12 Carnwath Road Riverside

12.1 Introduction

12.1.1 This section of the non-technical summary presents the preliminary environmental assessment for the Thames Tunnel project at the Carnwath Road Riverside site (Figure 12.1).

12.1.2 The site at Carnwath Road Riverside has a number of key functions for the Thames Tunnel. Firstly, it would be used to drive the tunnel boring machine westwards to build the main tunnel which terminates at Acton Storm Tanks. Secondly, the tunnel boring machine which would be driven westwards from Kirtling Street would then be removed at the Carnwath Road Riverside site. Thirdly, the tunnel boring machine used to construct the connection tunnel from Dormay Street would also be received at the Carnwath Road Riverside site. Fourthly, throughout the length of the proposed Thames Tunnel there would be a secondary lining. The secondary lining between Carnwath Road Riverside and Acton Storm Tanks would be carried out simultaneously from both ends of this stretch of main tunnel. Finally, this site would include ventilation facilities. It is noted that there is no combined sewer overflow at this site.

12.1.3 In the following section a description of the existing site is given. This is followed by a description of the development proposed at this site.

12.1.4 The environmental topics which have been assessed for this site are listed in the ‘Assessment’ section (0). Preliminary assessment findings are then presented topic by topic.

12.2 Site context

12.2.1 The site position along the route of the Thames Tunnel is shown as site number 7 on Figure 28.1.

12.2.2 The Carnwath Road Riverside site is located within the London Borough of Hammersmith and Fulham (Figure 12.1).
12.2.3 The site includes Hurlingham Wharf, a safe-guarded wharf which is currently vacant and has not been used as an operational wharf for thirteen years, as well as Whiffin Wharf to the west. Carnwath Road Industrial Estate is to the east and contains a number of two storey industrial, warehouse and retail units. During construction the site would extend into the River Thames forming the southern boundary of the site. Existing access is via Carnwath Road. The construction area extends over approximately 3.5 hectares as indicated by the red line shown on Figure 12.2. The area of land required for the permanent works would be substantially smaller than that required for construction.
12.3 Proposed development

12.3.1 A shaft measuring approximately 25 metres in diameter with a depth of approximately 42 metres is proposed. The shaft has been sized to facilitate access for launching and removing the tunnel boring machines as well as providing access into the shaft and tunnel for maintenance purposes.

12.3.2 The proposed development would include the construction of a 6.5 metre internal diameter main tunnel from Carnwath Road Riverside to Acton Storm Tanks (site number 1 on Figure 28.1). This would be a continuous 24 hour construction operation, with almost all of the excavated material from the tunnelling transported away by barge.

12.3.3 The tunnel boring machine used to excavate the main tunnel driven westwards from Kirtling Street (site number 11 on Figure 28.1) would be removed at Carnwath Road Riverside. A further tunnel boring machine used to excavate a connection tunnel which would be driven northwards from Dormay Street would also be removed at the Carnwath Road Riverside site. There would be flows into this connection tunnel from the combined sewer overflows at Dormay Street (site number 5 on Figure 28.1) and King George’s Park (site number 6 on Figure 28.1) with these flows then transferred into the main tunnel.
12.3.4 It is assumed that there would be secondary lining proposed along the length of the main tunnel. Carnwath Road is one of the sites from where secondary lining would be carried out. The purpose of secondary lining of the main tunnel is to increase durability, to enhance structural integrity, to reduce the possibility of leaks out of the tunnel and to also avoid leaks into the tunnel from groundwater.

12.3.5 Access into the site during construction would be from Carnwath Road as well as from the river front for barging.

12.3.6 In order to manage and mitigation the effects on the environment during construction, a Code of Construction Practice has been drafted. This sets out measures to be adhered to during construction.

12.3.7 Figure 12.3 shows an indicative plan of the construction works.

**Figure 12.3 Indicative plan of construction works for Carnwath Road Riverside**

12.3.8 Once the works at the site have been built, a number of permanent features would remain (Figure 12.4). The shaft would be finished to match the existing ground level with covers on the shaft top. There would be an area around the shaft covers provided to ensure ease of access into the shaft and tunnel for inspection and maintenance purposes. Access for maintenance purposes would be required every three to six months, and once every ten years when more substantial maintenance works would be required. Access to the site is proposed off Carnwath Road.
12.3.9 Tunnel air would be circulated and filtered to avoid it becoming stale. To promote circulation, air would be extracted out of the tunnel by fans at Carnwath Road Riverside where it would also be filtered. There would be a ventilation building at the site which would house the fans and filters. The building would be approximately 9.5 metres high. After filtering, the air would be expelled to atmosphere via a separate 15 metre high ventilation column located close by. From time to time, when the tunnel is filling up, air would also be displaced, without help from fans, and expelled via the same building and ventilation column. In addition, when the tunnel is emptying each site along the route of tunnel has an inlet through which air can be drawn back into the tunnel. This would require filtering. These measures would ensure that air released via the ventilation column does not contain odour.

12.3.10 A brown roof is proposed on the ventilation building. A brown roof is specifically designed to promote local biodiversity through covering the roofs of buildings with particular materials. This often comprises rubble and gravels, which are low in nutrients and promote natural colonisation of brown field plant species, which are of particular value to insects and birds.

**Figure 12.4 Carnwath Road Riverside indicative plan of built development**
12.4 **Assessment**

12.4.1 Based on the existing site and the works proposed, the following environmental topics have been included in the scope of this preliminary environmental assessment:

a. Air quality and odour  
b. Ecology – aquatic and terrestrial  
c. Historic environment  
d. Land quality  
e. Noise and vibration  
f. Socio-economics  
g. Townscape and visual  
h. Transport  
i. Water resources (ground and surface)  
j. Flood risk

12.4.2 In the following sections, information about the preliminary assessment of each of these topics is presented.

12.4.3 As part of the assessment process, consideration has been given to known major developments that may change future environmental conditions. To the west of the site on Carnwath Road there is a planning application for 150 flats called Baltic Saw Mills. It has been assumed that this scheme will be completed by 2016. There is also a planning permission for the Fulham Wharf development, to the east of Hammersmith Bridge Road. This is for a supermarket and 463 dwellings.

12.4.4 Further information on the topic specific methodology for conducting the assessment is given in section 4 of this non-technical summary.

12.5 **Air quality and odour**

12.5.1 The Carnwath Road Riverside site is located within the London Borough of Hammersmith and Fulham Air Quality Management Area. Local monitoring data indicates that there are currently exceedences of the air quality standards in the vicinity of the site. The nearest people who may be sensitive to the development are occupiers of the nearby residential dwellings (adjacent to the site and in Carnwath Road and Dymock Street), commercial/leisure premises (adjacent to the site and in the Piper Building north of the site) as well as pupils and staff at Thomas’ Fulham School.

12.5.2 Based on this preliminary assessment, It is considered that the overall effect on local air quality from construction road traffic, river barges and construction plant is likely to be minor adverse at the residential properties and school, and negligible at the commercial/leisure premises. In terms of construction dust, there is likely to be a minor adverse effect on nearby residential and commercial/leisure properties. A negligible effect is predicated at Thomas’ Fulham School, taking account of the dust control measures in the Code of Construction Practice.
12.5.3 Preliminary assessment findings indicate that the effects of odours released from the ventilation column is likely to be minor adverse.

12.5.4 Based on this preliminary assessment, it is considered that mitigation measures are unlikely to be required.

12.6 **Ecology – aquatic**

12.6.1 The proposed construction works would include a levelled area on the river bed adjacent to the landward edge of site. This would provide a level surface onto which barges could rest on low tide. Without this, there is a risk that barges could stick to the river bed and be flooded as the tide rises. This feature would be located in the River Thames and Tidal Tributaries Site of Metropolitan Importance. The intertidal habitat is relatively narrow in this section of the river due to development on either bank, and the river is confined by a man-made vertical river wall. Data searches indicate that the site has a relatively high diversity of freshwater and estuarine fish species.

12.6.2 Construction effects would be managed in accordance with the Code of Construction Practice. With the Code in place and based on the assessment to date it is anticipated there would be minor adverse effects on designated sites and habitats. Effects on mammals would be negligible. Effects on fish from light spillage would be moderate adverse, whilst all other effects on fish would be minor adverse. All effects on invertebrates are considered to be negligible.

12.6.3 There is no combined sewer overflow outfall discharge at this site, and so the scheme would have no effect on aquatic habitats during operation.

12.6.4 Measures are included within the Code of Construction practice to manage construction effects, and no further mitigation during construction is considered to be possible at this stage of the assessment.

12.7 **Ecology – terrestrial**

12.7.1 The site mainly comprises buildings and bare ground with a small area of dense scrub and a few scattered trees, and an area of foreshore. The site is likely to be of value to foraging and commuting bats, foraging and resting wintering birds, and foraging and nesting black redstarts. Surveys are ongoing and results will be reported in the Environmental Statement. Japanese knotweed, an invasive plant, may be present on site and will be removed prior to construction where required.

12.7.2 Based on preliminary assessment findings, no adverse effects on designated sites are anticipated due to the localised nature of construction activities and their distance from designated sites (aquatic ecology effects are considered in section 12.6). Habitat loss on site would have a site level adverse effect and would have a site level adverse effect on breeding birds. The significance of habitat loss and disturbance effects on black redstarts, bats and wintering birds on and adjacent to the site will be assessed and reported in the Environmental Statement.
12.7.3 It is anticipated that operational activity would be limited to occasional maintenance works, which are considered unlikely to have significant effects on terrestrial ecology. A brown roof is proposed on the ventilation building which would promote local biodiversity.

12.7.4 In addition to measures included within the Code of Construction Practice to manage construction effects on the ecology of the site, replacement planting would be required to mitigate for the loss of habitat and effects on breeding birds. Further measures, such as habitat creation for bats, black redstart and wintering birds will be formulated subject to survey results, if required. This will be reported in the Environmental Statement.

12.8 Historic environment

12.8.1 The site does not contain any nationally designated heritage assets, nor are there any in the near vicinity. The site lies within the locally designated Sands End Conservation Area (of high heritage asset significance). The Thames river wall (of low heritage asset significance) and part of the Thames foreshore lie within the southern part of the site. The main potential in terms of buried heritage is for palaeoenvironmental remains, e.g. organic remains such as pollens or plant fossils, of low or medium heritage asset significance, and for post-medieval remains, including the footings of an early 20th century ambulance centre and industrial buildings (of low or medium heritage asset significance). There is also an uncertain, probably moderate potential for isolated prehistoric artefacts (of low heritage asset significance). A historic map of the site is shown in Figure 12.5.

**Figure 12.5 Historic environment OS 25” scale map of 1954–8**

![Historic environment OS 25” scale map of 1954–8](image-url)
12.8.2 Construction works would entail deep excavations which would entirely remove any assets which may be present within the footprint of these works. Preliminary assessment findings indicate that this would comprise a minor adverse effect for palaeoenvironmental remains and prehistoric artefacts, and a minor or moderate adverse effect for post-medieval remains.

12.8.3 The desk-based study of the site suggests that no heritage assets of very high significance are anticipated that might merit a mitigation strategy of permanent preservation in situ. Any adverse effects which may arise could be successfully mitigated by a suitable programme of archaeological investigation before and/or during construction, drawing on a range of techniques. This would include subsequent dissemination of the results and so achieve preservation by record.

12.8.4 Effects on the historic environment arising from the operation of the Thames Tunnel infrastructure, on assets including the Sands End Conservation Area, will be assessed and presented in the Environmental Statement. Effects could include effects on the historic setting of heritage and effects on buried heritage assets in the foreshore from scouring due to changes in river flows due to the new infrastructure in the channel. Any mitigation requirements for operational effects will also be presented in the Environmental Statement.

12.9 Land quality

12.9.1 A search of historical and environmental data indicates that the site was developed as wharves which occupied both the site and the adjacent sites to the east and west. The wharves were subsequently utilised as other industrial activities from the 1950s through to the 1980s. These included cement works, a petroleum depot and asphalt works. The surrounding area has also been subject to a number of commercial and industrial works through the 20th century. This has included the filling in of a gravel pit, chemical works, concrete works, laundry, and warehousing. Remnants of this still exist (notably to the northwest of the site).

12.9.2 There is presently no ground investigation data for the area, although local authority consultation has recorded some contamination of the adjacent retail park with tars and associated contaminants. It is considered that the foreshore sediments would not be significantly affected by contamination; however, further studies are underway to confirm this. Desk based surveys have identified a low/medium risk from unexploded ordnance.

12.9.3 Based on preliminary assessment findings, there may be a slight adverse effect on construction workers due to the potential for exposure to contaminated soils or other materials if they are present, although any exposure risk would be short-term. There would be a negligible effect on the built environment as it is considered unlikely that contaminants contained in subsurface materials would affect buried structures. The preliminary assessment therefore identified no need for mitigation during the construction phase.
12.9.4 During operation there would be negligible effect on future users and the built environment. The assessment identified no need for mitigation during the operational phase.

12.10 Noise and vibration

12.10.1 Noise conditions in the area of the site are dominated by road traffic noise and the operation of the industrial and commercial units to the east and west of the site. The nearest locations to the site which are sensitive to noise and vibration are residential dwellings located to the north, east and west of the site.

12.10.2 Based on preliminary assessment findings, significant noise effects arising from construction activities are predicted at residential properties on Carnwath Road and Dymock Street, and in the Piper Building and Philpot Square. Significant vibration effects arising from construction activities are also predicted at residential properties on Carnwath Road. No significant effects as a result of the operation of the site are predicted.

12.10.3 During construction activities, the contractor would be required to follow best practice (as described in the Code of Construction Practice) at all times to reduce noise and vibration effects on the local community for example through suitable siting of equipment on site.

12.10.4 Beyond best practice measures it is anticipated that additional mitigation would be required to address significant noise and vibration effects. This could include the use of localised screens and enclosures to reduce noise from particularly noisy, static operations.

12.10.5 The next stage of the assessment will profile the variation in construction noise levels across the programme of work with the aim of refining mitigation design and seeking to reduce the significant effects of construction noise and vibration. Further details of mitigation measures will be provided in the Environmental Statement including the significance of residual effects once mitigation has been taken into account.

12.11 Socio-economics

12.11.1 The site principally comprises three parcels of land; two wharves, both of which are vacant or in temporary use and an industrial estate. The Thames Path also runs through the site area (Figure 12.6). Residential dwellings and commercial/light industrial uses, including retail businesses and small offices surround the site. The Thames Path is moderately well used by local residents and employees.

12.11.2 Preliminary assessment findings indicate that during construction, there are likely to be major adverse effects on amenity on residents of nearby properties and moderate adverse effects arising from the displacement of business activity. The temporary diversion of a section of the Thames Path, amenity impacts on Thames Path users and the temporary loss of industrial employment land is considered to have negligible effects. Socio-economics effects once the tunnel is built and operational are considered to be negligible.
12.11.3 In completing the assessment, there is scope for further construction phase mitigation measures to be incorporated in the design with the aim of seeking to reduce significant adverse amenity effects which have been identified in this preliminary assessment.

12.11.4 For the operational phase, there are not expected to be any socio-economic effects at Carnwath Road Riverside which require mitigation.

**Figure 12.6 Thames river path - adjacent to the western boundary of the site**

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12.12 Townscape and visual

12.12.1 The site is located within the Sands End Conservation Area on the north bank of the River Thames, to the south of a large residential area surrounding significant open spaces including Hurlingham Park and South Park. Disused wharves and commercial premises dominate the site to the east and west. The surrounding townscape is predominately residential with the exception of some commercial units in the vicinity.

12.12.2 Based on preliminary assessment findings, during the construction phase the presence of cranes, site hoardings and the intensity of construction activity are anticipated to have a moderate adverse effect on the site, River Thames, Sands End Conservation Area, Fulham Commercial, Fulham Residential and Smugglers Way Large Scale Development areas. There would be a minor adverse effect on Thameside Residential area and Bell Lane Creek. Once operational, preliminary assessment findings indicate that there are anticipated to be moderate beneficial townscape effects including the site, River Thames, Sands End Conservation Area, and Fulham Commercial. This is due to the creation of new public realm
and high quality buildings. There would be minor beneficial effects at Fulham Residential and Bell Lane Creek due to the clearance of commercial buildings and introduction of high quality public realm. There would be negligible to minor beneficial townscape effects on Smugglers Way Large Scale Development, Osiers Road Commercial and Wandsworth Park due to the high quality design of the ventilation building and public realm. The level of significance is dependent on the design and will be reported in the Environmental Statement.

12.12.3 In terms of visual amenity, preliminary assessment findings indicate that during construction phase there would be major adverse visual effects on views south west from Carnwath Road, north west from Smugglers Way and north east from Eastfields Avenue. This is as a result of the visibility of construction activity and river traffic. There would be moderate adverse effects on the view east from the Thames path and minor adverse effects at Point Pleasant, Bell Lane Spit and Thames Path at Wandsworth Park resulting from background visibility of construction activity and presence of cranes. Preliminary assessment findings indicate that once operational there would be a moderate beneficial effect on the view from Carnwath Road and minor to moderate beneficial effects on four viewpoints including views from Smugglers Way, Eastfields Avenue and Wandsworth Bridge (Figure 12.7) due to new public realm and the high quality design of the ventilation building. There would be a minor beneficial visual effect on five viewpoints due to the background visibility of new public open space. The level of significance is dependent on the design and will be refined for the Environmental Statement.

12.12.4 Mitigation measures to be employed during the construction phase are being incorporated into the proposals, for example, through use of capped and directional lighting when required. In terms of operation, a process of iterative design and assessment has been employed to reduce adverse effects and promote improvements. It is likely that there would be no significant adverse effects during operation and therefore no further mitigation is proposed.

Figure 12.7 View west from Wandsworth Bridge
12.13 **Transport**

12.13.1 The Carnwath Road Riverside site has poor public transport accessibility being located over 1km from National Rail and Underground stations. The site is on the south side of Carnwath Road (Figure 12.8) and construction vehicle access is proposed via the A4 or A40, A217 and King’s Road (A308) to the north of the site and the A217 and A3 to the south.

12.13.2 As with all main tunnel drive sites, it is assumed that 90% of excavated material would be transported by barge and all other materials would be transported by road. During construction, the number of heavy goods vehicle movements would be moderate. The nature of the construction site layout at this location is considered likely to result in a minor adverse effect on road network operation and delay. Effects on pedestrian and cyclist amenity and safety are expected to be moderate adverse on account of the loss of footway and widened junctions. A negligible effect is expected on rail and river passenger services while the effect on bus services would be minor adverse. During the operational phase there would be very occasional vehicle trips to and from the site for maintenance activities but these would have a negligible effect on the surrounding transport networks.

12.13.3 The project is being designed to limit the effects on the transport networks as far as possible. At this location, mitigation measures during the construction phase are likely to be required and would take the form of modifying junction signal timings and the protection of pedestrian routes providing safe crossing points where appropriate. Mitigation is not required for the operational phase.

*Figure 12.8 Traffic calming measures on Carnwath Road*
12.14 Water resources - ground water

12.14.1 The shaft would pass through the upper aquifer and into the underlying non-aquifer (London Clay). The shaft would not penetrate the lower aquifer beneath (Chalk). There is one licensed groundwater abstraction situated in the upper aquifer in the nearby area. The most sensitive aspect with regard to ground water is the upper aquifer which is defined as being of medium value.

12.14.2 Construction and operational effects on the upper aquifer would be limited to physical obstruction to groundwater flow and this is anticipated to be negligible.

12.14.3 The groundwaters at the site could be contaminated (see section 12.9) and this will be determined by site investigation. If contamination is identified, this would be dealt with using a risk based approach and appropriate remediation ahead of construction. The effect on groundwater quality is considered to be negligible at this stage.

12.14.4 Groundwater monitoring of water levels and water quality would continue during construction.

12.15 Water resources – surface water

12.15.1 The site is located in the River Thames foreshore within the Thames Upper waterbody, as classified under the Thames River Basin Management Plan. There is also the possibility for effects on the downstream Thames Middle waterbody, which has also been considered in the assessment. The Thames Upper and Middle waterbodies are currently classified under the Water Framework Directive as being at moderate potential status, with a status objective of good potential by 2027. There are a number of nationally and locally designated water dependent conservation sites within 2 kilometres of the proposed site.

12.15.2 There is the potential for effects on surface water resources from the proposed construction works through surface water runoff and exposure of the drainage system to contaminants. After taking into account the measures incorporated into the design and Code of Construction Practice, such effects are expected to be manageable and not significant. No mitigation would therefore be required.

12.15.3 There is also potential for the loss in river bed from the construction to change the river flows, which could lead to scour at the flood defences. The effects would be largely temporary during construction as some natural foreshore restoration would occur after temporary construction structures are removed. Any mitigation that is required will be explored in the Environmental Statement.
12.16 **Flood risk**

12.16.1 The main source of flood risk to the site is the tidal River Thames and the site is located within the ‘high probability’ flood zone, although it is protected by flood defences which run along the river bank (Figure 12.9).

12.16.2 The site may be at risk of localised surface water flooding due to runoff generated by land to the north. The presence of structures within the foreshore, as part of the construction works, could impact flow within the River Thames. The work required to construct the tunnel beneath the site also has the potential affect the local flood defences; further studies are being completed to assess these impacts.

12.16.3 The current level of protection afforded by the defences would be maintained on the site. The effects of changes in scour and deposition as a result of the temporary structures would be reduced through good practice design. No changes are proposed to the percentage of hard standing on the site and it is intended that this area would continue to be served by the local drainage system.

![Figure 12.9 Existing flood defences present at the site](image)

12.17 **Further information**

12.17.1 Further information regarding preliminary assessment findings for Carnwath Road Riverside can be found in Volume 13 of the Preliminary Environmental Information Report.