

B.1.14 Radii down to about 400m are possible with special provisions but will inevitably increase cost, risk, and time. The potential to damage segments is increased. These special provisions may include:

a. It is possible to include a TBM articulation joints along the main shield.
b. A tail skin articulation joint is always fitted to allow alignment adjustment with the segments.
c. Back up trailers may need to be shortened to reduce the cord length on the curve behind the machine.
d. Rail and pipe lengths during the curve may need to be shortened.
e. The alignment/survey laser may need to be moved up more frequently.
f. The secondary lining shutter may need to be shortened to suit the tighter radius, and the construction programme may be increased as a result.

B.1.15 Therefore, 600m has been taken as the minimum radius for the main tunnel alignment.

B.1.16 The connection tunnels are smaller diameter (less than 5.5m) and will be excavated by a variety of methods depending on depth, geology, length, diameter, and third party constraints. The minimum horizontal radius to be negotiated by these smaller tunnels when excavated by TBM has been taken as 400m. Tighter radii are possible with open-face machines. Sprayed Concrete Lining (SCL) methods can be used to construct significantly smaller radii. However, closed-face TBM construction is preferred for the long main tunnel drives for programme, cost and constructability reasons. SCL has limitations depending on drive length, geology, depth, water ingress, etc.

Alignment through online shafts

B.1.17 When a TBM passes through an online shaft, the rings and shove frame do not have the lateral restraint normally offered by the surrounding ground. Therefore, in order to minimise lateral loads, a 15m long straight section of tunnel alignment has been introduced either side of an online shaft. This criterion also satisfies a hydraulic aim to minimise turbulence within the shafts.
B.1.18 In some locations it is necessary for the tunnel to change direction within a shaft. In these cases special arrangements would be provided by the contractor to accommodate thrust from the machine as it leaves the shaft. For hydraulic reasons the minimum desirable angle of incidence between the in-coming and out-going tunnels is 135°. However, exceptions are possible subject to appropriate hydraulic assessment. Two special arrangements, which have received hydraulic approval, were made to suit the third party infrastructure constraints:

a. at Kirtling Street the angle of incidence is 125°

b. at Abbey Mills Pumping Station the angle of incidence is 123°

Existing infrastructure

B.1.19 The tunnel alignment is constrained by the presence of existing infrastructure such as tunnels, bridges crossing the River Thames, buildings and foundations, utilities, and river walls. The tunnel alignment aims to minimise the risks associated with ground movements on third party infrastructure by maximising the separation between the tunnel and infrastructure, passing below the River Thames and other watercourses, as far as practical following roads or other open linear features.

B.1.20 Where possible, the alignment crosses close to the mid-point of the bridge spans, providing the maximum clearance to the bridge foundations to minimise the risk of settlement of the bridge piers. We have minimised the use of the first span, where services pass from being supported on the bridge deck and abutment onto the ground and are thus more susceptible to differential movement.

B.1.21 Where the tunnel passes beneath built-up areas, the alignment would avoid the larger building structures as these are likely to have piled foundations which will rely on ground reaction closer to the tunnelling depths.

B.1.22 The minimum clearance between the extrados of the tunnel and existing infrastructure is not less than 3m. The actual clearance is generally significantly greater than this, depending on geometrical constraints and the need to limit the impact of ground movements to acceptable levels.

B.1.23 An additional consideration has been as far as possible to select an alignment that facilitates the access from the surface for interventions to the tunnel face during tunnel construction, should this be necessary in an emergency.

B.2 Narrative description of the main tunnel alignment

Vertical alignment

B.2.1 The alignment has been split into two sections, each with a different gradient, separated by a vertical step in the main tunnel shaft at Carnwath Road Riverside. These sections are:

a. Acton Storm Tanks shaft to Carnwath Road Riverside shaft
Appendices

b. Carnwath Road Riverside shaft to Lee Tunnel Shaft F at Abbey Mills Pumping Station.

**Horizontal alignment**

**From Acton Storm Tanks to Hammersmith**

B.2.2 From the upstream end of the tunnel system in the west at the Acton Storm Tanks shaft, the main tunnel goes south through a developed urban area. The alignment runs under gardens or along roads where possible to avoid passing under buildings as far as possible. The tunnel also runs under and along the existing Acton Storm Water Outfall Sewer tunnel from Acton Storm Tanks to Netheravon Road.

B.2.3 The tunnel alignment crosses the above-ground District and Piccadilly line railway near Stamford Brook Station, then crosses Chiswick High Road, and continues down Netheravon Road.

B.2.4 As the tunnel crosses beneath the River Thames, it would pass above the Thames Water Ring Main and then pass under St Paul's School western playing fields before turning eastwards parallel to Lillian Road. It would continue eastward to the south side of St Paul's school eastern fields, passing south of the Hammersmith Bridge, underneath residential properties in Riverview Gardens, before passing back under the River Thames.

B.2.5 The Hammersmith connection tunnel would join the main tunnel approximately 250m east of the Hammersmith Bridge abutment, opposite the park in front of St Edmund’s Square. From here to Carnwath Road Riverside the main tunnel is entirely under the River Thames, with only one connection to the Putney Embankment Foreshore drop shaft. The tunnel would pass above the Thames Water Lee Valley Tunnel and beneath the Richmond to Fulham high pressure pipeline with an 8m vertical separation.

B.2.6 The approximate internal diameter of the main tunnel changes from 6.5m to the west to 7.2m towards the east at Carnwath Road Riverside. The Frogmore connection tunnel from the King George’s Park and Dormay Street CSO drop shafts are connected to the Carnwath Road Riverside main tunnel shaft.

**Carnwath Road Riverside to Kirtling Street**

B.2.7 From Carnwath Road Riverside the main tunnel follows the river to Kirtling Street. The alignment goes east and crosses under the proposed alignment of the Wimbledon to Kensal Green National Grid cable tunnel about 110m east of the Carnwath Road Riverside main tunnel shaft.

B.2.8 East of Carnwath Road Riverside, the main tunnel has to cross to the south side of the river and under an industrial estate including a PC World store to connect with the Falconbrook connection tunnel. The main tunnel passes through the north span of the Wandsworth Bridge.

B.2.9 After crossing beneath Wandsworth Bridge, the main tunnel would turn towards the eastern bank to shorten the length of the Falconbrook connection tunnel.
B.2.10 As the main tunnel heads north towards the connection with the Lots Road connection tunnel, it would pass below the second span (from the west) of the Battersea Rail Bridge before crossing back to the west bank of the river to connect to the Lots Road connection tunnel.

B.2.11 From the Lots Road connection tunnel, the main tunnel follows the Chelsea Reach of the Thames, passing under Battersea Bridge and Albert Bridge.

B.2.12 From the junction with the Ranelagh connection tunnel, the alignment would cross the mid span of Chelsea Bridge and the second span (from the south) of Grosvenor Bridge.

B.2.13 From Grosvenor Bridge, the main tunnel turns toward Kirtling Street on the south side of the River Thames. The main tunnel would pass beneath the jetty in front of the Cringle Dock refuse transfer station before reaching the Kirtling Street main tunnel shaft.

Kirtling Street to Blackfriars Bridge Foreshore

B.2.14 The main tunnel heads southeast, remaining north of the existing Tideway industrial units. The alignment here is designed to minimise the impact on known current and future developments that have planning permission. As the main tunnel heads east, it would pass under the jetty adjacent to the Tideway Industrial Estate as close to the south bank of the river as possible in order to minimise the length of the Heathwall/SWSR connection tunnel.

B.2.15 The main tunnel continues to the south of the river centreline and would pass below the first span (from the south) of Vauxhall Bridge to minimise the length of the Clapham/Brixton connection tunnel, while remaining clear of existing buildings.

B.2.16 The main tunnel heads northwards and crosses the central span of Lambeth Bridge and beneath the Jubilee Line tunnels. As the main tunnel approaches the Victoria Embankment Foreshore site, it would move to the west side of the river centreline, passing under the third span (from the west) of Westminster Bridge and pass as close to the west side of the river as possible to reduce the length of the Regent Street connection tunnel.

B.2.17 After the Regent Street connection tunnel, the main tunnel would pass below the second span (from the west) of Hungerford Bridge and the BT St Martins General Post Office Tunnel. It would then continue on the north side of the river centreline to pass under the second span (from the north) of Waterloo Bridge. Approaching the Blackfriars Bridge Foreshore CSO drop shaft (online), the main tunnel moves across to the north side of the river with a straight section to take the tunnel alignment through the proposed drop shaft.

Blackfriars Bridge Foreshore to Chambers Wharf

B.2.18 The main tunnel would pass below the middle of the second spans (from the north) of Blackfriars road and rail bridges. From the east of the Blackfriars bridges, the tunnel follows the middle of the river as far as possible, passing below the middle spans of Millennium Bridge, Southwark Bridge, Cannon Street Bridge, London Bridge and Tower Bridge.
B.2.19 After crossing Tower Bridge mid span, the alignment moves across to the southern side of the river in front of St Saviour’s Dock. This section of the route has been moved away from the main navigational channel of the river.

Chambers Wharf to King Edward Memorial Park Foreshore

B.2.20 The main tunnel alignment would cross from the south bank of the river at the Chambers Wharf main shaft, to the north bank at King Edward Memorial Park Foreshore.

King Edward Memorial Park Foreshore to Abbey Mills Pumping Station

B.2.21 From the King Edward Memorial Park Foreshore CSO drop shaft (on line), the main tunnel continues eastwards towards the entrance to the Limehouse Basin. The alignment would turn northward to pass under the Old Sun Wharf as it cuts across towards the east side of the basin.

B.2.22 North of the basin, the main tunnel threads between the tower block buildings of Basin Approach, to avoid passing directly beneath these structures. The main tunnel alignment also avoids the high-rise buildings of Park Height Court on Wharf Lane and The Mission on Commercial Road. It then follows the Limehouse Cut towards Abbey Mills Pumping Station.

B.2.23 Following the Limehouse Cut as far as the Blackwall Tunnel Northern Approach Road, the main tunnel would pass under the low rise buildings at Barratt Industrial Park as it turns to a more northerly direction across the River Lee. Keeping to the west of the gas holders, the main tunnel would cross under the surface rail tracks of the District Line and across the Channelsea River, passing into the Abbey Mills Pumping Station land where the main shaft is located.

Hammersmith connection tunnel

B.2.24 The Hammersmith connection tunnel would join the Hammersmith Pumping Station drop shaft to the main tunnel under the river. The connection tunnel would pass through a new development that is proposed on the east bank of the river.

West Putney connection tunnel

B.2.25 The West Putney connection tunnel would be approximately 220m long and would join the Barn Elms CSO drop shaft, on the south side of the Beverly Brook gas main, to the main tunnel.

Putney Bridge connection tunnel

B.2.26 The Putney Bridge connection tunnel would join the Putney Embankment Foreshore CSO drop shaft with the main tunnel under the river.

Frogmore connection tunnel

B.2.27 The Frogmore connection tunnel would be approximately 1,100m long and connect the CSO drop shaft at King George’s Park to the main tunnel at Carnwath Road Riverside main tunnel shaft via the online drop shaft at the
Dormay Street site. This tunnel would pass through a built-up area with existing tunnels. Consequently, the route is relatively convoluted.

B.2.28 At King George’s Park the connection tunnel heads north from the drop shaft under Buckhold Road, 3.0m above and parallel to the proposed National Grid Tunnel. A 100m radius curve has been introduced to avoid the proposed and recent multi-storey development properties on the west side of Buckhold road and also the existing shopping centre and car park on the east side of Buckhold Road.

B.2.29 From the north of Wandsworth High Street, the connection tunnel generally follows Church Row and Wandsworth Plain to avoid passing directly beneath All Saint's Church and the other buildings along these roads. It then passes beneath the buildings between Frogmore and Dormay Streets before reaching the drop shaft at Dormay Street. The tunnel would also avoid passing beneath buildings with deep piled foundations along Frogmore.

B.2.30 The connection tunnel alignment continues through the drop shaft and then follows the line of Bell Lane Creek into the River Thames and under the viaduct. The connection tunnel would join the main tunnel at Carnwath Road Riverside main tunnel shaft after crossing the Thames.

**Falconbrook connection tunnel**

B.2.31 The Falconbrook connection tunnel links the Falconbrook Pumping Station CSO drop shaft to the main tunnel at a chamber mid-river. The connection tunnel would pass between proposed developments at Bridges Wharf and Prices Court. The alignment might need local adjustment once the final details of the two developments are known. The connection tunnel would cross under the existing UKPN Wimbledon Pimlico cable tunnel beneath York Road.

**Lots Road connection tunnel**

B.2.32 The Lots Road connection tunnel would join the Cremorne Wharf CSO drop shaft and the main tunnel under the river.

**Ranelagh connection tunnel**

B.2.33 The Ranelagh connection tunnel would join the Chelsea Embankment Foreshore CSO drop shaft and the main tunnel under the river. The drop shaft would be situated within the safeguarded zone for the proposed Crossrail Chelsea to Hackney Line and there is on-going dialogue with the asset owner.

**Heathwall/SWSR connection tunnel**

B.2.34 The Heathwall/SWSR connection tunnel would join the Heathwall Pumping Station CSO drop shaft to the main tunnel. The main tunnel is aligned to make this connection tunnel as short as possible within the constraints of third party infrastructure.

**Clapham/Brixton connection tunnel**

B.2.35 The Clapham/Brixton connection tunnel would join the Albert Embankment Foreshore CSO drop shaft to the main tunnel under the river. The main
Appendices

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Regent Street connection tunnel

B.2.36 The Regent Street connection tunnel would join the Victoria Embankment Foreshore CSO drop shaft to the main tunnel under the river. The main tunnel is aligned to make this connection tunnel as short as possible within the constraints of third party infrastructure.

Greenwich connection tunnel

B.2.37 The Greenwich connection tunnel would be approximately 4,600m long and link the CSO drop shafts at the Greenwich Pumping Station, Deptford Church Street and Earl Pumping Station sites and connect them to the main tunnel shaft in Chambers Wharf. This connection tunnel would be constructed entirely in Chalk. It would pass through a dense urban area, which would make it impossible to avoid existing buildings and infrastructure completely.

B.2.38 The vertical alignment for this connection tunnel is constrained by the operational Jubilee Line tunnels and the proposed UK Power Networks New Cross to Wellclose Square Cable Tunnel, which both pass above the connection tunnel. To minimise the impact, the connection tunnel alignment has been lowered to increase clearance to the Jubilee Line to approximately 10m.

B.2.39 From Chambers Wharf, the connection tunnel heads in a southerly direction under residential properties in Bevington Street, Riverside Primary School and properties in Spenlow House. The connection tunnel then passes underneath Jamaica Road at almost 90°, before passing beneath low rise residential property and heading in an approximately south east direction towards Southwark Park. Prior to entering the park, the connection tunnel would navigate between the foundations of two six-storey buildings, namely Lockwood Square and Marden Square.

B.2.40 The connection tunnel would then pass under the centre portion of the park, traversing to the south eastern end towards Surrey Quays Station on the London Overground Network. The connection tunnel would pass next to a new piled building bounding the London Overground Station before passing further south next to the high-rise building of Dunlin House, and under the high rise building of Jura House and Husborne House before meeting the CSO drop shaft at Earl Pumping Station.

B.2.41 The connection tunnel exits at the CSO drop shaft at Earl Pumping Station towards Yeoman Street industrial works and saw mill. The connection tunnel would then align between high-rise buildings at Pendennis House, Argosy House, and Eddystone Tower.

B.2.42 The connection tunnel would then pass beneath the industrial units of Crown Wharf scrap yard, New Baltic Wharf, Park Wharf, and Bridge Wharf before aligning below Evelyn Street.

B.2.43 The connection tunnel follows the alignment of Evelyn Road until Langford House, where the alignment turns south towards the CSO drop shaft at Deptford Church Street and passes under the low rise Akwaaba Centre.
B.2.44 The connection tunnel would leave the CSO drop shaft at Deptford Church Street before passing under the rail viaduct for the main line trains to London Bridge, passing close to the lifting bridge on Deptford Creek, under the precast DLR viaduct to the final CSO drop shaft at Greenwich Pumping Station.
Appendix C – Where to find documents and plans

C.1.1 The documents, plans and maps showing the nature and location of the proposed development are available for inspection free of charge from 16 July 2012 to 5 October 2012 [confirm date] at the locations specified in Table 2 during their published opening hours.

C.1.2 Asterisks indicate the format in which the documents are available for viewing at each of the specified locations as follows:

a. * hard copy of documents, plans and maps

b. ** electronic copy of documents, plans and maps on the project’s website (www.thamestunnelconsultation.co.uk).

Table C.1 Location and format of documents and plans

<table>
<thead>
<tr>
<th>Tunnel section/Site</th>
<th>Location and format of information available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main tunnel route</td>
<td>Hounslow Civic Centre, Lampton Road, TW3 4DN*; Chiswick Library, Duke’s Avenue, W4 2AB*; and at all other locations specified below</td>
</tr>
<tr>
<td>Acton Storm Tanks</td>
<td>Ealing Town Hall, Perceval House, 14-16 Uxbridge Road, W5 2BY*; Ealing Central Library, 103 Ealing Broadway Centre, The Broadway, W5 5JY <strong>; Acton Library, High Street, Acton W3 6NA</strong></td>
</tr>
<tr>
<td>Hammersmith Pumping Station</td>
<td>Hammersmith and Fulham Town Hall, King Street, W6 9JU*; Hammersmith Library, Shepherds Bush Road, W6 7AT **</td>
</tr>
<tr>
<td>Barn Elms</td>
<td>Richmond upon Thames Civic Centre, 44 York Street, TW1 3BZ*; Wandsworth Town Hall, Wandsworth High Street, SW18 2PU*; Castelnau Library, 75 Castelnau SW13 9RT **; Richmond Information Centre, Old Town Hall, Whittaker Avenue, TW9 1TP **</td>
</tr>
<tr>
<td>Putney Embankment Foreshore</td>
<td>Wandsworth Town Hall, Wandsworth High Street, SW18 2PU*; Putney Library, 5/7 Disraeli Road SW15 2DR **</td>
</tr>
<tr>
<td>Carnwath Road Riverside</td>
<td>Hammersmith and Fulham Town Hall, King Street, W6 9JU **; Fulham Library, 598 Fulham Road, Fulham, SW6 5NX **; Sands End Library, The Community Centre, 59 Broughton Road, Fulham, SW6 2LE **</td>
</tr>
<tr>
<td>Frogmore connection tunnel route, Dormay Street King George’s Park and Falconbrook Pumping Station</td>
<td>Wandsworth Town Hall, Wandsworth High Street, London SW18 2PU*; Wandsworth Town Library, 11 Garratt Land, Wandsworth, SW18 4AQ**; York Gardens Library, 34 Lavender Road, SW11 2UG **</td>
</tr>
<tr>
<td>Tunnel section/Site</td>
<td>Location and format of information available</td>
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</tr>
<tr>
<td>Cremorne Wharf Depot and Chelsea Embankment Foreshore</td>
<td>Kensington and Chelsea Town Hall, Hornton Street, W8 7NX *; Chelsea Library, Chelsea Old Town Hall, King’s Road, SW3 5EZ **; Kensington Central Library, 12 Phillimore Walk, Kensington, W8 7SA **</td>
</tr>
<tr>
<td>Kirtling Street and Heathwall Pumping Station</td>
<td>Wandsworth Town Hall, Wandsworth High Street, SW18 2PU **; Battersea Park Library, 309 Battersea Park Road, SW11 4NF **; South Lambeth Library, 180 South Lambeth Road, SW8 1QF **</td>
</tr>
<tr>
<td>Albert Embankment Foreshore</td>
<td>Lambeth Council, Phoenix House, St George Wharf, Wandsworth Road, SW8 2LL *; South Lambeth Library, 180 South Lambeth Road, SW8 1QF **</td>
</tr>
<tr>
<td>Victoria Embankment Foreshore</td>
<td>Westminster City Hall, 64 Victoria Street, SW1E 6QP *; Victoria Library, 160 Buckingham Palace Road, SW1W 9UD **; Pimlico Library, Rampayne Street, SW1V 2PU **</td>
</tr>
<tr>
<td>Blackfriars Bridge Foreshore</td>
<td>City of London, Gresham Street, London EC2P 2EJ *; Guildhall Library, 5 Aldermanbury, EC2V 7HH **; Shoe Lane Library, Hill House, Little New Street, EC4A 3JR **</td>
</tr>
<tr>
<td>Chambers Wharf and Shad Thames Pumping Station</td>
<td>Southwark Council, 160 Tooley Street, SE1 2QH *; John Harvard Library, 211 Borough High Street, SE1 1JA **; Canada Water Resource Centre, 21 Surrey Quays Road, SE16 7AR **</td>
</tr>
<tr>
<td>Greenwich connection tunnel route</td>
<td>At the locations specified for Earl Pumping Station, Deptford Church Street and Greenwich Pumping Station.</td>
</tr>
<tr>
<td>Earl Pumping Station</td>
<td>Lewisham Town Hall, 5th Floor, Laurence House, Catford Road, London SE6 4RU *; Canada Water Resource Centre, 21 Surrey Quays Road, SE16 7AR **; Pepys Resource Centre, Old Library, Deptford Strand, SE8 3BA **</td>
</tr>
<tr>
<td>Deptford Church Street</td>
<td>Lewisham Town Hall, 5th Floor, Laurence House, Catford Road, SE6 4RU *; Canada Water Resource Centre, 21 Surrey Quays Road, SE16 7AR **; Lewisham Library, 199-201 Lewisham High Street, SE13 6LG **; Pepys Resource Centre, Old Library, Deptford Strand, SE8 3BA **</td>
</tr>
<tr>
<td>Greenwich Pumping Station</td>
<td>Royal Borough of Greenwich, Town Hall, Wellington Street, London SE18 6PW *; West Greenwich Library, 146 Greenwich High Road, London SE10 8NN **</td>
</tr>
<tr>
<td>King Edward Memorial Park Foreshore and Bekesbourne Street</td>
<td>Newham Town Hall, 1000 Dockside Road, London E16 2QU *; Tower Hamlets Council Town Hall, Mulberry Place, 5 Clove Crescent, London E14 2BG **; Tower Hamlets Ideas Store, Gladstone Place, Bow, London E3 5ES **; Tower Hamlets Ideas Store, Churchill Place, Canary Wharf, London E14 5RB **</td>
</tr>
</tbody>
</table>
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### Tunnel section/Site

<table>
<thead>
<tr>
<th>Tunnel section/Site</th>
<th>Location and format of information available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Mills Pumping Station and Beckton Sewage Treatment Works</td>
<td>Newham Town Hall, 1000 Dockside Road, London E16 2QU*; Stratford Library, 3 The Grove, Stratford, London E15 1EL **</td>
</tr>
</tbody>
</table>

#### 5.1.8

The documents, plans and maps showing the nature and location of the proposed development are available for inspection from 16 July to 5 October 2012 at the locations specified above during published opening hours and on our website, see below.

#### 5.1.9

A CD or hard copies of these documents, plans and maps are available on request and copies can be made available in large print, Braille or audio format. To request copies of the documents, please contact us using the details specified below. A telephone translation service is also available. Please contact us on **0800 0721 086**.

#### 5.1.10

All responses to the publicity of the proposed application must be submitted by 5pm on 5 October 2012. Only written responses can be accepted. They should be submitted as follows:

- By post to: Thames Tunnel, Thames Water, Freepost SCE 9923, PO Box 522, Swindon SN2 8LA
- By email to [thames.tunnel@thameswater.co.uk](mailto:thames.tunnel@thameswater.co.uk)
- Online via the project website: [www.thamestunnelconsultation.co.uk](http://www.thamestunnelconsultation.co.uk)
For further information or to comment on our proposals please see our website: www.thamestunnelconsultation.co.uk

It is very important that you understand the information we have provided. If you need further information in another language, braille, large print or audio format please contact us on 0800 0721 086.