

**Thames Tideway Tunnel**  
Thames Water Utilities Limited



# Application for Development Consent

Application Reference Number: WWO10001

## Final Report on Site Selection Process

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### **Volume 13**

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**Thames  
Tideway Tunnel**



Creating a cleaner, healthier River Thames

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# Thames Tideway Tunnel

## Final Report on Site Selection Process

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# Thames Tideway Tunnel

## Final Report on Site Selection Process Volume 13: Kirtling Street (formerly Tideway Walk)

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# 1 Introduction

## 1.1 Introduction to the Thames Tideway Tunnel project

- 1.1.1 At present, untreated sewage mixed with rainwater (combined sewage) regularly overflows into the tidal reaches of the River Thames from London's Victorian sewerage system via combined sewer overflows (CSOs).
- 1.1.2 Combined sewage discharges must be reduced in order to comply with relevant wastewater legislation. The primary objective of the proposed Thames Tideway Tunnel project (the 'project') is to control discharges from CSOs in order to meet the requirements of the European Union's Urban Waste Water Treatment Directive (91/271/EEC) (UWWTD) and the related United Kingdom legislation.
- 1.1.3 The Environment Agency has identified 34 'unsatisfactory' CSOs that the project needs to address. The project would control CSO discharges by intercepting and diverting combined sewage flows into a new storage and transfer tunnel. The 'main tunnel' would run from west London to Abbey Mills in the east where it would connect to the Lee Tunnel. The Lee Tunnel would then transfer the flows to Beckton Sewage Treatment Works for treatment.

## 1.2 Introduction to this volume

- 1.2.1 The *Site selection methodology paper* states that the project team shall produce a final report that sets out the site selection process in full. This *Final Report on Site Selection Process* was prepared for that purpose. Volume 1 of this report explains our approach to identifying the sites required to construct and operate the project and includes a glossary of relevant terminology. Volume 2 comprises the complete *Site selection methodology paper* and *Site selection background technical paper*, which were the main documents that guided the site selection process. Volumes 3 to 23 describe the site selection process for each of the sites considered on the Abbey Mills route.
- 1.2.2 This volume sets out the site selection process that was followed to identify the most suitable site to construct the central sections of the main tunnel at each phase of the pre-application process. This is summarised below in Table 1.1.

**Table 1.1 Summary of sites identified at each phase of the pre-application process**

Phase	Site name	Site use
Phase one consultation	Tideway Walk	To drive the main tunnel to King's Stairs Gardens, receive the main tunnel from Barn Elms and intercept

Phase	Site name	Site use
		the Heathwall Pumping Station and South West Storm Relief CSOs
Phase two consultation	Kirtling Street *	To drive the main tunnel west to Carnwath Road Riverside and drive the main tunnel east to Chambers Wharf
Section 48 publicity	Kirtling Street *	As above
Submission of the application	Kirtling Street *	As above

\* NB: A site at Heathwall Pumping Station would be used to intercept the Heathwall Pumping Station and South West Storm Relief CSOs (see Volume 14).

1.2.3 This volume is structured as follows:

- a. This section describes the type of site needed and summarises how the *Site selection methodology paper* was applied at each stage of the pre-application process.
- b. Section 2 explains how we identified our preferred main tunnel site for phase one consultation.
- c. Section 3 details the post phase one consultation site selection review and explains why we changed our main tunnel site for phase two consultation.
- d. Section 4 describes the post phase two consultation site selection review and how we confirmed our proposed main tunnel site for Section 48 publicity.
- e. Section 5 describes the post Section 48 publicity site selection review and confirms our selected main tunnel site for the application.

## 1.3 Type of site

1.3.1 We needed to identify a series of suitable sites to allow us to build and operate the main tunnel. The main tunnel would transfer the collected overflows to the Abbey Mills Pumping Station, which would then be transferred via the Lee Tunnel (under construction) to Beckton Sewage Treatment Works.

1.3.2 Larger sites are required where a tunnel boring machine (TBM) would be inserted into the ground (known as main tunnel drive sites). This type of site would need to handle all the materials excavated by the TBM as it constructs that section of the tunnel. Smaller sites are required to remove the TBM from the ground at the end of a tunnel drive (known as main tunnel reception/intermediate sites). A more detailed description of the different types and sizes of site required to construct and operate the project can be found in the *Site selection background technical paper*.

### 1.4 Site selection process

- 1.4.1 The *Site selection methodology paper* recognises the vital complementary relationship between the site selection process and engineering design developments. Accordingly, as the site selection process progressed it was increasingly important to compare sites against engineering requirements. A fundamental consideration was the need to identify enough sites in the right locations to enable the project to be built.
- 1.4.2 All potential sites were identified in accordance with our *Site selection methodology paper*, which involved a ‘sieving’ approach that commenced with the identification of all potentially suitable areas of land (excluding concentrated residential sites and World Heritage Sites). The main tunnel sites went through levels of increasingly detailed assessments. All the assessments were informed by a multidisciplinary approach that took into account engineering, planning, environmental, community and property considerations and our teams’ professional judgement.
- 1.4.3 Prior to phase one consultation, we applied our multidisciplinary sieving approach to all the assessments outlined in the *Site selection methodology paper* (summarised at paragraph 2.1.2) for all three main tunnel route options under consideration at this stage of the pre-application process. This process is set out below in Section 2. In Volume 1, Section 4 there is a more detailed discussion of the tunnelling options and comparisons for the main tunnel on the three proposed routes.
- 1.4.4 Following phase one consultation, we reviewed the preferred site and decided to carry out a ‘back-check’ (as set out in the *Site selection methodology paper*) in order to review the preferred and shortlisted sites prior to phase two consultation. This back-check involved a repeat of each relevant stage of our site selection process to reconsider which sites would be most suitable to construct the main tunnel, including a re-examination of main tunnel drive options, to identify the preferred main tunnel site and use. The back-check utilised the same multidisciplinary approach that was followed prior to phase one consultation. The results of this back-check process are presented below in Section 3 and superseded all previous assessments undertaken prior to phase one consultation and reported in Section 2. This is the result of the iterative nature of the process. In Volume 1, Section 6 there is a more detailed discussion of the tunnelling options and comparisons for the main tunnel on the preferred Abbey Mills route.
- 1.4.5 Following phase two consultation, we reviewed the possible main tunnel sites. This involved re-checking the selection of sites identified as most suitable main tunnel sites associated with the preferred Abbey Mills route in order to confirm the proposed main tunnel sites and uses for Section 48 publicity. This process is set out below in Section 4 (also see Volume 1, Section 7 for tunnelling review).
- 1.4.6 Following Section 48 publicity, we reviewed our proposals having regard to the feedback from the publicity exercise. The purpose of this review was to define and decide any changes to our final proposals for the

application. Every proposed main tunnel site on the Abbey Mills route was re-checked in order to confirm its selection for the application. This process is set out in Section 5. In Volume 1, Section 8 there is a review of tunnelling options and comparisons for the main tunnel on proposed Abbey Mills route.

## 2 Phase one consultation preferred main tunnel site: Site selection process

### 2.1 Introduction

- 2.1.1 This section explains how the *Site selection methodology paper* was implemented in order to arrive at the preferred main tunnel site for the central sections of the tunnel for phase one consultation. This stage took place from Spring 2009 to Summer 2010.
- 2.1.2 In order to arrive at the preferred site for phase one consultation, the site selection process comprised:
- a. identification of sites for inclusion on a long list
  - b. assessment of sites on the long list to create a draft short list
  - c. assessment of the draft shortlisted sites to create a final short list
  - d. preparation of detailed site suitability reports for each final shortlisted site; preparation of the Engineering options report (Spring 2010) with the tunnelling drive options
  - e. a multidisciplinary optioneering workshop to consider the suitability of each of the shortlisted sites for each use (drive and/or reception/intermediate, depending on site size) in each main tunnel zone. The workshop then used these sites to consider the tunnelling options to determine the preferred phase one consultation main tunnel site and use (see Volume 1, Section 4 for detailed discussion of tunnelling drive options and comparisons).
- 2.1.3 The assessments described in this section were based on the information available at the time and the related stage in the pre-application process. The assessments in this section comprise a historic representation of the process and all of the assessments have been superseded by the ones set out in Section 3.

### 2.2 Assessment of the long list sites

- 2.2.1 The long list of potential main tunnel sites for the central sections of the tunnel route was created by conducting a desktop survey of the land in the London boroughs of Wandsworth, Southwark and Lambeth, the Royal Borough of Kensington and Chelsea, Westminster and City of London.
- 2.2.2 In total, 157 sites were included on the long lists. The sites were assessed having regard to the high-level considerations set out in Table 2.2 of the *Site selection methodology paper* (hereafter referred to as SSMP Table 2.2), which included engineering (site size, site features, availability of a jetty/wharf, and access), planning and environment (heritage, landscape/townscape, open space and ecology), and community and property (neighbouring land uses, site use, Special Land/Crown land and acquisition costs) considerations.

- 2.2.3 Sites that were determined to be the least constrained in light of the SSMP Table 2.2 considerations passed to the draft short list. This did not necessarily mean that these main tunnel sites were ultimately judged to be suitable, but rather that no significant constraints were identified in relation to the high-level considerations set out in SSMP Table 2.2. Sites that were judged to be more constrained were not retained on the draft short list for more detailed assessment.
- 2.2.4 We then determined how the size of the sites that were retained at this stage would be assessed under the next stage of assessment. For some sites, this included examining neighbouring sites to see if they could be used together. The SSMP Table 2.2 assessments and plans are available on request and form part of our extensive evidence base.
- 2.2.5 Of the 157 sites identified on the long list of potentially suitable main tunnel sites for the central sections of the tunnel route, 26 were assessed as potentially suitable and passed to the draft short list, and 131 sites were eliminated as unsuitable.

### 2.3 Assessment of the draft short list sites

- 2.3.1 The remaining 26 draft short list main tunnel sites identified as potentially suitable at SSMP Table 2.2 were further assessed by the engineering, planning, environment, community and property disciplines. Regard was taken of the considerations set out in Table 2.3 of the *Site selection methodology paper* (hereafter referred to as SSMP Table 2.3) which included: engineering (site size, distance and route to the river, jetty/wharf facilities, means of road/rail access, site features, site efficiency, tunnelling and systems engineering requirements); planning and environment (planning applications/permissions, London Plan/UDP/LDF allocations or special policy areas, heritage designations, landscape/open space designations, ecological designation, transport and amenity); property (ownership of site, tenant on site, estimated acquisition cost, Crown land and special land, access and material transfer rights) and community (proximity to sensitive receptors, social, economic, health and equality considerations). This stage of the process built on the information gathered and the assessments undertaken at long list stage but focussed on more detailed local considerations.
- 2.3.2 At this stage, we also consulted with each of the London boroughs and pan-London stakeholders, such as the Environment Agency and English Heritage, to seek their views on the suitability of the sites for the short list.
- 2.3.3 As with the SSMP Table 2.2 assessment, sites that were assessed as the least constrained in light of the SSMP Table 2.3 considerations were retained on the short list and passed to the next stage of assessment. This did not necessarily mean that a site was ultimately judged suitable, but rather that no significant constraints were identified in relation to the considerations set out at SSMP Table 2.3. Sites that were judged to be more constrained were not retained on the short list for more detailed assessment. The decision of whether or not to retain a site on the short list was taken at a multidisciplinary workshop. The SSMP Table 2.3

assessments and plans are available on request and form part of our extensive evidence base.

- 2.3.4 Of the 26 sites on the draft short list, seven were assessed as potentially suitable as a main tunnel drive or reception/intermediate sites, and six were assessed as suitable for main tunnel reception/intermediate sites. All 11 of these sites passed to the final short list but the remaining 15 sites did not.

## 2.4 Assessment of the final short list sites

- 2.4.1 The 11 sites identified for the inclusion on the final short list were then reviewed to identify opportunities to combine sites to provide parcels of land which could be used as either main tunnel drive or main tunnel reception/intermediate sites. The final shortlist of sites identified for assessment at the next stage were:

### **Suitable for use as a main tunnel drive or reception/intermediate site:**

- a. S61WH: Battersea Park
- b. S68WH: Battersea Power Station
- c. S68WH with S69WH: Industry/warehouses, Cringle Street
- d. S69WH: Industry/warehouses, Cringle Street
- e. S73WH with S79WH: Industry/warehouses, Tideway Walk
- f. S74WH with either S72WH or S73WH or S79WH: Industry/warehouses, Tideway Walk
- g. S79WH with S80WH: Tideway Walk and TWUL Pumping Station including Middle Wharf.

### **Suitable as main tunnel reception/intermediate sites only:**

- a. S72WH: Concrete batching plant and wharf, Cringle Street
- b. S73WH: Industry/warehouses, Tideway Walk
- c. S79WH: Warehouses, Tideway Walk
- d. S87WH: Warehouse, Post Office Way
- e. S04WR: Open space, Grosvenor Road
- f. S11WR: Foreshore, adjacent to Riverwalk House and Vauxhall Bridge.

- 2.4.2 A site suitability report was prepared for each of these final shortlisted sites. These reports contained an assessment of each site's suitability in light of engineering, planning, environment, community and property considerations. At this stage in the process, no comparisons were drawn between other sites; they were assessed in isolation and with no regard to tunnelling strategy. Sites were evaluated by each discipline using our teams' technical knowledge and professional judgement as appropriate, and assessed as suitable, less suitable or not suitable from that discipline's perspective based on the available information at this stage of the pre-application process.

2.4.3 A summary of the conclusions of each discipline's assessment from the site suitability reports is provided below.

### **S61WH: Battersea Park**

2.4.4 Site S61WH is located in Battersea Park, a Grade II\* registered park and garden which contains woodland, grassed areas, a lake, gardens and a diverse range of community facilities and public amenities. The site is bounded to the north by the River Thames, to the east by Queenstown Road and Chelsea Bridge, to the west by Albert Bridge Road and to the south by Prince of Wales Drive. The site is located in the London Borough of Wandsworth.

2.4.5 The site was assessed for use as a main tunnel double drive site (ie driving the tunnel in two directions from this site), main tunnel single drive site and a main tunnel reception/intermediate site.

2.4.6 **Engineering:** The site was considered **suitable** for use as a main tunnel double drive, single drive or reception/intermediate site. This was predominantly due to the good site size, river and road access. Also, the locations of the proposed shafts would be sufficiently far away from major third-party assets such as the Crossrail Line 2 Safeguarded Zone, Albert Bridge and Chelsea Bridge to avoid impacting on them.

2.4.7 **Planning:** The site was considered **not suitable** for use as a main tunnel double drive or single drive site. This was predominantly due to the scale of proposed works and the land-take required, which was considered too great for this sensitive location, which is subject to a number of policy designations. The conflict with planning policies, including those relating to heritage conservation, Metropolitan Open Land and public open space, would very likely be unacceptable, particularly given the scale, longevity and prominence of both the construction works and after-structures.

2.4.8 The site was considered **less suitable** for use as a main tunnel reception/intermediate site due to the reduced scale of construction activity and permanent land-take. Significant mitigation would, however, be required.

2.4.9 **Environment:** Overall, the site was considered **less suitable** for use as all types of site. The site was considered **suitable** from the perspectives of transport, archaeology, water resources, flood risk, air quality, noise and land quality. However, the site was considered **less suitable** from the perspectives of built heritage, townscape and ecology.

2.4.10 **Socio-economic and community:** The site was considered **not suitable** for use as a main tunnel double drive site due to the likely cumulative community impacts. The areas of the park directly affected by the proposed double drive main tunnel site were likely to be valued by the community as an area of open space. Based on its current use, Chelsea Bridge Fields appears to be a unique open space within Battersea Park, due to its elevation and tree cover. The riverside edge of Festival Pleasure Gardens offers views across the river and over the park and is therefore likely to be popular.

- 2.4.11 The site was considered **less suitable** for use as a main tunnel drive or reception/intermediate site. As with the main tunnel double drive site, it appears that the area of the park proposed for use as a main tunnel drive or reception/intermediate site is valued by the community as an area of open space.
- 2.4.12 **Property:** The site was considered **suitable** for use as a main tunnel single drive or reception/intermediate site. The level of risk would increase with the land area required and the impact on the park's amenities. The area required for a main tunnel double drive site was considered to be unacceptably large in this context, and the site was therefore considered **not suitable**.

### S68WH: Battersea Power Station and S68WH with S69WH: Industry/warehouses, Cringle Street

- 2.4.13 Sites S68WH and S69WH are located, adjacent to the railway lines that run parallel to Chelsea Bridge and located directly on the riverfront. Site 68WH is occupied by the disused Grade II\* listed Battersea Power Station. Site S69WH is occupied by two industrial buildings, which are surrounded by general purpose hardstanding for parking and loading/unloading, although the southern area of S69WH is narrow and less useable. Both sites are irregular in shape. Access is via Cringle Street. The site is located in the London Borough of Wandsworth
- 2.4.14 The site was assessed as a split main tunnel double drive site, which would involve two shafts on a site, including both S68WH and S69WH, to drive the main tunnel in two directions; a main tunnel drive site using only S68WH; and main tunnel reception/intermediate site using only S68WH.
- 2.4.15 **Engineering:** The site was considered **less suitable** for use as either a split main tunnel double or single drive site or a reception/intermediate site. The presence of Battersea Power Station would restrict site traffic and, for a main tunnel double and single drive site, the length of river frontage available was insufficient to accommodate the necessary jetties. For all site types, there were also potential problems with contaminated land and numerous underground structures that would impact on the shaft location, which might require enabling works and protection measures. It is also possible that there are other underground structures associated with the power station in addition to those currently identified.
- 2.4.16 **Planning:** The site was considered **less suitable** for use as a split main tunnel double or single drive site as construction would require significant land-take across the site and a substantial amount of construction activity both on-site and in the river. This level of construction activity would reduce the potential to redevelop the site in parallel with other uses, which could cause delay or even hinder the potential regeneration of such a prominent site. Potential impacts on the appearance and setting of the Grade II\* Battersea Power Station listed building would likely require significant mitigation and the level of disruption might be unacceptable.
- 2.4.17 The site was considered **suitable** for use as a main tunnel reception/site as, due to the smaller site size required, it might be possible to implement regeneration proposals alongside the use of the site for the project.

- 2.4.18 Under all three proposed scenarios, the design, permanent access and particularly visual impact of the remaining after-use structures would also require further consideration in relation to the Grade II\* listed power station and future regeneration plans.
- 2.4.19 **Environment:** Overall, the site was considered **suitable** for use for all three scenarios, although mitigation would be required.
- 2.4.20 Based on the information available at the time, the sites were considered **suitable** from the perspectives of transport, archaeology, water resources, flood risk, air quality, and noise. The sites were considered **less suitable** from the perspective of built heritage, townscape, ecology and land quality.
- 2.4.21 **Socio-economic and community:** The site was considered **suitable** for use for all three scenarios, as it appears that it would be unlikely to have a significant impact on the local community due to the existing industrial and commercial land uses around the site.
- 2.4.22 Industrial and commercial properties in the vicinity of the site appeared most likely to be impacted by the proposed use of the site. Of these premises, it appears that the adjacent Cringle Dock Refuse Transfer Station to the east, which is used by residents of the borough, would be most likely to be affected.
- 2.4.23 **Property:** This site was considered **not suitable** for all three scenarios due to significant acquisition costs.

### S69WH: Industry/warehouses, Cringle Street

- 2.4.24 Site S69WH is situated on industrial land in the Nine Elms Industrial Area, at the end of Cringle Street between Cringle Dock Refuse Transfer Station and the Grade II\* listed Battersea Power Station. A Grade II listed Thames Water Pumping Station occupies part of the southern end of the site. The site is located in the London Borough of Wandsworth.
- 2.4.25 The site was assessed as a main tunnel reception/intermediate site only.
- 2.4.26 **Engineering:** The site was considered **suitable** for use as a main tunnel reception/intermediate site based on its size and accessibility. There were potential constraints that would require further investigation in order to finalise an assessment of overall suitability, such as final existing tunnel alignments and potential contamination issues.
- 2.4.27 **Planning:** This site was considered **suitable** for use as a main tunnel reception/intermediate site. There are few planning designations that apply to the site, and it was considered that with appropriate mitigation measures, these designations would unlikely be unacceptably impacted on. Potential redevelopment of the site in conjunction with Battersea Power Station would require further consideration.
- 2.4.28 **Environment:** Overall, the site was considered **suitable** for use as a main tunnel reception/intermediate site. However, mitigation would be required to enable the site to be used. Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage and townscape, water resources, ecology, air

quality and noise. The site was considered **less suitable** from the perspectives of flood risk and land quality.

- 2.4.29 **Socio-economic and community:** Assessed the site as **suitable** for use as a main tunnel reception/intermediate site. It appears unlikely that it would have a significant impact on the local community, due to the current industrial and commercial land uses around the site. The adjacent Cringle Dock Refuse Transfer Station to the east, which is used by residents of the borough, might be affected. Mitigation might involve discussions around hours of use and access to the waste facility.
- 2.4.30 **Property:** This site was considered **less suitable** for use as a main tunnel reception/intermediate site, on the basis of the anticipated high acquisition cost relative to its size.
- 2.4.31 As many redevelopment schemes such as the Battersea Power Station proposals are progressing slowly due to current economic conditions, this site looked favourable. However, development aspirations might mean that any land acquisition and associated diminution in value could prompt a significant claim by the landowner.

### **S73WH: Industry/warehouses, Tideway Walk and S73WH with S79WH: Industry/warehouses, Tideway Walk**

- 2.4.32 Site S73WH is situated on land occupied by an industrial warehouse in the Nine Elms Industrial Area. The site fronts onto Kirtling Street to the south and is bounded by the River Thames to north. The Cringle Street ready-mix concrete depot is situated to the west of the site and Tideway Industrial Estate is situated to the east. The site consists of a single warehouse building and a small, general purpose area for loading/unloading and site parking.
- 2.4.33 Site S73WH was considered as a main tunnel reception/intermediate site and as a split main tunnel drive site with S79WH.
- 2.4.34 **Engineering:** The site was considered **suitable** for use as a split main tunnel drive site with S79WH in terms of size and access by road. However, availability of jetty/wharfage facilities is critical and might not be possible at this location. Overall, the site was considered **suitable** for use as a split main tunnel drive site, subject to availability of jetty/wharfage facilities.
- 2.4.35 The site was considered **suitable** for use as a main tunnel reception/intermediate site; it is of adequate size and has good potential for access by road.
- 2.4.36 **Planning:** The site was considered **suitable** for use as either a split main tunnel drive site with S79WH or as a reception/intermediate site. There are few planning designations that apply to the site and we considered that, with appropriate mitigation measures, these designations would unlikely be unacceptably impacted on. Potential impacts on the future use of the Battersea Power Station site required further consideration and mitigation.

- 2.4.37 **Environment:** This site was considered **suitable** for use as a split main tunnel drive or reception/intermediate site, although mitigation would be required for either purpose.
- 2.4.38 Based on the information available at the time, the site was considered **suitable** for use for both types of site from the perspectives of transport, archaeology, built heritage, townscape, hydrogeology, surface water, air quality and noise. The site was also considered **suitable** for use as a reception/intermediate site from the perspective of ecology.
- 2.4.39 This site was considered **less suitable** for use for both site types from the perspective of flood risk and land quality. The site was also considered **less suitable** for use as a split main tunnel drive site from the perspective of ecology.
- 2.4.40 **Socio-economic and community:** The site was considered **less suitable** for use as a split main tunnel drive site as, although it appeared unlikely that its use would have a significant impact on the local community, there might be livelihood implications for operators and employees of the businesses that appear likely to be lost or require relocation from the Tideway Industrial Estate. Mitigation would likely involve discussions around relocation and/or compensation.
- 2.4.41 The new material jetty and excavated materials loading jetty proposed for the split main tunnel drive site might affect the use of the existing jetty to the east of the site, which has mooring posts and residential boats, and the jetty for the concrete batching plant adjacent to the site to the west. Mitigation might involve discussions around relocation of jetties and mooring posts, and/or disruption to neighbouring residential boats. Mitigation might also be required to reduce the potential for impact on the Thames Path and on residential properties to the east of the site.
- 2.4.42 This site was considered **suitable** for use as a main tunnel reception/site, as it is unlikely that it would have a significant impact on the local residential community due to the industrial and commercial land uses around the site. However, there might be livelihood implications for operators and employees of the warehouse, which appear likely to be lost or require relocation. Mitigation would likely involve discussions around relocation and/or compensation.
- 2.4.43 There is also the potential that works would impact on the houseboats moored opposite the site to the east and on the Thames Path. Mitigation might be required to maintain their access and reduce potential impacts.
- 2.4.44 **Property:** The site was considered **not suitable** for use as a split main tunnel drive site due to likely substantial acquisition costs. In addition to the high land value, multiple compensation claims for business disturbance should be anticipated.
- 2.4.45 The site was considered **suitable** for use as a main tunnel reception/intermediate site, although this was likely to be a relatively expensive option.

### S72WH: Cringle Street

- 2.4.46 Site S72WH, also known as Cringle Wharf, is situated on land currently used as a materials depot in the Nine Elms Industrial Area in the London Borough of Wandsworth.
- 2.4.47 The site was considered for use as a main tunnel reception/intermediate site.
- 2.4.48 **Engineering:** This site was considered **suitable** for use as a main tunnel reception/intermediate site because of its good size, proportions and access possibilities. The location of the site would minimise the alignment diversion of the main tunnel from the centre of the river.
- 2.4.49 **Planning:** This site was considered **suitable** for use as a main tunnel reception/intermediate site. There are few planning designations that apply to the site and we considered that, with appropriate mitigation measures, these designations would unlikely be unacceptably affected. The implications of using the site without incorporating river-based transport or associated infrastructure would require further investigation in terms of compliance with the safeguarded wharf designation.
- 2.4.50 **Environment:** Overall, the site was considered **suitable** for use as a main tunnel reception/intermediate site, although mitigation would be required. Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage, townscape, hydrogeology, surface water, ecology, air quality and noise. This site was considered **less suitable** from the perspectives of flood risk and land quality. .
- 2.4.51 **Socio-economic and community:** The site was considered **suitable** for use as a main tunnel reception/intermediate site. It seemed likely that the greatest impact of the site's use would be the loss or relocation of the depot currently located onsite. Mitigation might be required to ensure the refuse transfer station adjacent to the site to the west and the warehouse adjacent to the site to the east would not be significantly affected. Mitigation might also be required to ensure the houseboats moored to the east of the site, the job centre and Brook Court would not be significantly affected by the construction works and associated vehicle movements.
- 2.4.52 **Property:** The site was considered **suitable** for use as a main tunnel reception/intermediate site. It appeared likely that use of this site would have less of an impact than other nearby sites that under consideration for potential development. However, the cost of acquisition was likely to be relatively expensive, regardless of whether the business was relocated or extinguished.

### S74WH with either S72WH or S73WH or S79WH: Industry/warehouses, Tideway Walk

- 2.4.53 The sites under consideration were S72WH, S73WH, S74WH, S79WH and S80WH. All sites combined are bounded by Cringle Dock to the west, Nine Elms Lane to the east and the River Thames to the north. The sites are all located in the Nine Elms area of the London Borough of Wandsworth.

- 2.4.54 Site S72WH was considered as a split main tunnel double drive site in conjunction with sites S73WH, S74WH, S79WH and S80WH.
- 2.4.55 **Engineering:** The site was considered **suitable** for use as a split main tunnel double drive site because of its size, proportions and access possibilities. Wharfage/jetty facilities would be critical for this site because of the likely material volumes from a double drive site. Demolition works would be required to accommodate the relevant temporary works, and Heathwall Pumping Station would have to be protected and maintained during the construction works.
- 2.4.56 **Planning:** The site was considered **suitable** for use as a split main tunnel double drive site. There are few planning designations that apply to the site and it is considered that, with appropriate mitigation measures, it is unlikely that these designations would be unacceptably affected. The proposal site would result in the loss of employment space and the relocation of lost facilities might be required in order to comply with LPA policy.
- 2.4.57 Consideration needed to be given to any necessary mitigation measures that would protect local residents from noise, dust and site activity, and the potential relocation of adjacent houseboats. It was also necessary to determine the impact and potential for mitigation for the existing safeguarded wharves, as well as the location and potential impacts of proposed jetty and conveyor facilities.
- 2.4.58 **Environment:** Overall, the site was considered **suitable** for use as a split main tunnel double drive site, although mitigation would be required. Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage, townscape, surface water, and air quality. This site was considered **less suitable** from the perspectives of ecology, hydrogeology, and flood risk, noise and land quality.
- 2.4.59 **Socio-economic and community:** The site was considered **less suitable** for use as a split main tunnel double drive site, as there would be a number of potential impacts on the local community and economy.
- 2.4.60 It appeared that the greatest potential impact would be the loss of, or need to relocate, the various industrial and commercial facilities onsite. In this respect, use of the site might affect the local economy through the loss of a relatively large number of businesses in one area. There might be livelihood impacts on local workers and operators. It also appeared likely that a river-dwelling community living in the houseboats moored adjacent to site S79WH would face the loss of their homes or major disruption associated with the need to relocate.
- 2.4.61 The use of site also appeared likely to require diversions or other changes to a section of the Thames Path, which was found to be a well-used, pleasant riverside environment in a predominantly industrial area.
- 2.4.62 **Property:** The site was considered **not suitable** for use as a split main tunnel double drive site, due to significant acquisition costs.

### S79WH: Warehouses, Tideway Walk

- 2.4.63 Site S79WH incorporated the Tideway Industrial Estate, industrial buildings and warehousing, as well as general purpose areas for loading/unloading and parking. The proposed site is bounded by Kirtling Street to the west, Nine Elms Lane to the southeast and the River Thames to the north. The site is located in the Nine Elms Industrial Area of the London Borough of Wandsworth.
- 2.4.64 The site was considered for use as a main tunnel reception/intermediate site.
- 2.4.65 **Engineering:** The site was considered **suitable** for use as a main tunnel reception/intermediate site due to good overall size and good road access with a short route to the TLRN. The shaft could be constructed on the river frontage. The site would, however, require significant demolition.
- 2.4.66 **Planning:** The site was considered **suitable** for use as a main tunnel reception/intermediate site. There are few planning designations that apply to the site, and it is considered that, with appropriate mitigation measures, it is unlikely that these designations would be unacceptably affected. The proposed site would result in the loss of employment space and the relocation of lost facilities might be required in order to comply with LPA policy.
- 2.4.67 Consideration needs to be given to any necessary mitigation measures that would protect nearby houseboat residents from noise, dust and site activity.
- 2.4.68 **Environment:** Overall, the site was considered **suitable** for use as a main tunnel reception/intermediate site, although mitigation would be required.
- 2.4.69 Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage, townscape, surface water, ecology, air quality and noise. This site was considered **less suitable** from the perspectives of flood risk, hydrogeology and land quality.
- 2.4.70 **Socio-economic and community:** The site was considered **less suitable** for use as a main tunnel reception/intermediate site, since significant mitigation would be required to address the impact on the businesses located on the Tideway Industrial Estate and the residents of the houseboats moored adjacent to the site.
- 2.4.71 Mitigation would likely to require discussions around relocation and/or compensation. A diversion of the Thames Path would likely affect various user groups, including local workers and residents, as well as occasional users from a wider catchment, including nature or river enthusiasts. Finding acceptable diversions to the path might be complicated as the area is primarily covered by large industrial developments.
- 2.4.72 **Property:** This site was considered **not suitable** for use as a main tunnel reception/intermediate site due to significant acquisition costs.

## S79WH with S80WH: Tideway Walk and TWUL Pumping Station

- 2.4.73 Site S79WH incorporates the Tideway Industrial Estate, a concrete batching plant and other industrial buildings and warehousing, as well as general purpose areas for loading/unloading and parking. The proposed site is bounded by Kirtling Street to the west, Nine Elms Lane to the southeast and the River Thames to the north.
- 2.4.74 S80WH is Thames Water's Heathwall Pumping Station and Middle Wharf, which is a designated safeguarded wharf and was formerly used as a concrete batching plant.
- 2.4.75 Both sites are both located in the Nine Elms Industrial Area of the London Borough of Wandsworth.
- 2.4.76 S79WH was considered for use as a split main tunnel drive site (with S80WH and C17XB, which is Middle Wharf and overlaps half of S80WH) and to intercept both the Heathwall Pumping Station CSO (CS16X) and the South West Storm Relief Sewer CSO (CS17X). The site selection process to identify a preferred site to intercept these CSOs is covered separately in Volume 14.
- 2.4.77 **Engineering:** The site was considered **suitable** for use as a split main tunnel drive site with two CSO interceptions, due to its good size and reasonable proportions, good access possibilities, and potential wharfage/jetty facilities. Demolition works would be required to accommodate the relevant temporary works, and Heathwall Pumping Station would need to be protected and maintained during the construction works.
- 2.4.78 **Planning:** The site was considered **suitable** for use as a split main tunnel drive site with two CSO interceptions. It was considered that, with appropriate mitigation measures, it is unlikely that the designations applicable to the site would be unacceptably affected. The proposed site would result in the loss of employment space and it might be necessary to relocate lost facilities in order to comply with LPA policy.
- 2.4.79 Consideration needed to be given to any necessary mitigation measures that would protect local residents from noise, dust and site activity, and the potential to relocate the existing moored houseboats on the site. It would also be necessary to determine potential impacts on the existing safeguarded wharf and appropriate locations of the two proposed jetties, to ensure the site layout arrangements are acceptable.
- 2.4.80 **Environment:** Overall, the site was considered **suitable** for use as a split main tunnel drive site with two CSO interceptions.
- 2.4.81 Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage and townscape, surface water, air quality and noise. The site was considered **less suitable** from the perspectives of groundwater, ecology, flood risk and land quality.
- 2.4.82 **Socio-economic and community:** The site was considered **suitable** for use as a split main tunnel drive site with two CSO interceptions. However,

it was likely that there would be significant impacts on the businesses operating out of the premises, which were likely to be lost if we used the site. In addition, a number of houseboats would likely require relocation, as their mooring would probably be lost or face significant disruption as a result of the proposed site configurations. Mitigation would likely involve discussions around relocation and/or compensation.

- 2.4.83 Diversions to the Thames Path, or any other change to the well-used riverside open space adjacent to the site on the north, would likely have an impact on various user groups, including local residents and local workers, as well as occasional users from a wider catchment, including nature or river enthusiasts. Finding acceptable diversions to the path might be complicated, as mitigation might be difficult in this area, which is covered with large industrial developments.
- 2.4.84 Use of the site would also likely disrupt the commercial and industrial businesses in the vicinity and could impact on the residential development to the east of the site.
- 2.4.85 **Property:** The site was considered **not suitable** for use as a split main tunnel drive site with two CSO interceptions, due to significant acquisition costs.

### S87WH: Warehouse, Post Office Way

- 2.4.86 Site S87WH is situated within the site previously occupied by the publishers TSO. It is currently vacant but there is a large complex that consists of a six-storey office block and several low-rise storage and distribution warehouses located on site. The site, which fronts onto Nine Elms Lane and is bounded to the west by the Post Office Sorting Office depot, is located in the Nine Elms Industrial Area in the London Borough of Wandsworth.
- 2.4.87 The site was considered for use as a main tunnel drive and reception/intermediate site.
- 2.4.88 **Engineering:** This site was considered **less suitable** for use as either a main tunnel drive or reception/intermediate site because of the high-level of demolition required. In addition, its location with respect to the river would require the main tunnel to deviate significantly from the centre line of the river, and the overflow culvert would need to cross the busy Nine Elms Lane. The site is also in close proximity to a number of warehouses, the stability of which might be affected by the shaft. For use as a main tunnel drive shaft, the provision of jetty facilities would be difficult and have a number of constraints. There would also be a need for overhead conveyors to transport materials to and from the site over the busy Nine Elms Lane.
- 2.4.89 **Planning:** The site was considered **less suitable** for use as a main tunnel drive site but considered **suitable** as a reception/intermediate site. There are existing industrial activities close to the residents at Elm Quay Court that already impact on the residential amenity. However, the amenity for some residents overlooking the proposed site might be further affected. Use of the proposed site might also have adverse impacts from noise,

dust and site traffic, and mitigation would be required. These impacts on residential properties were likely to be greater for the main drive shaft rather than the reception/intermediate site option, due to reduced scope for site development away from these properties.

2.4.90 The potential impacts arising from the use of the site as a reception/intermediate site were considered fewer than for a main tunnel drive site and it is likely that they could be mitigated. In the case of both proposed options, the implementation programme and potential conflicts with the proposed American Embassy on the adjacent site were uncertain at this stage, and required further consideration and on-going monitoring.

2.4.91 **Environment:** Overall, the site was considered **less suitable** for use as a main tunnel drive site. The site was considered **suitable** from the perspectives of archaeology, built heritage and townscape, surface water and air quality but considered **less suitable** from the perspectives of transport, hydrogeology, ecology, flood risk, noise and land quality.

2.4.92 Overall, the site was considered **suitable** for use as a main tunnel reception/intermediate site, although mitigation would be required. Based on the information at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage, townscape, surface water, ecology, air quality and noise. The site was considered **less suitable** from the perspectives of flood risk, hydrogeology and land quality.

2.4.93 **Socio-economic and community:** This site was considered **suitable** for use as either a main tunnel drive or reception/intermediate site. Its use might impact on the Elm Quay Court residential development opposite the site to the north, due to the proximity to the jetty for loading excavated materials and the general proximity to the site. Mitigation might therefore involve discussions around minimising such disruption. Given the general industrial and commercial nature of the area, further significant impacts on the local community appeared likely to be minimal.

2.4.94 **Property:** The site was considered **suitable** for use as either a main tunnel drive or reception/intermediate site, at significant but acceptable cost. The advantages of the site were that it is a significant size, unoccupied at that time, and it lies in an area identified for regeneration. However, there were potential issues of Crown ownership which required further investigation and it was necessary to acquire access rights for jetties and for the overflow culvert, which added to the acquisition cost.

### S04WR: Open space, Grosvenor Road

2.4.95 The site S04WR is an area of open space known as Pimlico Gardens, located in the London Borough of Westminster.

2.4.96 The site was considered for use as a main tunnel reception/intermediate site.

2.4.97 **Engineering:** This site was considered **less suitable** for use as a main tunnel reception/intermediate site because it is narrow. In addition, two single-storey buildings would require demolition. It did, however, benefit from good road access.

- 2.4.98 **Planning:** The site was considered **less suitable** for use as a main tunnel reception/intermediate site. The site had a number of onsite and adjacent sensitive receptors, such as a public open amenity space, a conservation area, listed buildings and residential properties. The site area was compact and therefore offered very little flexibility in terms of the siting of construction works at a distance from these receptors, and might even have been too small for use if the approved planning application for redevelopment of the existing restaurant building was implemented. Mitigation, reduced hours of construction and the re-provision of lost onsite facilities might be required by the LPA. However, visual impacts from the loss of mature trees might be difficult to mitigate.
- 2.4.99 **Environment:** Overall, the site was considered **suitable** for use as a main tunnel reception/intermediate site.
- 2.4.100 Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, surface water, ecology and flood risk. The site was considered **less suitable** from the perspectives of built heritage, townscape, hydrogeology, air quality, noise and land quality.
- 2.4.101 **Socio-economic and community:** The site was considered **less suitable** for use as a main tunnel reception/intermediate site from a community impacts perspective. The proposed site is located in an area of open space (Pimlico Gardens) and on a community facility (Westminster Boating Base), and is adjacent to tennis courts. The use of the site would probably lead to loss of the gardens and boating base, which might have a relatively severe impact on local open space users and recreational river users. Mitigation might involve discussions around relocating these facilities.
- 2.4.102 The works and remaining permanent structure would likely disrupt use of the gardens and access to the river. Revenue from the use of the boating base and park for event hire and as a film location might be lost, at least temporarily, as a result of the works. Here, mitigation might involve sensitive discussions around suitable relocation and/or compensation.
- 2.4.103 In addition, the site would likely cause disruption to the residential development and gardens opposite, particularly the dwellings that overlook the park and river. Mitigation might involve discussions around project timescales, operating times, minimising noise, and view masking.
- 2.4.104 **Property:** The site was considered **suitable** for use as a main tunnel reception/intermediate site from a property perspective. The acquisition cost should be acceptable; however, a special parliamentary procedure might be needed to acquire it, which could cause unacceptable delays to the project. The construction site would probably take part of number 135 Grosvenor Road, which has planning permission for residential redevelopment. If possible, the construction site arrangement should be amended to avoid that property and a potentially significant compensation claim.

### S11WR: Foreshore, adjacent to Riverwalk House and Vauxhall Bridge

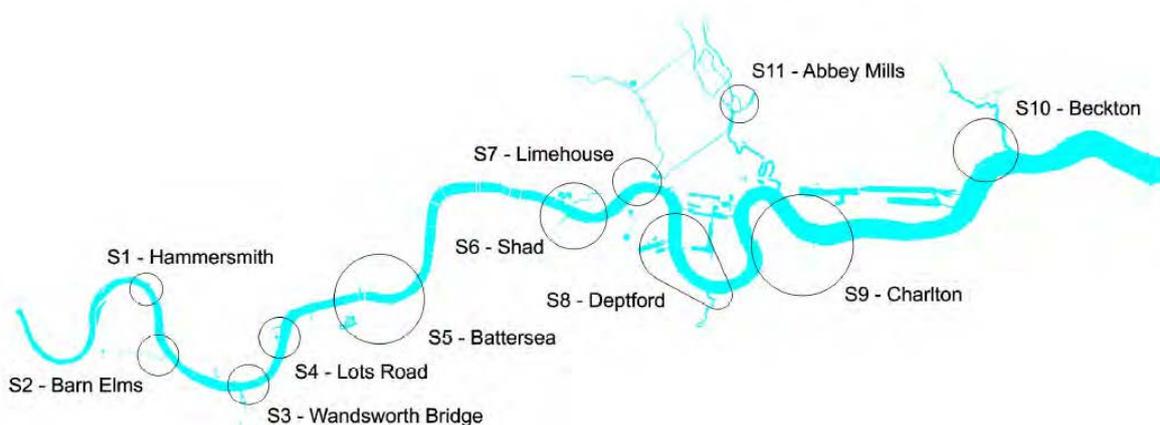
- 2.4.105 Site S11WR is located adjacent Vauxhall Bridge on the foreshore of the River Thames in the City of Westminster.
- 2.4.106 The site was considered for use as a main tunnel reception/intermediate site.
- 2.4.107 **Engineering:** The site was considered **less suitable** for use as a main tunnel reception/intermediate site because it is narrow and not conducive to an efficient working layout. It would also require extensive temporary works, including river protection, to create sufficient space for the construction phase.
- 2.4.108 **Planning:** The site was considered **less suitable** for use as a main tunnel reception/intermediate site. The site is subject to a number of onsite and adjacent designations and sensitive receptors, such as a conservation area and a nature conservation area of metropolitan importance, as well as residential and employment properties. Mitigation would be required to reduce visual, general amenity and setting impacts on these designations.
- 2.4.109 The site area is also compact and therefore offered very little flexibility in terms of siting the construction works at a distance from sensitive receptors, such as the adjacent office building. Mitigation and reduced hours of construction might also be required to avoid unacceptable adverse impacts on amenity.
- 2.4.110 **Environment:** Overall, the site was considered **less suitable** for use as a main tunnel reception/intermediate site. The site was considered **suitable** from the perspectives of transport, archaeology and noise but considered **less suitable** from the perspectives of built heritage, townscape, water resources (hydrogeology and surface water), ecology, air quality, land quality and flood risk.
- 2.4.111 **Socio-economic and community:** The site was considered **less suitable** for use as a main tunnel reception/intermediate site. Use of the site would likely severely impede the use of Riverside Walk Gardens during operations, disrupt the view of the river, and create cumulative noise impacts with Milbank Road. Mitigation might involve discussions around the time span of operations. Remnant structures in the foreshore would likely remain as visual clutter when seen from Riverside Walk Gardens.
- 2.4.112 Riverwalk House, which houses the Government Office for London, a PR company, Media Trust, and the Community Channel company, directly overlooks the proposed main works area of the site. Therefore, works would likely affect noise levels in the office block. Also, residential properties and a public house across the four-lane wide Milbank might experience limited noise disruption. Mitigation might involve discussions around operating times and minimising noise impacts.
- 2.4.113 **Property:** The site was considered **suitable** for use as a main tunnel reception/intermediate site. It is an undeveloped area of foreshore and the acquisition cost should be acceptable. However, a special ministerial procedure might be needed to acquire it, which could cause delays to the

project. Early discussions should be held with the PLA to establish whether it would agree to acquisition.

### 2.5 Phase one consultation preferred site

- 2.5.1 Consideration of the main tunnel sites up until short list stage focussed principally on each as an individual site in isolation from the assessment of tunnel drive and alignment options (ie, how the tunnel would be constructed and the route it would take). However, due to the nature of the project, it was necessary to select a package of main tunnel sites, having regard to how they would work in combination and in relation to the tunnel alignment and CSO connections.
- 2.5.2 The *Engineering options report* (Spring 2010) describes the process of identifying the tunnelling options, taking into account engineering requirements. The main points are summarised below.
- 2.5.3 The engineering team considered possible drive options – the combination of ways in which the tunnel could be constructed by ‘driving’ between combinations of shortlisted main tunnel sites – paying particular attention to changes in ground conditions and the requirement for different types of tunnelling machines, as well as construction risks and timescales.
- 2.5.4 To manage the total number of combinations of tunnel drive and reception/intermediate site options that together make up a ‘drive option’, the available shortlisted main tunnel sites were grouped together in zones. The zones were based on the geographical locations of the sites along the line of the River Thames and numbered and named for convenient referencing, as illustrated in Figure 2.1 below.

**Figure 2.1 Location of site zones**



- 2.5.5 Our preferred route for the main tunnel runs from west London to Abbey Mills Pumping Station and involves Zones S1 to S7 and Zone S11. Zones S8 to S10 were only required for the previously considered River Thames and Rotherhithe routes, which did not become our preferred option and are not considered further in this volume.

- 2.5.6 Multidisciplinary workshops were held to identify the most suitable main tunnel site from those shortlisted within each zone, taking into account the conclusions reached in the site suitability reports, as described above.
- 2.5.7 The distance between potential sites in Zone S5 and the next set of potential sites to the east (Zone S6 Shad) is such that a main tunnel site is required in Zone S5 to ensure that the maximum recommended tunnelling distances are not exceeded. There is also a change in geology at Zone S5, which means that it would be highly desirable to have a main tunnel site in this location. The drive options for the central section of the tunnel were also constrained by the fact that the only potentially available main tunnel sites identified in Zones S6 to S7 were assessed as suitable solely as main tunnel reception/intermediate sites. This meant that either a main tunnel drive site or main tunnel double drive site (ie, where the main tunnel is driven in two directions from one site) needed to be identified in Zone S5. Therefore, at this stage all the sites in Zone S5 that were identified as only suitable for main tunnel reception/intermediate sites were discounted.
- 2.5.8 The next decision was whether to use a site in Zone S5 as a double drive site (to drive the tunnel in both an easterly and westerly direction from one site) or, alternatively, to use the site as a single drive site to drive the main tunnel in one direction only and receive the main tunnel from the other.
- 2.5.9 As a consequence, the following two site options were identified as the preferred sites for Zone S5 from which to construct the central sections of the main tunnel:
- a. Option 1: S79WH with S80WH: Tideway Walk (suitable for use as a main tunnel drive site)
  - b. Option 2: S79WH with S80WH with S72WH, S73WH and S74WH: Tideway Walk (suitable for use as a double main tunnel drive site).
- 2.5.10 A series of comparisons were then made to determine how best to use the potential sites identified across all the zones to construct the main tunnel.
- 2.5.11 At a multidisciplinary workshop **S79WH with S80WH: Tideway Walk** was selected as our phase one consultation preferred main tunnel site from which to construct the central sections of the main tunnel. The reasons are summarised below (not in order of importance):
- a. S79WH and S80WH offered the opportunity to combine the requirements of the main tunnel drive works with the CS16X Heathwall Pumping Station interception and the CS17X South West Storm Relief interception, thereby minimising the CSO works into one site.
  - b. The other drive site possibilities (including S61WH: Battersea Park and S68WH: Battersea Power Station) are further from the Heathwall Pumping Station and South West Storm Relief sewers, which would therefore increase the scope of works required to connect these CSOs to the main tunnel.
  - c. The preferred site is close to the river, which would minimise the main tunnel alignment deviation from the centre of the river and reduce potential third-party impacts.

- d. The access and road transport to the preferred site was very good. Access to the river was a little more restricted but possible. It would require the installation of jetties to the eastern end, which would need to be designed to minimise the impact on both Middle Wharf and RMC Battersea Wharf. These areas are safeguarded wharves.
- e. The shaft sites S72WH, S73WH, S74WH, S79WH and S80WH are all clustered together in an area of industrial character consisting of warehouse buildings, depots and office accommodation.
- f. The five sites (S72WH, S73WH, S74WH, S79WH and S80WH) covered an area of approximately 35,000m<sup>2</sup>. The combined sites were considered suitable from the perspectives of engineering, planning and environment, but less suitable from a property and community perspective. The combined sites fall within a number of designated areas of the *Wandsworth Unitary Development Plan*, including the Nine Elms Opportunity Area, an archaeological priority area, the Thames Policy Area and a safeguarded wharf. The closest sensitive receptors were two moorings on the immediate river frontage of site S79WH, currently in use by a small residential boating community. There are a number of existing jetty facilities along the river foreshore associated with the combined sites. There is road access from Kirtling Street and Cringle Street, which is a short distance from the A3205 (Nine Elms Lane).
- g. It was considered that the constraints identified in relation to sites S72WH, S73WH, S74WH, S79WH and S80WH could be addressed with appropriate mitigation measures and that there would be no substantive conflict with planning policy. However, serious concerns remained in terms of property and acquisition costs for these sites, the proposed developments that might commence and the likely multiple land ownership and rights. This concern existed to a lesser or greater extent for all the sites considered, although the land acquisition concerns differed for S61WH: Battersea Park, which was least favourable in view of planning, environmental and community considerations.

2.5.12 Table 2.1 below sets out the preferred site and use.

**Table 2.1 Preferred site and use for phase one consultation**

**Site:** S79WH with S80WH: Tideway Walk

**Use:** To drive the central section of the main tunnel to King's Stairs Gardens and receive the main tunnel driven from Barn Elms (S17RD). The site would also be used to intercept and connect the Heathwall Pumping Station and South East Storm Relief CSOs to the main tunnel

2.5.13 We also confirmed at the same time and by following the same time process:

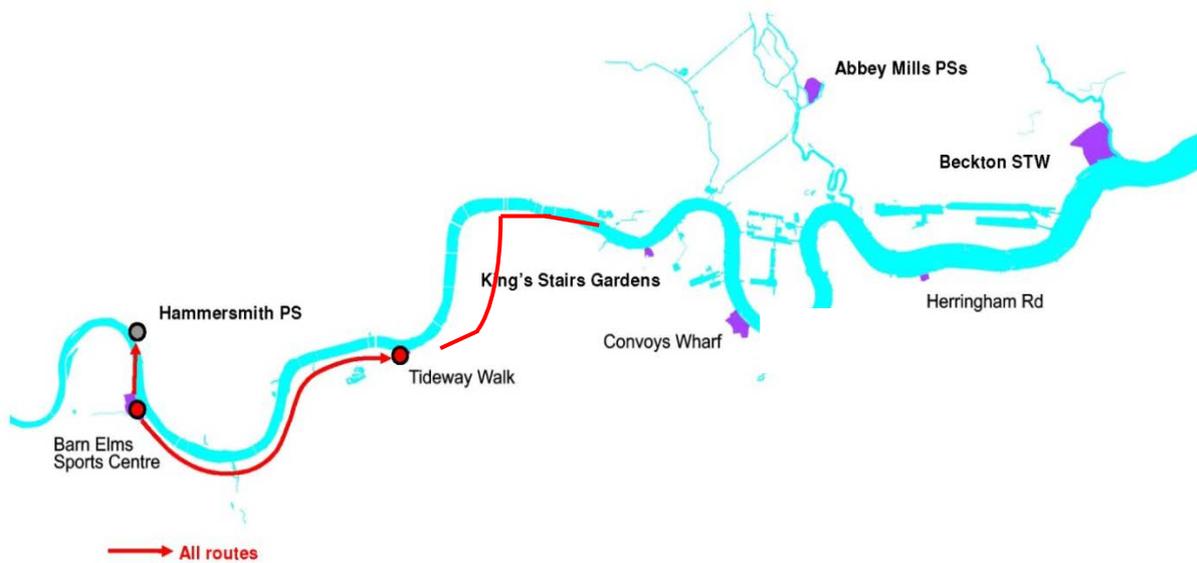
- a. S17RD: Barn Elms Sports Centre in Zone S2 as a preferred main tunnel drive/CSO site (see Volume 5) - this site would be used to drive the main tunnel westwards to Hammersmith Pumping Station in Zone

S1, drive the main tunnel eastwards to Tideway Walk in Zone S5 and intercept the West Putney Storm Relief CSO

- b. S54SK: King's Stairs Gardens in Zone S6 as a preferred reception/intermediate site (see Volume 18) - this site would be used to receive the main tunnel driven from Tideway Walk, receive the eastern section of the main tunnel driven from Abbey Mills Pumping Station in Zone S11 and also to drive a connection tunnel to connect the Druid Street, Earl Pumping Station, Deptford Storm Relief, and Greenwich Pumping Station CSOs to the main tunnel.

2.5.14 Figure 2.2 sets out the preferred phase one consultation drive strategy for the western and central sections of the main tunnel.

**Figure 2.2 Phase one consultation main tunnel drive strategy**



2.5.15 A more detailed discussion of the tunnelling options and comparisons for the main tunnel sites for all routes at this stage of the pre-application process are presented in Volume 1, Section 4.

## 3 Phase two consultation preferred main tunnel site: Scheme development and site selection process

### 3.1 Introduction

3.1.1 This section explains how we implemented the *Site selection methodology paper* in order to arrive at the preferred main tunnel site for the central sections of the tunnel route for phase two consultation. This stage took place from Winter 2010 to Autumn 2011.

3.1.2 Following phase one consultation and prior to phase two consultation, the site selection process comprised:

- a. a review of comments from phase one consultation
- b. consideration of any ongoing scheme design and/or any new information received
- c. a back-check exercise to review the sites listed in Section 2 along with any potential new sites or a combination of sites
- d. application of the assessment process outlined in 2.1.2, including the preparation of a new Engineering options report – Abbey Mills route (Summer 2011) with revised tunnelling drive options
- e. a multidisciplinary optioneering workshop to consider the detailed contents of the site suitability report for each shortlisted site and the Engineering options report – Abbey Mills route (Summer 2011)
- f. comparison of sites to identify the preferred main tunnel site and use (drive or reception/intermediate) for phase two consultation (also see Volume 1, Section 6 for the pre-phase two consultation discussion of tunnelling drive options).

3.1.3 The assessments described in this section were based on the information available at the time and the related stage in the pre-application process.

### 3.2 Summary of phase one consultation feedback

3.2.1 Details of the consultation comments related to our proposed use of the Tideway Walk site and our responses are provided in the *Report on phase one consultation*. The main concerns raised relevant to site selection can be summarised as follows:

- a. impact on boat moorings and community severance
- b. impact on residential amenity
- c. impact on the planned regeneration of the area
- d. design of the permanent proposals for the site
- e. impact on Cringle Dock Wharf.

- 3.2.2 The main comments received in support of the phase one consultation preferred site included:
- a. it is a brownfield site in an industrial area
  - b. it would have less impact on the existing heritage than the alternatives
  - c. it has good transport infrastructure and would allow transport of material by barge
  - d. it would have reduced impact on residential amenity compared to the alternatives
  - e. the proposals for the site following construction are considered acceptable.

## 3.3 Back-check process

- 3.3.1 During phase one our site monitoring discovered that our preferred main tunnel site at Tideway Walk was no longer available for use. Site S79WH had planning permission for a residential development and demolition work had started on site. We therefore needed to find an alternative site<sup>1</sup> and to review our drive options for Zone S5.
- 3.3.2 In response to the change of circumstances of the Tideway Walk site, feedback we received during phase one consultation, a number of engineering design developments and the availability of new technical information, we undertook a back-check to review our selection of S79WH with S80WH: Tideway Walk as our preferred site.
- 3.3.3 The back-check involved a targeted repeat of each relevant stage of our site selection process (as set out in the *Site selection methodology paper*) to reconsider which site would be the most suitable main tunnel drive site in Zone S5 for the construction of the central sections of the main tunnel.
- 3.3.4 As already noted, it was desirable to have a main tunnel drive site in this zone. The need to identify a new main tunnel drive site in this zone and others in Zones S0<sup>2</sup> to S4 and S6 to S7 also provided an opportunity to review the tunnelling strategy for the central sections of the tunnel.

### Engineering assumptions

- 3.3.5 As part of the back-check process, the engineering assumptions from the initial phase of site selection were reviewed to see if any of the design developments or new technical information altered the original assumptions.

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<sup>1</sup> It should be noted that S80WH is the same site area as our phase two consultation site C16XB to intercept Heathwall Pumping Station CSO and South East Storm Relief CSO (see this volume, appendix M for details). At the SSR stage, described later in this section, we only consider S80WH with S86WH and S94WH to provide both these potential sites with access to the River Thames.

<sup>2</sup> The creation of a new zone (S0) at the western end of the main tunnel is covered in detail Section 6 of the Main Report (Volume 1)

3.3.6 The outcome of this review was that the size of construction site required for a main tunnel drive shaft in Zones S0 to S4 (which covered the majority of the section of the tunnel that must be constructed predominantly in London Clay) was reduced from 18,000m<sup>2</sup> to 15,000m<sup>2</sup>. This change allowed the back-check process to review sites that were previously considered too small for main tunnel drive sites. At the same time, the size of site required for a double drive site (ie, tunnelling in two directions simultaneously from one shaft) was adjusted to 20,000m<sup>2</sup> (see Section 4.4 of the *Site selection background technical paper* (Summer 2011)).

3.3.7 The following section outlines the results of each stage of the back-check process.

#### Assessment of the back-check long list

3.3.8 The original long list of main tunnel sites in Zone S5 comprised 157 sites. These sites were reviewed alongside any newly identified sites to determine the 'scope' of the back-checking exercise (ie, which sites would be reassessed as a result of the relevant changes of circumstances or new information that had emerged). The scoping exercise found that we needed to reassess the following seven sites:

- a. S61WH: Battersea Park
- b. S68WH: Battersea Power Station
- c. S72WH: Cringle Street
- d. S86WH: Post Office, Nine Elms Lane
- e. S03WR: Foreshore, Grosvenor Road
- f. S04WR: Open space, Grosvenor Road
- g. S11WR: Foreshore, adjacent to Riverwalk House and Vauxhall Bridge.

3.3.9 In addition, the following four new sites were also added to the back-check long list:

- a. S92WH: Part of Battersea Power Station (previously part of S68WH and S69WH)
- b. S93WH: Kirtling Street (previously S73WH with S74WH and S75WH)
- c. S94WH: Post Office Way (previously S87WH and part of S88WH)
- d. S95WH: Depots, Ponton Road (previously part of S89WH and all of S90WH).

3.3.10 All the other sites on the original long list were scoped out as there had been no change in circumstances to necessitate a reappraisal. The potential group of sites listed above was put on the back-check long list. It should be noted that at this stage, we also considered alternative sites suggested by consultees. However, besides the sites listed above, none were judged to be feasible, mainly due to size and/or location.

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- 3.3.11 Sites S69WH, S73WH, S74WH, S75WH, S87WH, S88WH, S89WH and S90WH were withdrawn as they were replaced by the new sites, as detailed above.
- 3.3.12 The back-check long list sites were then assessed against the high-level considerations set out in SSMP Table 2.2 which included engineering (site size, site features, availability of a jetty/wharf and access), planning and environment (heritage, landscape/townscape, open space and ecology) and community and property (neighbouring land uses, site use, Special Land/Crown land and acquisition costs) considerations.
- 3.3.13 Table 3.1 below provides a summary of the outcome of the back-check assessment of the back-check long list of sites. Sites that were determined to be the least constrained in light of the SSMP Table 2.2 considerations passed to the draft short list. This did not necessarily mean that these sites were ultimately judged suitable, but rather that no significant constraints were identified in relation to the high-level considerations set out in SSMP Table 2.2. Sites that were judged to be more constrained were not retained on the draft short list for more detailed assessment. The main rationale for excluding these sites at this stage is summarised below in Table 3.1.

**Table 3.1 Long list to draft short list for main tunnel sites in Zone S5 (SSMP Table 2.2 assessment)**

Site ID	Site name/description	Recommendation
S61WH	Battersea Park	<b>Recommendation:</b> To draft short list as a main tunnel drive site and main tunnel reception/intermediate site.
S68WH	Battersea Power Station	<b>Recommendation:</b> To draft short list as a main tunnel drive site and main tunnel reception/intermediate site.
S72WH	Cringle Street	<b>Recommendation:</b> To draft short list as a split main tunnel drive site and reception/intermediate site with S93WH. Also to consider as a reception/intermediate site on its own.
S86WH	Post Office, Nine Elms Lane	<b>Recommendation:</b> To draft short list as a split main tunnel drive site with S80WH and a main tunnel reception/intermediate site.
S92WH	Part of Battersea Power Station	<b>Recommendation:</b> To draft short list as a main tunnel drive site and main tunnel reception/intermediate site.
S93WH	Kirtling Street	<b>Recommendation:</b> To draft short list as a main tunnel drive site and main tunnel reception/intermediate site.

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Site ID	Site name/description	Recommendation
S94WH	Post Office Way	<b>Recommendation:</b> To draft short list as a split main tunnel drive site with S80WH and a main tunnel reception/intermediate site.
S95WH	Depots, Ponton Road	<b>Recommendation:</b> To draft short list as a main tunnel drive site and main tunnel reception/intermediate site.
S03WR	Foreshore, Grosvenor Road	<b>Recommendation:</b> To draft short list as a main tunnel reception/intermediate site.
S04WR	Open space, Grosvenor Road	<b>Recommendation:</b> To draft short list as a main tunnel reception/intermediate site.
S11WR	Foreshore, adjacent to Riverwalk House and Vauxhall Bridge	<b>Recommendation:</b> To draft short list as a main tunnel reception/intermediate site.

NB. The site ID and site name/description were used as an internal mechanism to record and describe the site but could be updated as necessary.

3.3.14 All 11 sites on the long list were assessed as potentially suitable and passed to the draft short list. No sites were eliminated as unsuitable.

#### Assessment of the back-check draft short list sites

3.3.15 The 11 back-check draft shortlisted sites were further assessed by the engineering, planning, environment, community and property disciplines, having regard to the considerations set out in SSMP Table 2.3 which included: engineering (site size, distance and route to the river, jetty/wharf facilities, means of road/rail access, site features, site efficiency, tunnelling and systems engineering requirements); planning and environment (planning applications/permissions, London Plan/UDP/LDF allocations or special policy areas, heritage designations, landscape/open space designations, ecological designation, transport and amenity); property (ownership of site, tenant on site, estimated acquisition cost, Crown land and special land, access and material transfer rights) and community (proximity to sensitive receptors, social, economic, health and equality considerations).

3.3.16 Table 3.2 below summarises the outcome of the SSMP Table 2.3 back-check assessment of the draft short list of sites. Sites that were assessed as being the least constrained in light of the SSMP Table 2.3 considerations were retained on the short list and passed to the next stage of assessment. This did not necessarily mean that a site was ultimately judged suitable, but rather that no significant constraints were identified in relation to the considerations set out at SSMP Table 2.3. Sites that were judged to be more constrained were not retained on the short list for more detailed assessment. The decision of whether or not to retain a site on the

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short list was taken at a multidisciplinary workshop. The main rationale for excluding sites at this stage is summarised below in Table 3.2.

**Table 3.2 Draft short list to final short list for main tunnel sites in Zones S1 to S4 (SSMP Table 2.3 assessment)**

Site ID	Site name/description	Recommendation and rationale
S61WH	Battersea Park	<b>Recommendation:</b> Retain on short list as a main tunnel drive site and main tunnel reception/intermediate site.
S68WH	Battersea Power Station	<b>Recommendation:</b> Retain on short list as a main tunnel drive site and main tunnel reception/intermediate site.
S72WH	Cringle Street	<b>Recommendation:</b> Retain on short list as a split main tunnel drive site and reception/intermediate site with S93WH. Also consider as a reception/intermediate site on its own.
S86WH	Post Office, Nine Elms Lane	<b>Recommendation:</b> Retain on short list as a split main tunnel drive site with S80WH and a main tunnel reception/intermediate site.
S92WH	Part of Battersea Power Station	<b>Recommendation:</b> Retain on short list as a main tunnel drive site and main tunnel reception/intermediate site.
S93WH	Kirtling Street	<b>Recommendation:</b> Retain on short list as a main tunnel drive site and main tunnel reception/intermediate site.
S94WH	Post Office Way	<b>Recommendation:</b> Retain on short list as a split main tunnel drive site with S80WH and a main tunnel reception/intermediate site.
S95WH	Depots, Ponton Road	<b>Recommendation:</b> Retain on short list as a main tunnel drive site and main tunnel reception/intermediate site.
S03WR	Foreshore, Grosvenor Road	<b>Recommendation:</b> Not to short list for consideration as a main tunnel drive site or a main tunnel reception/intermediate site. <b>Rationale:</b> <ul style="list-style-type: none"> <li>• Engineering: Further investigation showed that the location of the EDF cable that passes through the site would constrain the use of this site.</li> <li>• Property: The multiple leases might make acquisition complex. There is also</li> </ul>

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Site ID	Site name/description	Recommendation and rationale
		<p>potential for a high discretionary purchase cost.</p> <ul style="list-style-type: none"> <li>Community: There is a significant number of sensitive receptors in close proximity to the site including residents, a nursery school and a recreation area.</li> </ul>
S04WR	Open space, Grosvenor Road	<p><b>Recommendation:</b> Not to short list for consideration as a main tunnel drive site or a main tunnel reception/intermediate site.</p> <p><b>Rationale:</b></p> <ul style="list-style-type: none"> <li>Engineering: Further investigation showed that the location of the EDF cable that passes through the site would constrain the use of this site.</li> <li>Property: The site has multiple owners and residents also have shared ownership of the adjoining tennis courts, so acquisition might be complex. Also the discretionary purchase cost was likely to be high.</li> <li>Community: There is a significant number of sensitive receptors in close proximity to the site including community gardens, tennis courts and a boat club.</li> </ul>
S11WR	Foreshore, adjacent to Riverwalk House and Vauxhall Bridge	<p><b>Recommendation:</b> Not to short list for consideration as a main tunnel drive site or a main tunnel reception/intermediate site.</p> <p><b>Rationale:</b></p> <ul style="list-style-type: none"> <li>Engineering: Further investigation showed that the access arrangement would be very constrained.</li> <li>Community: There was a limited amount of sensitive receptors, but it might affect the adjacent Riverwalk House and small area of open space. However, if the site needed to be moved further north, it might have more impact on the Chelsea Collage of Art and Design and the Tate Britain gallery.</li> </ul>

NB. The site ID and site name/description were used as an internal mechanism to record and describe the site but could be updated as necessary.

3.3.17 Of the 11 sites on the back-check short list, eight were assessed as potentially suitable and passed to the back-check final short list and three sites did not proceed to the back-check final short list.

### Assessment of the back-check final short list sites

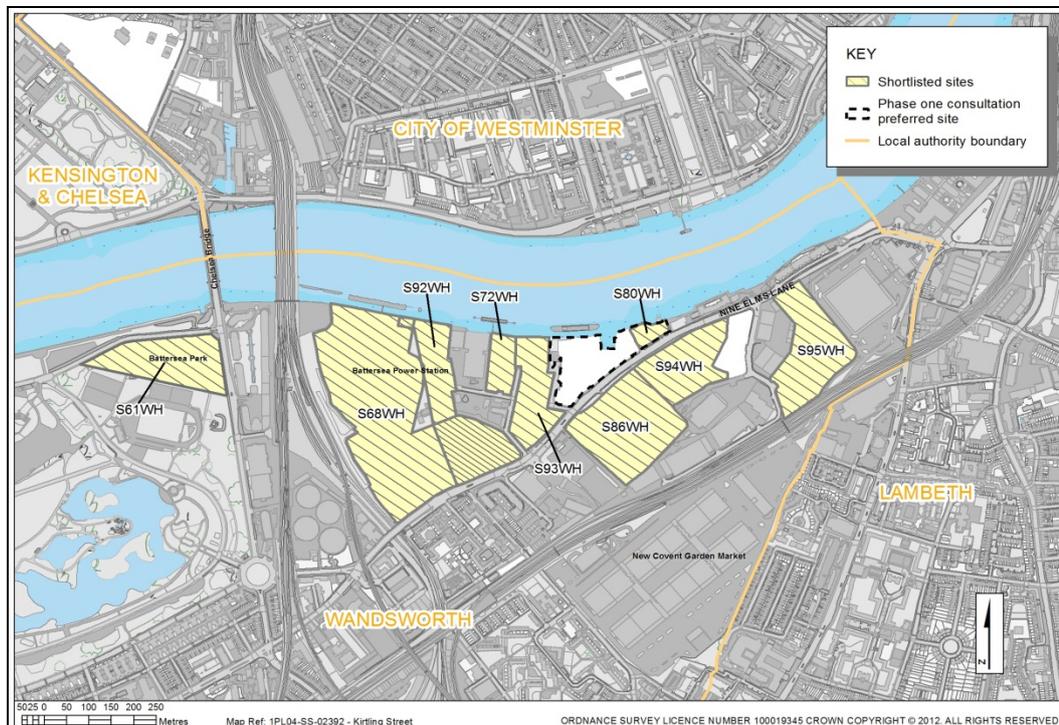
3.3.18 Following the back-check, the eight final shortlisted sites identified for assessment at the next stage were as follows:

Sites identified as suitable for main tunnel drive or reception/intermediate sites:

- a. S61WH: Battersea Park
- b. S68WH: Battersea Power Station
- c. S72WHS93WH: Kirtling Street (with Cringle Street) – split main tunnel drive site
- d. S86WH/S80WH: Post Office, Nine Elms Lane – split main tunnel drive site
- e. S92WH: Part of Battersea Power Station
- f. S93WH: Kirtling Street
- g. S94WH/S80WH: Post Office Way – split main tunnel drive site
- h. S95WH: Depots, Ponton Road.

3.3.19 Figure 3.1 shows the location of all the shortlisted sites in Zone S5 that could potentially be used in tunnelling strategies for the construction of the central section of the main tunnel.

**Figure 3.1 Location of main tunnel shortlisted sites in Zone S5**



3.3.20 A site suitability report was prepared for the new back-check final short list sites and the site suitability reports for the phase one shortlisted sites were re-evaluated. The size of site required was reduced in line with the revised engineering assumptions for main tunnel drive sites constructed in clay.

3.3.21 These site suitability reports contain an assessment of each site's suitability in the light of engineering, planning, environment, community and property considerations. At this stage in the process, no comparisons were drawn between sites; they were assessed in isolation and with no regard to tunnelling strategy. Sites were evaluated by each discipline using our teams' technical knowledge and professional judgement as appropriate, and assessed as suitable, less suitable or not suitable from that discipline's perspective.

3.3.22 A summary of the conclusions of each discipline's assessment from the site suitability reports is provided below.

### **S61WH: Battersea Park**

3.3.23 Site S61WH is located in Battersea Park, a Grade II\* registered park and garden which contains woodland, grassed areas, a lake, gardens and a diverse range of community facilities and public amenities. The site is bounded to the north by the River Thames, to the east by Queenstown Road and Chelsea Bridge, to the west by Albert Bridge Road and to the south by Prince of Wales Drive. The site is located in the London Borough of Wandsworth.

3.3.24 The following potential main tunnel site uses were re-assessed: double drive site (ie driving the tunnel in two directions from this site), single drive site and reception/intermediate site.

3.3.25 The phase one site suitability report was reviewed by all disciplines and this result in slight changes as specified below, but these did not materially alter the overall assessment.

3.3.26 **Engineering:** The site was considered **suitable** for use as a main tunnel double drive, single drive or reception/intermediate site at phase one, and these recommendations remained unchanged. This was predominantly due to the good site size, river and road access. Also, the locations of the proposed shafts would be sufficiently far away from major third-party assets such as the Crossrail Line 2 Safeguarded Zone, Albert Bridge and Chelsea Bridge to avoid impacting on them.

3.3.27 **Planning:** The site was considered **not suitable** for use as a main tunnel double drive or single drive site at phase one. This was predominantly due to the scale of proposed works and the land-take required, which was considered too great for this sensitive location, which is subject to a number of policy designations. The conflict with planning policies, including those relating to heritage conservation, Metropolitan Open Land and public open space, would very likely be unacceptable, particularly given the scale, longevity and prominence of both the construction works and after-structures.

3.3.28 The site was considered **less suitable** for use as a main tunnel reception/intermediate site at phase one due to the reduced scale of construction activity and permanent land-take. Significant mitigation would, however, be required.

3.3.29 While a number of development plan documents have been adopted since the site suitability report was completed, the updated policies do not

impact on the final planning assessments so both recommendations remained unchanged.

- 3.3.30 **Environment:** Overall, the site was considered **less suitable** for use as all types of site at phase one and these recommendations remained unchanged. The site was considered **suitable** from the perspectives of transport, archaeology, water resources, flood risk, air quality, noise and land quality. However, the site was considered **less suitable** from the perspectives of built heritage, townscape and ecology.
- 3.3.31 **Socio-economic and community:** The site was considered **not suitable** for use as a main tunnel double drive site at phase one due to the likely cumulative community impacts. The areas of the park directly affected by the proposed double drive main tunnel site were likely to be valued by the community as an area of open space. Based on its current use, Chelsea Bridge Fields appears to be a unique open space within Battersea Park, due to its elevation and tree cover. The riverside edge of Festival Pleasure Gardens offers views across the river and over the park and is therefore likely to be popular.
- 3.3.32 The site was considered **less suitable** for use as a main tunnel drive or reception/intermediate site at phase one. As with the main tunnel double drive site, it appears that the area of the park proposed for use as a main tunnel drive or reception/intermediate site is valued by the community as an area of open space.
- 3.3.33 It was noted during the re-assessment that it was likely there would be an impact on neighbouring residential properties that was not included in the previous assessment. However, the socio-economic and community recommendations remained unchanged.
- 3.3.34 **Property:** The site was considered **suitable** for use as a main tunnel single drive or reception/intermediate site at phase one. The level of risk would increase with the land area required and the impact on the park's amenities. The area required for a main tunnel double drive site was considered to be unacceptably large in this context, and the site was therefore considered **not suitable** for this use at phase one.
- 3.3.35 Site acquisition costs were likely to be very high if replacement land were required. The property assessment was **less suitable** as a main tunnel double or single drive site due to the high acquisition costs associated with providing replacement land. Acquisition costs were likely to be acceptable for a reception/intermediate site. The property assessment therefore remained **suitable**.

### **S68WH: Battersea Power Station**

- 3.3.36 Site 68WH is occupied by the disused Grade II\* listed Battersea Power Station. The site is located in the London Borough of Wandsworth.
- 3.3.37 The following potential main tunnel site uses were re-assessed: main tunnel drive and reception/intermediate site.

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- 3.3.38 The phase one site suitability report was reviewed by all disciplines and this result in slight changes as specified below, but these did not materially alter the overall thrust of our assessment.
- 3.3.39 **Engineering:** The site was considered **less suitable** for use as either a main tunnel drive site or a reception/intermediate site at phase one and these recommendations remained unchanged. The presence of Battersea Power Station would restrict site traffic and the length of river frontage available was insufficient to accommodate the jetties necessary for a main tunnel drive site. For both site types, there were also potential problems with contaminated land and numerous underground structures that would impact on the shaft location, which might require enabling works and protection measures. It is also possible that there are other underground structures associated with the power station in addition to those currently identified.
- 3.3.40 **Planning:** The site was considered **less suitable** for use as a main tunnel drive site at phase one as construction would require significant land-take across the site and a substantial amount of construction activity both on-site and in the river. This level of construction activity would reduce the potential to redevelop the site in parallel with other uses, which could cause delay or even hinder the potential regeneration of such a prominent site. Potential impacts on the appearance and setting of the Grade II\* Battersea Power Station listed building would likely require significant mitigation and the level of disruption might be unacceptable.
- 3.3.41 The site was considered **suitable** for use as a main tunnel reception/site at phase one, due to the smaller site size required, it might be possible to implement regeneration proposals alongside the use of the site for the project.
- 3.3.42 For both scenarios, the design, permanent access and particularly visual impact of the remaining after-use structures would also require further consideration in relation to the Grade II\* listed power station and future regeneration plans.
- 3.3.43 While a number of development plan documents have been adopted since the site suitability report was completed, the updated policies would not have an impact on the planning assessments so both recommendations remained unchanged.
- 3.3.44 **Environment:** Overall, the site was considered **suitable** for use as both a main tunnel drive or reception/intermediate site at phase one, and these recommendations remained unchanged.
- 3.3.45 Based on the information available at the time, the sites were considered **suitable** from the perspectives of transport, archaeology, water resources, flood risk, air quality, and noise. The sites were considered **less suitable** from the perspective of built heritage, townscape, ecology and land quality.
- 3.3.46 **Socio-economic and community:** The site was considered **suitable** for use as a main tunnel drive or reception/intermediate site at phase one as it appeared that use of the site would be unlikely to have a significant impact

on the local community due to the existing industrial and commercial land uses around the site.

- 3.3.47 Industrial and commercial properties in the vicinity of the site appeared most likely to be impacted by the proposed use of the site. Of these premises, it appeared that the adjacent Cringle Dock Refuse Transfer Station to the east, which is used by residents of the borough, would be most likely to be affected.
- 3.3.48 It was noted during the re-assessment that it was likely there would be an impact on neighbouring residential properties that was not included in the previous assessment. However, the socio-economic and community recommendations remained unchanged.
- 3.3.49 **Property:** This site was considered **not suitable** for use as a main tunnel drive or reception/intermediate site at phase one due to significant acquisition costs
- 3.3.50 This site was considered **less suitable** as a main tunnel drive site and reception/intermediate site. The site appeared to be in private ownership and therefore presented no significant procedural difficulty in acquiring the land using compulsory purchase powers. However, the site would command residential development value and the acquisition cost would be very high. If development commenced, the site might no longer be available for acquisition, which would represent a significant risk to the project.
- 3.3.51 It was important that any use of the worksite did not prejudice the wider redevelopment of the Battersea Power Station site. If development was prejudiced, any acquisition might be opposed by the London Borough of Wandsworth, the GLA and Treasury Holdings. This would create a significant acquisition risk.
- 3.3.52 There was also a risk that the acquisition cost could be significantly higher than currently estimated if noise and dust from works prevented development of the rest of the Battersea Power Station site.

### **S72WH/S93WH: Kirtling Street (with Cringle Street)**

- 3.3.53 Site S72WH is situated on land currently used as a materials ready-mix concrete depot. S72WH is relatively flat and rectangular in shape. The depot site connects to an existing jetty by means of an overhead conveyor structure. The majority of the site consists of outdoor storage areas for aggregates for use as part of a ready-mix operation.
- 3.3.54 S93WH is situated across three parcels of land currently occupied by industrial warehousing, a depot, a former petrol filling station and office buildings in the Nine Elms Industrial Area of the London Borough of Wandsworth. Kirtling Street and Cringle Street run through and around the construction site. The site is bounded by the River Thames to north.
- 3.3.55 This site was assessed for use as either a main tunnel double or single drive site or a reception/intermediate site.
- 3.3.56 **Engineering:** The combined site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site

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because the site is a suitable size, located on the riverside and in a good location for the tunnel alignment. Furthermore, the shaft and jetty are located some distance from the houseboats at Nine Elms Pier and from the Riverlight development on the Tideway Walk site. The combined site is also large enough to accommodate the ready-mix concrete operator and for them to use the existing Cringle Wharf jetty.

- 3.3.57 **Planning:** The combined site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site, provided that sufficient mitigation measures are employed to avoid unacceptable impacts on planning designations. Although part of site S93WH is within the planning application boundary to redevelop the Battersea Power Station, this area would be required for the latter phases of the approved proposals, which were likely to be compatible with our construction timetable.
- 3.3.58 The site could be used either with or without the aggregates facility in accordance with its designation as a safeguarded wharf. Further consultation with the operator of the aggregates wharf might be required in order to avoid a conflict in operations and barge movements with the joint use of the jetty facility. Proposals for use of the jetty would also need to ensure that the works would not negatively impact operations of the adjacent Waste Transfer Station to the west.
- 3.3.59 The increase in tunnelling activity and transport movements associated with a double drive would result in a higher level of noise, dust, lighting and more traffic movement, with potentially twice as many transport movements as a single drive site. However, due to the location of the site in a wider industrial area designated for substantial future regeneration, the surrounding receptors would likely experience disruption from the associated construction activity in any case. However, the cumulative impacts of increased vehicle movements would need to be considered with the redevelopment proposals that come forward in the surrounding area in order to ensure that wider cumulative impacts would not be experienced.
- 3.3.60 **Environment:** Overall, the combined site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site.
- 3.3.61 Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage, townscape, water resources (surface water), and flood risk.
- 3.3.62 This site was considered **less suitable** from the perspectives of water resources (hydrogeology), ecology, air quality, noise and land quality.
- 3.3.63 **Socio-economic and community:** The combined site was considered **less suitable** for use as a main tunnel double or single drive site because its use would likely affect a residential boat community moored to the east of the site. The effects would be greatest if the site were used as a double drive site due to the 24-hour working, the scale of work and the location of the extended jetty facilities. The disruption caused by the use of jetties was likely to be reduced if we could utilise the whole of site S72WH.

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- 3.3.64 The site was considered **suitable** for use as a reception/intermediate site as this option appeared likely to cause less disruption to the boat community. Even though 24-hour working was still proposed, the scale of work would be vastly reduced when compared to the other options and it appeared more likely that the impacts could be mitigated.
- 3.3.65 **Property:** The combined site was considered **less suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. The site is in private ownership, therefore there would be no significant procedural difficulties in acquiring the land using compulsory purchase powers. Furthermore, the site includes a protected wharf which would prevent higher value uses, resulting in lower acquisition costs for that part of the site. However, the majority of the site would command residential development value. This would result in high acquisition costs. Also, if development commenced, the site might no longer be available, which would represent a risk to the project.
- 3.3.66 If the site were shared with the current wharf user, disturbance costs were likely to be lower as the business could continue to operate, but this would not make a significant difference to the overall acquisition cost. Therefore, the assessment remained suitable for all site options.

#### **S86WH: Post Office, Nine Elms Lane**

- 3.3.67 Site S86WH is currently occupied by the Royal Mail Sorting Office depot. The proposed site fronts onto Nine Elms Lane and is bounded to the west, south and east by industrial uses, such as warehouses and depots, as well as the New Covent Garden Market. The site is situated in the Vauxhall Nine Elms Battersea Opportunity Area in the London Borough of Wandsworth.
- 3.3.68 The site was assessed for use as a main tunnel double or single drive site or a reception/intermediate site.
- 3.3.69 **Engineering:** The site was considered **less suitable** for use as a main tunnel double or single drive site or reception/intermediate site because of the likelihood of highly contaminated ground on site. The distance from the river would require the main tunnel to deviate significantly from the river and pass south of Battersea Power Station under the redevelopment site and a number of critical service tunnels along Nine Elms Lane. The provision of jetty facilities would be difficult, with a number of constraints, and the need for overhead conveyors to transport the excavated materials over Nine Elms Lane via site S80WH.
- 3.3.70 **Planning:** The site was considered **less suitable** for use as a main tunnel single main drive or reception/intermediate site. Use of the proposed site would likely have an unacceptable impact on the development potential of the surrounding area. As the main shaft would be located away from the River Thames, the tunnel alignment would have to divert further inland and potentially affect the feasibility of future high-density and high-rise development opportunities above the alignment.
- 3.3.71 The site was also considered **less suitable** for use as a main tunnel double drive site as it would increase tunnelling activity and transport

movements, and require use of overhead conveyors. This would likely result in increased levels of noise, dust, lighting and potentially twice as many transport/traffic movements.

- 3.3.72 **Environment:** Overall, the site was considered **less suitable** for use as a main tunnel double or single drive site or reception/intermediate site. This was primarily due to the high potential for ground contamination of the site as a result of the site's previous use as a gas works. Known contamination issues included heavy metals and the potential to encounter underground tanks on site and subterranean tar lagoons that were not mapped. Remediation costs would therefore likely be extensive.
- 3.3.73 Based on the information available at the time, the site was considered **suitable** for all site options from the perspectives of transport, archaeology, built heritage and townscape, flood risk and water resources (surface water). It was also **suitable** from the perspectives of ecology for the reception/intermediate site option.
- 3.3.74 The site was considered **less suitable** for all site options from the perspectives of water resources (hydrogeology), air quality, noise and land quality. It was also considered **less suitable** from the perspectives of ecology for the single or double main tunnel drive site.
- 3.3.75 **Socio-economic and community:** This site was considered **less suitable** for use as a main tunnel double or single drive site. This was predominantly because use of and access to the materials jetties associated with the site would likely involve some construction related disruption to Elm Quay residents and the boat community moored in the vicinity of the existing pumping station.
- 3.3.76 The site was considered **suitable** for use as a reception/intermediate site as it appeared unlikely that its use for this option would impact on the local community, especially in the context of the proposed redevelopment of the whole area.
- 3.3.77 **Property:** The site was considered **less suitable** for use as a main tunnel double or single drive site if the Royal Mail office were not operational. The site would likely command residential development value and the acquisition cost would be high. However, the site was considered **suitable** for use as a reception/intermediate site with acceptable acquisition costs.
- 3.3.78 If the site remained operational for Royal Mail purposes, it was considered **not suitable** on grounds of acquisition cost and risk for all three options. However, Royal Mail has development aspirations for the site and therefore it is unlikely that the operational use of the site will continue.

### S92WH: Part of Battersea Power Station

- 3.3.79 Site S92WH forms part of the area identified for the Battersea Power Station redevelopment scheme. It is irregular in shape, with a river frontage, and accessible via Cringle Street and Kirtling Street.
- 3.3.80 The site is occupied by an existing district heating plant which serves the north side of the river, as well as general purpose hardstanding for

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parking, loading/unloading and storage. The central area of the site also contains the Grade II listed Battersea Power Station and the southern section includes areas cleared for the power station redevelopment. The site is located in the Nine Elms area of the London Borough of Wandsworth.

- 3.3.81 The site was considered for use as a main tunnel double or single drive site or a reception/intermediate site.
- 3.3.82 **Engineering:** The site was considered **suitable** for use as a main tunnel single drive and reception/intermediate site but **less suitable** for use as a main tunnel double drive site because of the constrained site shape and because a double drive option would require a larger shaft and leave very limited access room around it. Although the site is located adjacent to the river, which is good for the tunnel alignment, it would require the relocation of the 'Dalkia' district heating boiler building (for Dolphin Square) prior to commencing works and is close to existing Thames Water shafts associated with clean water tunnels under the river, including the London Ring Main. Handling of materials by river barge would have to be at the existing Battersea Power Station jetty, which might not be available.
- 3.3.83 **Planning:** The site was considered **less suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. Following discussions with the applicant, there are proposals for the land forming S92WH to be the construction site for the approved Battersea Power Station redevelopment works and is critical to the implementation of the permission. It was therefore envisaged that the area proposed for the project would unlikely be temporarily used for a main tunnel site without delaying or preventing the redevelopment of a significant portion of the wider site or the listed power station itself.
- 3.3.84 For a main tunnel double drive site, there was also a potential conflict of barge movements, the use of the river, and the proximity to the existing Waste Transfer Station barge access.
- 3.3.85 **Environment:** Overall, the site was considered **less suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. The site was considered **suitable** from the perspectives of transport, archaeology, surface water, hydrogeology, flood risk and noise. In the case of the reception/intermediate option, the site was also considered suitable from the perspectives of ecology. The site was considered **less suitable** from the perspectives of built heritage, townscape, air quality and land quality. In the case of the main tunnel double and single drive options, the site was also considered **less suitable** from the perspective of ecology.
- 3.3.86 **Socio-economic and community:** The site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. Based on the information available at the time of the assessment, it appeared that the use of the site would be unlikely to cause major levels of disruption to the local community. However, that would depend on the ability to relocate the district heating facility efficiently to minimise any break in service and ensure that construction works would be effectively

screened from residential properties opposite the eastern and southern edge of the site.

- 3.3.87 **Property:** This site was considered **less suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. The site appeared to be in private ownership and should therefore present no significant procedural difficulty in acquiring the land using compulsory purchase powers. However, the site would command residential development value and the acquisition cost would be very high. If development commenced, the site might no longer be available for acquisition, which would represent a significant risk to the project.
- 3.3.88 It was important that any use of the worksite would not prejudice the wider redevelopment of the Battersea Power Station site. If development were prejudiced, any acquisition might be opposed by the London Borough of Wandsworth, the GLA, and Treasury Holdings. This would create a significant acquisition risk.
- 3.3.89 There is also a risk that the acquisition cost could be significantly higher than currently estimated if noise and dust from works prevented development of the rest of the Battersea Power Station site.

### S93WH: Kirtling Street

- 3.3.90 Site S93WH is situated across three parcels of land currently occupied by an industrial warehousing, a depot, a former petrol filling station and office buildings. Kirtling Street and Cringle Street run through and around the construction site. The site is bound by the River Thames to the north.
- 3.3.91 The Cringle Street ready-mix concrete depot, an office building, Cringle Dock Waste Transfer Station and Thames Water Pumping Station are situated to the west of the site. The Tideway Industrial Estate, Nine Elms Lane and the Royal Mail Sorting Office are situated to the east. New Covent Garden Market and properties located along Battersea Park Road are located to the south of the site. The site is located in the Nine Elms Industrial Area of the London Borough of Wandsworth.
- 3.3.92 The site was considered for use as a main tunnel double or single drive site or a reception/intermediate site.
- 3.3.93 **Engineering:** This site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site because the site is a suitable size, is located on the riverside and would be acceptable for the tunnel alignment. The provision of jetty facilities would be difficult, as it would rely on using the area in front of the existing Nine Elms Pier and Cringle Wharf and/or using the pier itself, which would mean relocating a significant number, and possibly all, of the residential boats around Nine Elms Pier.
- 3.3.94 **Planning:** The combined site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site, provided that sufficient mitigation measures are employed to avoid unacceptable impacts on planning designations. While part of the site is within the planning application boundary to redevelop the Battersea Power Station,

this area forms the latter phases of the approved proposals, which were likely to be compatible with our construction timetable.

- 3.3.95 The use of jetties for a drive site would require a much higher standard of mitigation to avoid unacceptable effects on the amenity of the existing houseboats from 24-hour working, noise, dust, lighting and traffic movements. However, a number of houseboats might require temporary relocation.
- 3.3.96 The increase in tunnelling activity and transport movements associated with a double drive would result in higher levels of noise, dust, lighting and potentially twice as many transport movements as a single drive site. However, the fact that the site is located in a wider industrial area designated for substantial future regeneration, the surrounding receptors would likely experience disruption from the associated construction activity in any case.
- 3.3.97 **Environment:** Overall, the site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage, townscape, water resources (surface water), and flood risk. This site was considered **less suitable** from the perspectives of water resources (hydrogeology), ecology, air quality, and noise and land quality.
- 3.3.98 **Socio-economic and community:** The site was considered **less suitable** for use as a main tunnel double or single drive site or reception/intermediate site because any form of worksite in this location would likely require the relocation of the residential boat community moored in the vicinity of the site. The impacts would be greatest if the site were used as either a double or single drive site due to the requirement for 24-hour working and the proposed location of the jetties. While the reception/intermediate site option might cause less disruption and it is more likely that the impacts could be mitigated, a number of houseboats would still be in close proximity to the main shaft works area.
- 3.3.99 **Property:** This site was considered **less suitable** as a main tunnel double or single drive site or a reception/intermediate site primarily due to high acquisition costs. The site is in private ownership and therefore the freehold ownership should present no significant procedural difficulty in acquiring the land using compulsory purchase powers. However, the site would command residential development value and the acquisition cost would be high. Also, if development commenced, the site might no longer be available for acquisition, which would represent a risk to the project. The site is also part occupied by the Victoria and Albert Museum, which is a Crown interest that cannot be acquired by compulsory purchase; therefore acquisition would need to be by agreement.

### S94WH: Post Office Way

- 3.3.100 Site S94WH is situated within the site previously occupied by the publishers TSO. It is currently vacant and comprises a large complex that consists of a six-storey office block and several low-rise storage and distribution warehouses. The proposed site fronts onto Nine Elms Lane

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and is bounded to the west by the Post Office sorting depot, and the east by the proposed American Embassy site. The site is located in the Vauxhall Nine Elms Battersea Opportunity Area in the London Borough of Wandsworth

- 3.3.101 The site was considered for use only as a main tunnel single drive and reception/intermediate site as it is too small to accommodate the core and ancillary activities required for a main tunnel double drive site.
- 3.3.102 **Engineering:** This site was considered **less suitable** for use as either a main tunnel single drive site or reception/intermediate site because of the likelihood of highly contaminated ground and underground structures, and its location with respect to the river would require the main tunnel to deviate significantly from the river and pass directly under Heathwall Pumping Station or the Tideway Industrial Estate. The provision of jetty facilities would be difficult and subject to a number of constraints and there would be a need for overhead conveyors to transport excavated materials over Nine Elms Lane via S80WH. Also the location of this site means the alignment of the main tunnel would need to make a tight 124-degree return.
- 3.3.103 **Planning:** The site was considered **suitable** for use as a reception/intermediate site. The site has good transport and access connections onto Nine Elms Lane and the industrial context of the site means the works would be unlikely to have a detrimental effect on the amenity of the surrounding area.
- 3.3.104 The site was considered **less suitable** for use as a main tunnel single drive site. The use of overhead conveyors across Nine Elms Lane to manage the increased construction activity on the site, and the proximity of the jetties to residential properties at Elm Quay Court and the existing houseboat community, would have an unacceptable impact on amenity.
- 3.3.105 **Environment:** Overall, the site was considered **less suitable** for use as a main tunnel single drive site or reception/intermediate site. This was primarily due to the high potential for ground contamination of the site as a result of its previous use as a gas works. Known contamination issues included heavy metals and the potential to encounter underground tanks on site and subterranean tar lagoons that were not mapped. Remediation costs would therefore likely be extensive.
- 3.3.106 Based on the information available at the time, the site was **suitable** from the perspectives of transport, archaeology, built heritage and townscape, flood risk and water resources (surface water). For the reception/intermediate option, the site was also considered **suitable** from the perspective of ecology.
- 3.3.107 The site was considered **less suitable** from the perspectives of water resources (hydrogeology), noise, and air and land quality. For the single main tunnel drive option, the site was also considered **less suitable** from the perspective of ecology.
- 3.3.108 **Socio-economic and community:** The site was considered **less suitable** for use as either a main tunnel single drive site or a reception/site.

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- 3.3.109 The use of this site and the associated infrastructure appeared likely to affect residents of Elm Quay Court and the houseboat community in the vicinity. Works in this location could also impact on any future residents of the Tideway industrial development, the Royal Mail Sorting Office site and users of the US Embassy site.
- 3.3.110 **Property:** The site was considered **less suitable** for use as a main tunnel single drive or reception/intermediate site due to acquisition risks and high acquisition costs. The site appeared to be in private ownership and therefore compulsory purchase of the site was possible. However, the site would command residential development value and the acquisition cost would be very high for the single drive option. Furthermore, if development commenced, the site might no longer be available for acquisition, which would represent a significant risk to the project.
- 3.3.111 We have also received an initial objection to the use of this site in strong terms from the US Government, as it is adjacent to the new US Embassy site. If the US Government mounted an objection to the use of this site, this would represent a significant risk of failure to get confirmed compulsory purchase powers to acquire the site.

#### **S95WH: Depots, Ponton Road**

- 3.3.112 Site S95WH largely comprises a number of low-rise distribution depots, an electricity substation and part of the South Bank Business Centre. The proposed site fronts onto Nine Elms Lane and is bounded to the west by the proposed American Embassy site, to the northeast/east by New Covent Garden Flower Market and by railway lines to the south. The site is located in the Vauxhall Nine Elms Battersea Opportunity Area in the London Borough of Wandsworth
- 3.3.113 The site was considered for use as a main tunnel double or single drive site and a reception/intermediate site.
- 3.3.114 **Engineering:** This site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site because the site is large enough, close to the river and the tunnel would not have to pass below any third-party structures. One disadvantage was that the river access is separated from the site by Nine Elms Lane, which would require excavated materials conveyors to cross over Nine Elms Lane at a high level, and materials would have to traverse along Nine Elms Lane from Middle Wharf.
- 3.3.115 **Planning:** The site was considered **suitable** for use as a reception/intermediate site. The site had good transport and access connections onto Nine Elms Lane, and the industrial context of the site meant that the works would be unlikely to have a detrimental effect on the amenity of the surrounding area.
- 3.3.116 However, the site was considered **less suitable** for use as a main tunnel single drive site as it would likely have an unacceptable impact on the residents of Elms Quay Court and Riverside Court, situated to the north of the site and fronting onto the River Thames. The proposed overhead conveyor belt that would transport excavated materials from the site to the

jetty would pass between the two residential properties in close proximity. The barge movements to and from the jetty might also cause disturbance to the residents fronting the river.

- 3.3.117 The site was considered **not suitable** for the proposed main tunnel double drive option. The planning considerations and impacts grew in significance for a double drive with increased tunnelling activity and the associated intensification of noise, dust, lighting and traffic impacts. These impacts were of particular concern in relation to the use of the overhead conveyors and the potentially significant impact on residential amenity. A potential conflict in the relationship between the construction site and the adjacent proposed US Embassy might also become more critical due to the additional construction activity associated with a double drive concentrated on the same site area as a single main drive site.
- 3.3.118 **Environment:** Overall, the site was considered **suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. However, mitigation would be required to enable the site to be used.
- 3.3.119 Based on the information available at the time, the site was considered **suitable** from the perspectives of transport, archaeology, built heritage and townscape, flood risk, water resources (surface water) and ecology. The site was considered **less suitable** from the perspectives of water resources (hydrogeology), noise, and air and land quality.
- 3.3.120 **Socio-economic and community:** The site was considered **less suitable** for use as a reception/intermediate site due to the potential impact on the residential properties located opposite and overlooking the site and, to a lesser extent, the commercial businesses operating out of the premises, currently located on site and opposite the site to the northeast and southwest.
- 3.3.121 The site was considered **not suitable** for use as either a main tunnel double or single drive site due to the increased tunnelling work. This would involve greatly increased material inputs and removal and require the use of materials jetties and conveyors, which we proposed to locate opposite two large residential developments and to the east of a houseboat community moored on the foreshore. In addition, a greater number of businesses operating out of premises on the site would require relocation and there was greater potential to impact on business in the surrounding area.
- 3.3.122 **Property:** The site was considered **less suitable** for use as a main tunnel double or single drive site or a reception/intermediate site. The site appeared to be in private ownership which should present no significant procedural difficulty in acquiring the land using compulsory purchase powers. However, the site would command residential development value and the acquisition cost would be high. There was also the potential for high discretionary purchase costs.
- 3.3.123 We have received a strong initial objection from the US Government to the use of this site as it is adjacent to the new US Embassy site. If the US Government mounted an objection to the use of this site, this would

represent a significant risk of failure to get confirmed compulsory purchase powers to acquire the site.

## 3.4 Phase two consultation preferred site

- 3.4.1 Following the completion of the back-check process, we held a multidisciplinary workshop to identify the most suitable main tunnel site in Zone S5. This workshop took into account the site suitability report findings, potential drive options, feedback received during phase one consultation and interim engagement (carried out after phase one consultation and before phase two consultation).
- 3.4.2 In Zone S5 S72WH/S93WH: Kirtling Street (with Cringle Street) was identified as the most suitable main tunnel site.
- 3.4.3 We then considered the most suitable use of this site (ie, main tunnel double drive, single drive or reception/intermediate site) and potential drive options in the *Engineering options report – Abbey Mills route (Summer 2011)*. The preferred use of the site was determined by carrying out a series of comparisons of the site identified as most suitable in Zone S5. These comparisons involved comparing drive options based on the various uses (ie, the way in which the sites could be used to construct the tunnel) to identify a preferred main tunnel site and use. These are explained in Volume 1, Section 6.
- 3.4.4 On the basis of the assessments described above and professional judgement, it was agreed by all disciplines that **S72WH/S93WH: Kirtling Street (with Cringle Street)** should become the phase two preferred main tunnel drive site. We believed this to be the most appropriate site, subject to further engagement with stakeholders, further design development and phase two consultation.
- 3.4.5 In summary, S72WH/S93WH: Kirtling Street (with Cringle Street) was identified as the preferred site for the following reasons (not in order of importance):
- The site at S72WH/S93WH: Kirtling Street (with Cringle Street) is brownfield land in a predominantly industrial area where large-scale redevelopment is proposed in the Nine Elms Opportunity area.
  - S72WH/S93WH: Kirtling Street (with Cringle Street) has direct river access with a greater river frontage than site S93WH on its own, and much better river access compared to sites that would require construction materials to be transported across Nine Elms Lane.
  - The wider area of river frontage would allow for the construction of jetties and conveyors, which would result in improved barge access and could handle large seagoing vessels. These arrangements would help reduce the impact on nearby houseboats, but a number may still need to be relocated.
  - The Greater London Authority recommended use of this site in its formal response to our phase one consultation. Also, Kirtling Wharf is

### 3 Phase two consultation preferred main tunnel site: Scheme development and site selection process

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a safeguarded wharf and our proposed use would be consistent with this designation.

- e. The main shaft could be located adjacent to the river and therefore it is unlikely that the alignment of the main tunnel would pass under any significant buildings.
- f. The site forms part of the later stages of the Battersea Power Station redevelopment proposals and therefore offers the potential for complementary timescales of works.
- g. Use of this site also appears likely to cause less disruption to residents of Elm Quay Court than a number of the other options under consideration, which would have required more works in closer proximity to these properties.

3.4.6 While there were a number of reasons why Kirtling Street (with Cringle Street) was identified as our preferred site, the workshop identified there were a number of potential issues that we needed to address, particularly in relation to the Battersea Power Station development proposal, if this site were selected. The reasons included potential acquisition problems and costs, the impact of the permanent structures required to operate the tunnel with the regeneration plans for the site, and conflict with adjacent users.

3.4.7 Table 3.3 below sets out a summary of the preferred site and use.

**Table 3.3 Preferred site and use for phase two consultation**

**Site:** S72WH/S93WH: Kirtling Street (with Cringle Street)

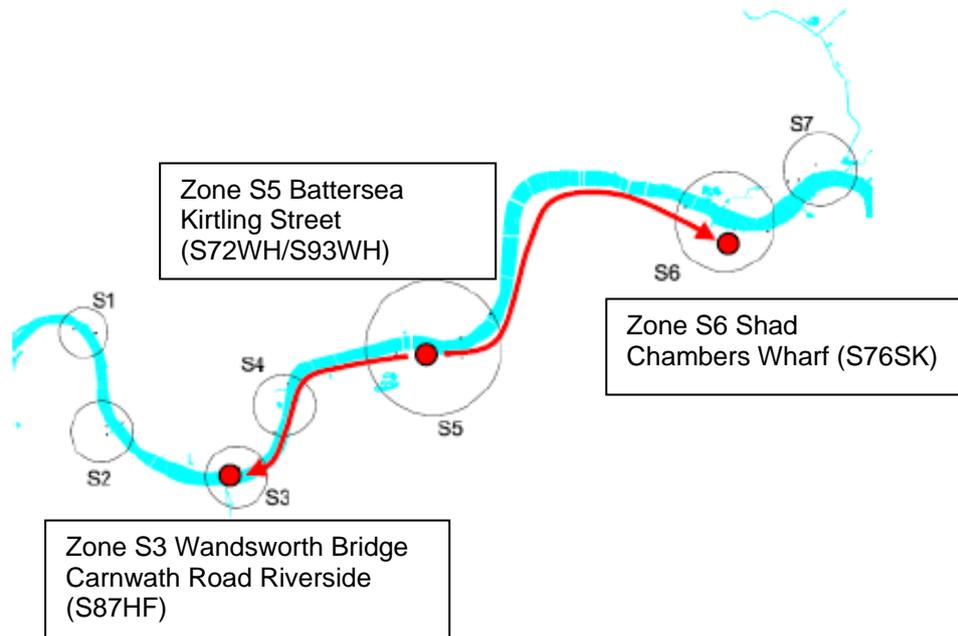
**Use:** To construct the central sections of the main tunnel by driving the main tunnel to Carnwath Road Riverside (S87HF) and driving the main tunnel to Chambers Wharf (S76SK)

3.4.8 We also confirmed the following at the same time and by using the same process:

- a. S87HF: Carnwath Road Riverside in Zone S3 as a preferred main tunnel drive (see Volume 9) – this site would be used to receive the main tunnel from Kirtling Street (with Cringle Street) and drive the main tunnel to Acton Storm Tanks in Zone S0
- b. S76SK: Chambers Wharf in Zone S6 as a preferred main tunnel drive site (see Volume 18) – this site would be used to receive the main tunnel from Kirtling Street (with Cringle Street) and drive the main tunnel to Abbey Mills Pumping Station in Zone S11

3.4.9 Figure 3.2 sets out the preferred phase two consultation drive strategy for the central sections of the main tunnel.

**Figure 3.2 Phase two consultation preferred sites and tunnelling strategy for the central section of the main tunnel**



## 4 Post phase two consultation: Review and confirmation of proposed main tunnel site for Section 48 publicity

### 4.1 Introduction to the review

- 4.1.1 This section explains how we implemented the requirement in the *Site selection methodology paper* to review the preferred site following phase two consultation and prior to Section 48 publicity. This stage took place from Spring 2012 to Summer 2012.
- 4.1.2 The review at this stage of the site selection process comprised:
- a. a review of comments from phase two consultation related to main tunnel sites and tunnelling options associated with Zones S1 to S4 for the western sections of the main tunnel as set out in the *Engineering options report - Abbey Mills route* (Spring 2012)
  - b. consideration of any ongoing scheme design and/or new technical information
  - c. multidisciplinary workshops and reviews to identify the proposed main tunnel site and use for Section 48 publicity.
- 4.1.3 The assessments described in Section 4 were based on the information available at the time and the related stage in the pre-application process.

### 4.2 Summary of phase two consultation feedback

- 4.2.1 Details of the consultation comments related to the Kirtling Street (with Cringle Street) site and our responses are provided in the *Report on phase two consultation*. The main concerns raised relevant to site selection can be summarised as follows:
- a. Alternative and shortlisted sites were not properly considered.
  - b. Shortlisted sites in relation to Battersea Power Station and part of Battersea Power Station were not properly considered.
  - c. Site selection should avoid sites in residential and/or densely populated areas. In particular, this site would impact on the Nine Elms Pier boat community.
  - d. Selection of this preferred site was poorly justified/inadequately explained; clarification is needed as to the need for the Kirtling Street site and an explanation as to why the Heathwall site does not suffice for both development proposals.
  - e. Use an alternative site. Suggestions included Cringle Wharf and Battersea Power Station.
  - f. Alternative drive strategies were suggested for the central section of the main tunnel.

- 4.2.2 The main comments received in support of the phase two consultation preferred site included:
- a. The identification of a new preferred site since phase one consultation is supported/the preferred site is more suitable than the site put forward at phase one and any alternative site.
  - b. The site is a brownfield site/in an industrial area and of limited value to the local community. Use of the site would have limited effects on the local area and the community.
  - c. The site selection is supported because the project needs to be undertaken.
- 4.2.3 We recognised the concerns that were raised, including impact on the local environment and site specific matters, and have taken these into account in developing the scheme, including measures which could be put in place to minimise any significant potential impacts.
- 4.2.4 In light of comments received suggesting alternative drive options prior to Section 48 publicity, we reviewed our tunnelling strategy and prepared a revised *Engineering options report - Abbey Mills route* (Spring 2012). This report concluded that the suggested alternatives would not add any new drive options, so the potentially feasible main tunnel drive options remained the same as those in the *Engineering options report - Abbey Mills route* (Summer 2011) set out prior to phase two consultation. Despite there being no new options, we still checked the sites and tunnelling drive options to ensure our assessments were still valid. This process did not lead to different sites or tunnelling strategy for the western section of the main tunnel (see Volume 1, Sections 6 and 7).
- 4.2.5 Having taken all comments received during phase two consultation into account, we considered that S72WH/S93WH: Kirtling Street (with Cringle Street) remained the most suitable main tunnel double drive site to construct the central sections of the main tunnel.

### 4.3 Consideration of project design or new information

- 4.3.1 Two planning permissions were recently granted and two planning applications were recently submitted by third parties, which constituted new information and a potential change in circumstances.
- 4.3.2 Outline planning permission was granted (application reference: 2011/1815) in March 2012 for the demolition of all existing buildings and construction of a mixed-use redevelopment on land to the south of Nine Elms Lane, comprising a DHL Depot, 1-12 Ponton Road and 51 Nine Elms Lane. The site subject to the planning permission included the S94WH/S80WH: Post Office Way site (split main tunnel site) and S95WH: Depots, Ponton Road site.
- 4.3.3 Outline planning permission was granted (application reference: 2011/2462) in March 2012 for the demolition of all existing buildings and construction of a mixed-use redevelopment at the South London Mail Centre, 53 Nine Elms Lane. The site subject to the planning permission

#### 4 Post phase two consultation: Review and confirmation of proposed main tunnel site for Section 48 publicity

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- included the S86WH: Post Office, Nine Elms Lane site (split main tunnel site).
- 4.3.4 A planning application was submitted (registered 27/02/2012) (application reference: 2012/0764) for the installation of additional concrete plant for a temporary period of four years, including erecting a new aggregate feed hopper and three cement silos connected by vertical conveyors; car and cycle parking; and relocation of existing temporary offices. The planning application area covered part of sites S72WH/S93WH: Kirtling Street (with Cringle Street - split main tunnel site) and S93WH: Kirtling Street.
- 4.3.5 A planning application was submitted under reference 2011/1926 for the redevelopment of Nine Elms Pier, Tideway Walk (to the east of S72WH/S93WH: Kirtling Street (with Cringle Street) and S93WH: Kirtling Street) to include demolition of the existing pier and erection of a new marina to provide permanent moorings for 33 houseboats. However, on 17 November 2011 the Department of Communities and Local Government issued an Article 25 Direction under Town & Country Planning (Development Management Procedure) (England) Order 2010 to prevent the Local Planning Authority from determining the application if they recommended approval.
- 4.3.6 Implementation of the planning application would have increased the number of sensitive receptors (houseboats) adjacent to the phase two consultation preferred site. These additional receptors could have experienced disturbance and might have required temporary relocation during our construction works, which had the potential to increase a number of compensation claims. The position of the new marina would have also obstructed our construction site layout, in particular the jetty and barge facilities required for river transport at the site. This potential scenario was determined as unacceptable by Secretary of State, who would only consider lifting the Direction on confirmation that an agreed position had been reached between the Local Planning Authority, the applicant and Thames Water. There were discussions between all parties to try to reach an amicable solution. Although this application represented new information, it did not cause a site selection issue. The application was prevented from being approved and implemented and, although likely to be more difficult and costly, it is considered that the construction effects could be mitigated.
- 4.3.7 There was also some new property information. Firstly, the part of S93WH that was occupied by the Victoria and Albert Museum, a Crown tenant, which cannot be acquired by compulsory purchase, is now vacant and has therefore reduced the acquisition risk related to this site. Secondly, on-going discussions between Cemex and the project team indicate it may be possible to work with them to mitigate any business disturbance related to the use of our preferred site.
- 4.3.8 Having considered this new information, we believed S72WH/S93WH: Kirtling Street (with Cringle Street) remained the most suitable main tunnel double drive site to construct the central sections of the main tunnel.

## 4.4 Proposed site and use for Section 48 publicity

- 4.4.1 Having completed the site selection review described above, we held a further multidisciplinary workshop prior to Section 48 publicity. On balance, the review process did not identify any additional considerations that would have caused us to change our preferred site from phase two consultation. **S72WH/S93WH: Kirtling Street (with Cringle Street)** remained the proposed main tunnel double drive site to construct the central sections of the main tunnel for Section 48 publicity for the following reasons (not in order of importance):
- a. It is brownfield land in a predominantly industrial area where large-scale redevelopment has been proposed in the Nine Elms Opportunity area.
  - b. The site has direct river access with a greater river frontage than site S93WH on its own, and much better river access compared to sites that would require construction materials to be transported over Nine Elms Lane. Site S72WH/S93WH also has good vehicular access directly off Nine Elms Lane (A3205).
  - c. Use of the site would avoid the loss of greenfield land at Battersea Park (a Grade II\* registered park and garden) and effects on listed buildings at Battersea Power Station.
  - d. Kirtling Wharf is a safeguarded wharf and our proposed use would be consistent with this designation.
  - e. The wider area of river frontage would allow for the construction of jetties and conveyors, which would improve barge access and enable large seagoing vessels to be used to transport construction materials. These arrangements would help reduce the impact on nearby houseboats, but a number may still need to be relocated .
  - f. Although part of the site forms part of the Battersea Power Station redevelopment proposals, this part is scheduled for the later development phases and therefore offers the potential for complementary timescales for works.
  - g. The main shaft would be located adjacent to the river and it is therefore unlikely that the alignment of the main tunnel would pass under any significant buildings.
  - h. The acquisition risk associated with the site was considered less than the other shortlisted sites. Given that the other sites were subject to planning permission for mixed-use development, and the costs associated with the Battersea Power Station sites would also be very high since the Battersea Power Station site has recently been sold as a single unit.
- 4.4.2 Table 4.1 below sets out the proposed site and use.

**Table 4.1 Proposed site and use for Section 48 publicity**

**Site:** S72WH/S93WH: Kirtling Street (with Cringle Street)

**Use:** To construct the central sections of the main tunnel by driving the main tunnel to Carnwath Road Riverside (S87HF) and driving the main tunnel to Chambers Wharf (S76SK)

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## 5 Post Section 48 publicity: Review and final selection of main tunnel site for the application

### 5.1 Introduction to the review

5.1.1 This section explains how we conducted a site selection review in order to arrive at the final selection of sites to be included in the application. This stage took place during Autumn 2012.

5.1.2 The final site selection review comprised:

- a. review of comments from Section 48 publicity related to main tunnel sites and tunnelling options associated with Zone S5 for the central sections of the main tunnel as set out in Volume 1, Section 6.6
- b. consideration of any ongoing project design and/or new technical information
- c. final review of shortlisted sites in Zone S5 which comprised multidisciplinary workshops and reviews to re-consider the various site and main tunnel drive comparisons and the rationale for selecting the main tunnel site and its use for the application.

### 5.2 Summary of Section 48 publicity feedback

5.2.1 Details of the comments to Section 48 publicity related to this site and our responses are provided in the *Consultation Report*. The main concerns raised relevant to site selection can be summarised as follows:

- a. Shortlisted sites have not been properly considered in relation to the Battersea Power Station site and Part of Battersea Power Station site.
- b. The shortlisted sites are unsuitable for the proposed use.

5.2.2 The main comments received in support of the proposed site included:

- a. Support review of site that has been undertaken in the pre-application process as this has resulted in reductions in the amount of land that needs to be acquired and in the impact on the townscape from new structures above ground.

5.2.3 Relevant Section 48 publicity comments were taken into account in the review of shortlisted main tunnel sites set out in Section 5.4 below.

### 5.3 Consideration of project design or new information

5.3.1 Planning permission was granted to expand the capacity of the concrete batching plant located on site S72WH/S93WH: Kirtling Street (with Cringle Street). However, discussions were ongoing with the site owner/operator and it was envisaged that the use of S72WH for the project could be facilitated simultaneously alongside the concrete batching plant.

## 5 Post Section 48 publicity: Review and final selection of main tunnel site for the application

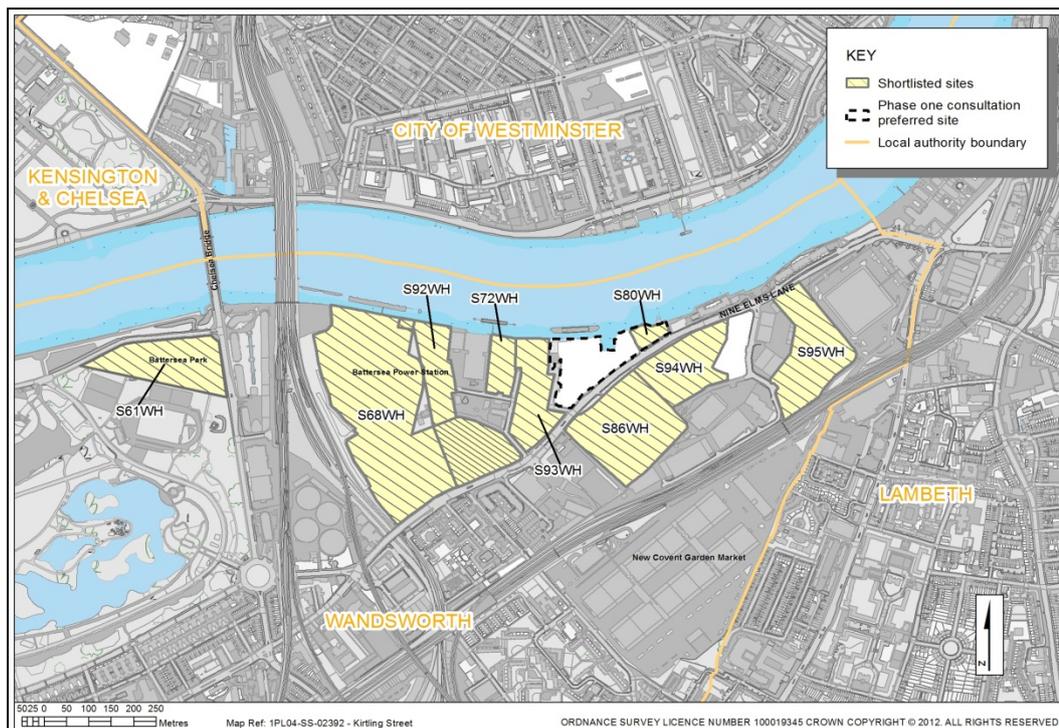
5.3.2 This new information was taken into account in the review of shortlisted main tunnel sites set out in Section 5.4 below.

### 5.4 Final review of shortlisted main tunnel sites in Zone S5

5.4.1 As part of the review process, all the phase two shortlisted sites in main tunnel Zone S5 were once again reviewed and compared following Section 48 publicity. For the avoidance of doubt, we did not re-review phase one shortlisted sites because we undertook a back-check following phase one consultation that generated an updated shortlist of sites, based on new information and this superseded the shortlist drawn up prior to phase one consultation. We reviewed the shortlisted site assessments presented in Section 3, which remain valid. To avoid unnecessary repetition, site specific points have not been reproduced in this section.

5.4.2 Below is a summary of the final list of shortlisted sites in Zone S5 and illustrated in Figure 5.1.

**Figure 5.1 Shortlisted main tunnel sites in Zone S5**



#### Zone S5 Battersea

5.4.3 Eight sites were shortlisted in Zone S5 Battersea as suitable for use as main tunnel drive or reception/intermediate sites:

- a. S61WH: Battersea Park
- b. S68WH: Battersea Power Station
- c. S72WH/S93WH: Kirtling Street (with Cringle Street) – split main tunnel drive site

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- d. S86WH/S80WH: Post Office, Nine Elms Lane – split main tunnel double drive site
- e. S92WH: Part of Battersea Power Station
- f. S93WH: Kirtling Street
- g. S94WH/S80WH: Post Office Way – split main tunnel drive site
- h. S95WH: Depots, Ponton Road.

5.4.4 The following is a summary of the points which distinguish between the shortlisted sites in Zone S5.

5.4.5 Battersea Park (S61WH) is a greenfield site and Grade II\* Registered Park and Garden, while all the other shortlisted sites in Battersea are brownfield sites within an area earmarked for major redevelopment. Use of a site in Battersea Park would result in the temporary loss of open space, and a special parliamentary procedure is likely to be required to secure the site, therefore giving rise to increased property acquisition risks. The temporary loss of open space would also potentially impact on park users and affect heritage features, townscape character and ecology.

5.4.6 Apart from the site in Battersea Park, all of the shortlisted sites now have outline permission for mixed use development. The use of any of these sites, could delay the approved redevelopment, which falls within the approved Vauxhall Nine Elms Battersea Opportunity Area Planning Framework.

5.4.7 Whilst parts of the site S93WH are within the planning application boundary to redevelop the Battersea Power Station, these areas form the latter proposed phases of the approved development, which is likely to be compatible with our construction timetable. Furthermore, the location of our permanent structures would be sited away from these areas in order that the proposals can be fully implemented as approved.

5.4.8 Planning permission was granted to expand the capacity of the concrete batching plant located on site S72WH/S93WH: Kirtling Street (with Cringle Street). However, discussions were ongoing with the site owner/operator and it was envisaged that the use of S72WH for the project could be facilitated simultaneously alongside the concrete batching plant, thereby mitigating business disturbance.

5.4.9 Battersea Power Station is a key feature in the area and is Grade II\* listed. The use of the S68WH: Battersea Power Station site would affect the setting of this heritage feature. Furthermore, as previously stated, the site has outline planning permission for mixed use development. The use of this site for the Thames Tideway Tunnel project would delay the early phases of this approved redevelopment.

5.4.10 The adjacent site S92WH: Part of the Battersea Power Station, also contains a listed building, the Battersea Water Pumping Station (Grade II). There is also an existing district heating plant which had a £6.9m upgrade in 2006 and serves around 4,500 homes and 60 businesses in the Pimlico area. The use of the site would require the relocation of this district

- heating plant. The site is also subject to the same outline planning permission as the main Battersea Power Station site (S68WH).
- 5.4.11 S93WH: Kirtling Street, S72WH/S93WH: Kirtling Street and sites to the south of Nine Elms Lane are further from the aforementioned heritage features.
- 5.4.12 The following sites are located on the River Thames with existing or potential access to wharf facilities: S61WH, S68WH, S72WH, S92WH and S93WH. Use of these sites would allow for the use of river barges for transport of excavated material, which would significantly reduce the volume of road transport associated with our construction works on the surrounding highway network. Sites which involve the use of S80WH or S93WH are likely to have the greatest impact on the houseboat community moored in the vicinity of these two sites.
- 5.4.13 The remaining sites S86WH: Post Office, Nine Elms Lane, S94WH: Post Office Way and S95WH: Depots, Ponton Road are further from the river and separated by Nine Elms Lane (A3205). S80WH is located on the River Thames and is adjacent to S86WH and S94WH, so it could be used in conjunction with these sites to facilitate access to the river. However, while sites S86WH, S94WH and S95WH have good access to Nine Elms Lane and road transport links, a solution involving the use of overhead conveyors would be needed to transport excavated material over the A3205 to enable river transport to be used. This would mean that the route to the river for the removal of excavated material would be much more difficult than from the sites immediately adjacent to the River Thames. Also, in the case of S95WH: Depots, Ponton Road, the overhead conveyors would have to pass between the residential properties Elm Quay Court and Riverside Court to provide a link to the river.
- 5.4.14 The use of these sites south of Nine Elms Lane (S86WH with S80WH, S94WH with S80WH and S95WH), which are further from the river than the other sites, would also mean that the alignment of the main tunnel would need to run inland and underneath a number of existing properties or proposed tall buildings, some of which have deep piled foundations and could cause settlement issues.
- 5.4.15 S86WH: Post Office, Nine Elms Lane and S94WH: Post Office Way sites both have greater risk of being contaminated as they were previously part of the Nine Elms Gas works. In addition, it is anticipated that the feasibility of a shaft at the S86WH: Post Office, Nine Elms site could potentially be affected by the Northern Line Extension proposals.
- 5.4.16 The location of the shaft within the Battersea Power Station sites (S68WH and S92WH) would be very constrained by existing service and utility tunnels and shafts around the site and impact on the listed structure itself. The main tunnel would also have to pass close to the south abutment of Grosvenor Bridge (rail) and would require a tighter radius turn resulting in greater tunnelling risk.

## Conclusion of review of Zone S5 sites

- 5.4.17 All the shortlisted sites in Zone S5 were constrained in some manner, but on balance and potential for mitigation to address site issues, S72WH/S93WH: Kirtling Street (with Cringle Street) was identified as the most suitable main tunnel double or single drive or reception site. This site was then used to review the tunnelling drive options below, which is the final part of the process in determining the selected site and use.

## 5.5 Final review of tunnelling drive options

- 5.5.1 Having established the most suitable site in each zone for each site use (ie, drive or reception), we then reviewed the drive options. The drive options were set out in *Engineering options report – Abbey Mills route* (Spring 2012) and explained in Volume 1, Section 6.6 (also see Volume 1, Section 7.6 for an update). In summary, when we considered the possible drive options, these were refined down to a requirement for a main tunnel double drive site in Zone S5 Battersea. Compared to other adjacent zones, Zone S5 had more potential large sites and was assessed as more capable of accommodating a main tunnel double drive site due to the predominately industrial character of the area.
- 5.5.2 Overall it was concluded that S72WH/S93WH: Kirtling Street (with Cringle Street) should be selected as the main tunnel double drive site with one drive to the west to Carnwath Road Riverside (see Volume 9) and another drive to the east to Chambers Wharf (see Volume 18).

## 5.6 Selected site for the application

- 5.6.1 In summary, we reviewed and considered:
- Section 48 publicity feedback
  - any relevant changes and/or new information
  - shortlisted sites and tunnelling drive option comparisons.
- 5.6.2 The final site selection review described above culminated in a multidisciplinary workshop following Section 48 publicity. On balance, the review process did not identify any new considerations that would have caused us to change our proposed site from Section 48 publicity. Therefore, **S72WH/S93WH: Kirtling Street (with Cringle Street)** was selected as the main tunnel site for the application for the following reasons (not in order of importance):
- The site comprises primarily brownfield redevelopment land in the Nine Elms Opportunity area.
  - Part of the site is now within Thames Water ownership, which reduces acquisition risk.
  - The site has direct river access with a greater river frontage than site S93WH on its own, and much better river access compared to sites that would require construction materials to be transported over Nine

5 Post Section 48 publicity: Review and final selection of main tunnel site for the application

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Elms Lane. Site S72WH/S93WH also has good vehicular access directly off Nine Elms Lane (A3205).

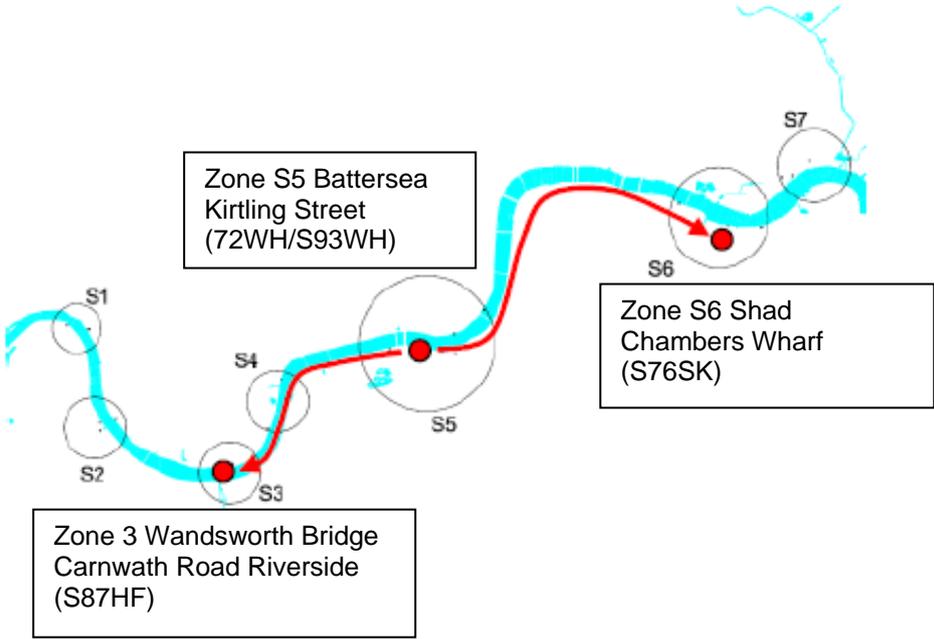
- d. The use of site would avoid the loss of greenfield land at Battersea Park (a Grade II\* registered park and garden) and limit effects on listed buildings at Battersea Power Station (Grade II\* listed) and Battersea Water Pumping Station (Grade II listed).
- e. Kirtling Wharf is a safeguarded wharf and our proposed use would be consistent with this designation and not affect the potential for future use.
- f. The wider area of river frontage would allow for the construction of jetties and conveyors, which would improve barge access and enable the use of large seagoing vessels to transport construction materials. These arrangements would help reduce the impact on nearby houseboats, but a number may still need to be relocated.
- g. Although part of the site forms part of the Battersea Power Station redevelopment proposals, this section is scheduled for the later development phases and therefore offers the potential for complementary timescales for works.
- h. The main shaft would be located adjacent to the river and it is therefore unlikely that the alignment of the main tunnel would pass under any significant buildings.
- i. The site is safeguarded therefore mitigating the risk of the site becoming unavailable due to development commencement.

5.6.3 Table 5.1 below sets out the selected site and use. Figure 5.2 illustrates the selected sites and tunnelling strategy for the construction of the central section of the main tunnel.

**Table 5.1 Selected site and use for the application**

<p><b>Site:</b> S72WH/S93WH: Kirtling Street (with Cringle Street)</p> <p><b>Use:</b> To construct the central sections of the main tunnel by driving the main tunnel to Carnwath Road Riverside (S87HF) and driving the main tunnel to Chambers Wharf (S76SK)</p>
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**Figure 5.2 Sites and tunnelling strategy for the central section of the main tunnel**



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