Spring 2010

Site Suitability Report
S76HF

Former part of Imperial Wharf, Imperial Crescent
Please note:

After phase one consultation this site suitability report was reviewed as part of a ‘back-check’. This report was reviewed by each discipline (engineering, planning, environment, community and property), but the report was not updated as the general overall site conclusions remained valid. Further details are provided in the Final Report on Site Selection Process (doc ref: 7.05) that can be found on the Thames Tideway Tunnel section of the Planning Inspectorate’s web site.
Site Suitability Report
S76HF

Former part of Imperial Wharf,
Imperial Crescent
# THAMES TUNNEL

## SITE SUITABILITY REPORT S76HF

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<th>Description</th>
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<tr>
<td>AOD</td>
<td>above Ordnance Datum</td>
</tr>
<tr>
<td>BAP</td>
<td>Biodiversity Action Plan</td>
</tr>
<tr>
<td>BT</td>
<td>British Telecom</td>
</tr>
<tr>
<td>CPO</td>
<td>compulsory purchase order</td>
</tr>
<tr>
<td>CSO</td>
<td>combined sewer overflow</td>
</tr>
<tr>
<td>DLR</td>
<td>Docklands Light Railway</td>
</tr>
<tr>
<td>EA</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>GLA</td>
<td>Greater London Authority</td>
</tr>
<tr>
<td>HGV</td>
<td>heavy goods vehicle</td>
</tr>
<tr>
<td>LNR</td>
<td>local nature reserve</td>
</tr>
<tr>
<td>LPA</td>
<td>local planning authority</td>
</tr>
<tr>
<td>LU</td>
<td>London Underground</td>
</tr>
<tr>
<td>m</td>
<td>metre/metres</td>
</tr>
<tr>
<td>MOL</td>
<td>Metropolitan Open Land</td>
</tr>
<tr>
<td>ONS</td>
<td>Office of National Statistics</td>
</tr>
<tr>
<td>ORN</td>
<td>Olympic Route Network</td>
</tr>
<tr>
<td>PLA</td>
<td>Port of London Authority</td>
</tr>
<tr>
<td>POS</td>
<td>public open space</td>
</tr>
<tr>
<td>PTAL</td>
<td>public transport accessibility level</td>
</tr>
<tr>
<td>SAM</td>
<td>scheduled ancient monument</td>
</tr>
<tr>
<td>SINC</td>
<td>site of importance for nature conservation</td>
</tr>
<tr>
<td>SNCI</td>
<td>site(s) of nature conservation importance</td>
</tr>
<tr>
<td>SSR</td>
<td>site suitability report</td>
</tr>
<tr>
<td>SSSI</td>
<td>site(s) of special scientific interest</td>
</tr>
<tr>
<td>SuDS</td>
<td>sustainable urban drainage systems</td>
</tr>
<tr>
<td>TFL</td>
<td>Transport for London</td>
</tr>
<tr>
<td>TD</td>
<td>tunnel datum</td>
</tr>
<tr>
<td>TLRN</td>
<td>Transport for London Road Network</td>
</tr>
<tr>
<td>TPA</td>
<td>Thames Policy Area</td>
</tr>
<tr>
<td>UDP</td>
<td>unitary development plan</td>
</tr>
<tr>
<td>UXO</td>
<td>unexploded ordnance</td>
</tr>
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</table>
1 INTRODUCTION

1.1 Purpose and structure of the report

1.1.1 The Site Selection Methodology (May 2009) paper (paragraphs 2.3.29 - 2.3.34) outlines the process to be used to create the preferred list of shaft sites, and this process also applies to CSO sites. Paragraph 2.3.31 lists the type of general considerations that will be addressed in each site suitability report, but they depend on the relevance to the site and professional judgement made in the assessments.

1.1.2 This report was prepared through the assessment of information from the perspective of a number of technical disciplines: Engineering, Planning, Environment, Property and Community. The reports have been prepared on the basis of the information listed in Appendix 1 - Sources of Information, and this level of information is considered to be appropriate to the current stage.

1.1.3 The Background Technical Paper provides information on the requirements for different site types, their sizes and typical activities/facilities within the sites.

1.1.4 Each site suitability report considers a particular site on its own merits. In addition, an engineering options report was produced. Information from both of these reports will feed into the technical assessment of how well the site may fit in with tunnel design options, ensuring combinations of sites spread across the length of the tunnel route provide a reasonable spatial distribution of sites (that will best assist with the construction of the tunnel, operation and maintenance). This is considered in the Preferred Scheme Report.

1.2 Background

1.2.1 The process for selecting sites is set out in the Site Selection Methodology (May 2009) paper. All sites have previously passed through the following parts of Stage 1:

- Part 1A - Creation of the long list of potential shaft (and CSO) sites
- Part 1B - Creation of a short list of potential shaft (and CSO) sites
  - Table 2.2: Long list of shaft (and CSO) sites - an assessment against set considerations and values
  - Table 2.3: Draft short list of shaft (and CSO) sites - assessment against a list of detailed considerations
  - Workshops to consider each site to arrive at a short list of sites.

1.2.2 The final part of Stage 1 includes this report. The following is an overall summary of all elements that apply to all the sites on the final short list:

- Part 1C - Creation of the Preferred List of shaft (and CSO) sites - site data, site visits, site suitability reports, engineering options report and optioneering workshops that will result in the Preferred Scheme Report.

1.3 Consultation

1.3.1 The Thames Water project team held meetings with London local authorities, statutory and other stakeholders to review the provisional short list of shaft and CSO sites. All general and site specific comments can be found in a separate report titled Consultation on the Short List of Sites: Consultation Feedback Report. These comments were considered to help determine the final short list of sites, but they were also considered at the optioneering workshops.

1.3.2 Further meetings were held with London local authorities, statutory and other stakeholders between January and March 2010. Comments are included in this report.
2 SITE INFORMATION

2.1 Site and surroundings

2.1.1 This section provides an overview of all the site information that will be used by one or more disciplines to assess the site in sections 3 to 9 of this report.

2.1.2 Site S76HF comprises public open space to the south of Imperial Wharf, located in the London Borough of Hammersmith and Fulham. Existing access to the site is taken from Townmead Road and Imperial Crescent. A site location plan is attached as Appendix 2.

2.1.3 The site comprises a new park associated with a recently completed, high density residential development, also known as Imperial Wharf. The park consists of large grassed and planted areas, a large pond and fountain feature, seating and children’s play area.

2.1.4 The surrounding area is predominantly residential, made up of a mix of terraced and townhouse properties and modern apartment blocks.

2.1.5 The site is bounded to the north by residential apartment blocks of up to six storeys in height. Most apartments have their own balconies or terraces that have views of the river or the landscaped area.

2.1.6 The site is bounded to the east by the Thames Path and River Thames. To the south is Imperial Crescent, a number of residential townhouses and apartments (all up to three storeys in height) and a showroom building located in the southeast corner. Townmead Road runs along the western boundary, separating the site from two-storey terraced properties in Lindrop Street and Tynemouth Street.

2.1.7 The proposed location of the shaft is within approximately four metres of the side facade of the site showroom, which adjoins the southeast corner of the site. It is also approximately 32 metres from the front facade of residential flats within Arcadian House, which is located along Imperial Crescent to the south of the site. The proposed temporary working area is sited within two metres of the south facade of apartments within Byanan House which overlook the site from the north.

2.1.8 The site is covered by various planning and environment designations in the Hammersmith and Fulham Unitary Development Plan. All the mapped designations are shown on the planning and environment plans in Appendix 3.

2.1.9 Photographs of the site and surroundings, together with an aerial photograph of the site, are attached as Appendix 4.

2.1.10 Road access to the site is from Townmead Road. There is no rail network local to the site. Clapham Junction rail station, Fulham Broadway and Parsons Green tube stations are approximately 1.5km away. There are no existing wharfage/jetty facilities at the site. A transport plan for the site is attached as Appendix 5.

2.1.11 Third-party assets and significant utilities are listed below and are shown on the services and geology plan in Appendix 6:

- Multi-storey residential blocks immediately to the north of the site
- Building immediately to the south of the site
- Residential properties fronting Imperial Crescent
- River wall.

2.1.12 The locations of other third-party assets, such as BT and fibre optic communication cables, are to be confirmed by further studies and utility searches and may not be shown on the services and geology plan.

2.1.13 Information on the geology specific to this site can be found within the services and geology plan, which is in Appendix 6. This plan shows that the shaft would be founded in the London Clay.
2.2 Type of site

2.2.1 The site S76HF is being considered as an intermediate shaft site.

3 PROPOSED USE OF SITE – CONSTRUCTION PHASE

3.1.1 The proposed construction phase layouts for the shaft sites are located in Appendix 7 – Construction Phase Layout, and are based on a preliminary assessment.

3.1.2 The construction phase layout drawings are illustrative and show:
- the layout as an intermediate shaft site
- potential access points.

3.1.3 These drawings provide initial preliminary schematic layouts that have not been optimised. If the site proceeds to the next stage as a preferred site, construction phase layouts would be optimised to minimise impacts.

3.1.4 Drawings of typical activities associated with the shaft construction phase are provided in Appendix 7. Potential above ground construction features (dependent on shaft type) include:
- approximately 3m high hoarding around the site boundary
- welfare facilities, temporary structures, approximately 3m high
- grout plant, approximately 3 to 5m high, including silos
- mobile crane, approximately 30m high
- gantry crane, approximately 8m high.

3.1.5 Preliminary data associated with the construction phase are provided in Table 3.1

<table>
<thead>
<tr>
<th>Table 3.1 Construction phase data</th>
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<tbody>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>Length of construction period</td>
</tr>
<tr>
<td>Likely working hours, ie, (night/day/weekend)</td>
</tr>
<tr>
<td>Working days</td>
</tr>
<tr>
<td>Primary means of transporting excavated material away from site</td>
</tr>
<tr>
<td>Primary means of transporting materials to site</td>
</tr>
</tbody>
</table>

*There may be feasible opportunities to use barge transport.

4 PROPOSED USE OF SITE – OPERATIONAL PHASE

4.1 Operational requirements

4.1.1 The indicative operational phase layouts for the shaft sites are located in Appendix 8 – Operational Phase Layout, and are based on a preliminary assessment.

4.1.2 The generic elevations of structures shown on the operational phase layout are located in Appendix 8 and provide an illustration of typical examples of the permanent structures which are applicable to shaft sites.

4.1.3 The underground infrastructure at this site is likely to be made up of a shaft, double flap valve chamber and a 10m wide overflow culvert.

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*a It was anticipated that an overflow culvert would be required at shaft sites when the assessment in this report was undertaken. Although this was subsequently changed with overflow culverts no longer required at
4.1.4 The above ground infrastructure at this site is likely to comprise a ventilation column 10m\(^b\) high and 3m diameter, a ventilation building 5m x 15m x 5m high and a 20m x 10m top structure with openings. The top structure is to provide access and egress into the main shaft and flap valve chamber.

4.1.5 The top structures are envisaged to be finished at a level of 107m\(^c\) tunnel datum (TD) (7mAOD), and since the ground level mean value at this site is 104mTD (4mAOD), the top structures would be raised to approximately 3m above the current ground level. For further information on the generic layout of this top structure, refer to Appendix 8.

4.1.6 Hardstanding would be provided to the top structures. The site would be fenced.

4.1.7 Preliminary data associated with the operational phase are provided in Table 4.1.

<table>
<thead>
<tr>
<th>Level of inspections and maintenance and likely working hours, ie, (night/day/weekend) - frequency of visits</th>
<th>1 daytime visit every six months for electrical/instrument inspection. An additional 1 week maintenance period for tunnel/shaft inspection required per 10 years that could be night/day/weekend working.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of traffic movements</td>
<td>1 van visit every six months. An additional 1 week period of 2 to 10 movements per day (estimated several vans and 2 cranes) every 10 years.</td>
</tr>
</tbody>
</table>

4.2 Restoration and after-use

4.2.1 The portion of the site not occupied by the permanent works would be restored to its original condition on completion of the construction works. If any buildings were demolished, these would not be reinstated unless required.

5 ENGINEERING ASSESSMENT

5.1 Access

5.1.1 This section should be read in conjunction with Section 7.2.

Road

5.1.2 Access to site for both the construction and operational phases would be from Townmead Road, a traffic calmed road approximately 8m wide.

Rail

5.1.3 Clapham Junction rail station, Fulham Broadway and Parsons Green tube stations would be less than 1.5 km away.

all sites, the assessment was not revised as it was considered that the difference would not change any discipline’s conclusion on the suitability of the site.

\(^b\) It was anticipated that the ventilation column at shafts sites would be 10m high when the assessment in this report was undertaken. Although this was subsequently changed to 15m high, the assessment was not revised as it was considered that the difference would not change any discipline’s conclusion on the suitability of the site.

\(^c\) It was anticipated that the elevation of top structures at both CSO and shaft sites would be finished at 107mTD when the assessment in this report was undertaken. Although this was subsequently changed to 104.5mTD, the assessment was not revised as it was considered that the difference would not change any discipline’s conclusion on the suitability of the site.
River

5.1.4 Material movement for an intermediate shaft site would likely be by road. However, as the site is adjacent to the river, there may be feasible opportunities to use barge transport.

5.2 Construction works considerations

5.2.1 This site would not require any demolition.

5.2.2 Battersea Railway Bridge would be approximately 300m from the assumed shaft position. The location of the shaft is such that the tunnel alignment would be as far as possible from the residential buildings located at the north end of the site.

5.2.3 Data available on third-party assets and significant utilities show that the main items of concern in this area are the proposed National Grid cable tunnel, which runs approximately under Townmead Road (remote from the shaft location), the multi-storey residential blocks immediately to the north of the site, the detached building immediately to the south of the site, and the river wall. Construction methods would be adopted, as appropriate, to mitigate potential settlement of these assets.

5.2.4 The shaft location is close to the river and therefore, the deviation of the tunnel alignment from the centre of the river would be minimised.

5.2.5 It is likely that the proposed works can be constructed within the overall construction programme.

5.3 Permanent works considerations

5.3.1 The top structure would be 2m above ground level.

5.4 Health and safety

5.4.1 There are no unusual health and safety issues with this site.

6 PLANNING ASSESSMENT

6.1 Introduction

6.1.1 The planning assessment builds on the advantages and disadvantages reported in Table 2.3 and covers the following areas:

- Planning applications and permissions
- Planning context
- Planning comments.

6.2 Planning applications and permissions

6.2.1 An initial desktop search of the London Borough of Hammersmith and Fulham online planning applications database identified numerous planning applications submitted and approved within the last five years applicable to this site and the wider Imperial Wharf area for significant mixed-use development. Site S76HF is the area of public open space and riverside walk referred to in the planning application below.

6.2.2 An outline planning application (reference 1998/00407/OUT) was approved in May 2000 for mixed-use development comprising 1,665 residential units, 15,564 square metres of (B1) floorspace, 6,217 square metres of A1/A2/A3 floorspace, 2,158 square metres of community use (D1), 6,284 square metres of hotel (C1), 3,132 square metres of health and fitness club and 480 square metres of river related uses, public open space and riverside walk, together with parking spaces, landscaping and access road.

6.2.3 Following the approval of this application, a raft of reserved matters and conditional detail planning applications have been submitted and approved.
6.2.4 The river frontage adjacent to the site is also proposed for new mooring facilities. Under planning application 2008/02682/FUL, extension to the approved moorings at Imperial Wharf was granted consent in December 2008, to incorporate a 132-metre extension to the berthing pontoon to bring the total length of moorings to 317 metres.

6.3 Planning context

6.3.1 The current planning policy context for the site is provided from the saved September 2007 policies from the Hammersmith and Fulham Unitary Development Plan, adopted August 2003. Several planning designations and policies from this development plan are applicable to the site and detailed below.

6.3.2 Policy EN31X, Thames Policy Area, covers the majority of the site and requires all built development to be of a high-quality design that respects the riverside location and contributes to its surrounding environment.

6.3.3 Policy EN2, Conservation Areas – the site is located within the Sands End Conservation Area. Policy EN2 requires all development to preserve or enhance the character or appearance of the conservation area, paying particular attention to the historical context, quality of design, scale, bulk, massing and materials.

6.3.4 Policy EN27, Nature Conservation Areas – the site is adjacent to the River Thames, which is designated along its entire stretch. This policy protects nature conservation sites from development that does not contribute to the physical, social and economic regeneration objectives of the UDP or that may result in harm to wildlife value.

6.3.5 The site is a newly-formed area of public open space which has been laid out in association with the Imperial Wharf development. The site is therefore not currently designated as public open space on the council’s proposals map; however, it is within an area of open space deficiency and the following policies are likely to be applicable:

6.3.6 Policy EN23, New Open Space Provision in Connection with Development, states that new development required to make provision of open space will need to meet the needs of the occupiers and users and, in respect of residential development open space, provision will need to be in accordance with development standards S5A and S7. Development proposals within areas of open space deficiency are expected to include open land provision beyond that required to meet the needs of the development itself.

6.3.7 Policy EN22X, Public and Private Open Space of Local Importance, states that in the case of public or private open space that is not identified on the proposals map, development will not be permitted where such land, either individually or cumulatively, has local importance for its open character or as a sport, leisure or recreational facility, or for its contribution to local biodiversity or visual amenity, unless the proposed development would release a site for built development needed to realise a qualitative gain for the local community in pursuance of other physical social and economic objectives of the UDP, and would provide for relocation of the open space to a site in the locality which is at least equivalent in size, quality, accessibility, usefulness and attractiveness to that being lost.

6.3.8 Policy EN21, Environmental Nuisance – the site is in proximity to existing residential properties, and this policy seeks to ensure that no undue detriment occurs to general amenities.

6.4 Consultation comments

6.4.1 A series of consultations on the shortlisted sites were held with London local authorities, statutory and other pan-London stakeholders during July to September 2009 and January to March 2010. This section summarises factual comments that have been made by consultees, and which have informed the SSR assessments.

London Borough of Hammersmith and Fulham

6.4.2 The council stated that the Imperial Wharf Park is privately owned and managed. It has recently been renovated and reopened in 2009. The provision of a large park was a main
objective of planning obligations for the area. There are therefore concerns over the loss of the park. The river walk has not been adopted as it is privately owned.

**English Heritage**

6.4.3 English Heritage advised that there are archaeological issues associated with the site. However, it is noted that the site has been heavily industrialised and so it is less likely for an archaeological issue to arise that would pose as a barrier to development. A desk-based assessment, including a modern disturbance plan, would be the next step if the site is taken forward.

**Environment Agency**

6.4.4 The Environment Agency advised that an application for a new mooring has been granted planning permission and is to be built. It extends to just outside the intertidal area. There are concerns about more jetties/wharves due to available space. Imperial Wharf is located near the site.

**Port of London Authority**

6.4.5 The Port of London Authority (PLA) stated that a large marina is planned to be developed to the north of the site; however, this has not yet happened. The PLA advised that once the marina has been developed, there would be a conflict between barges and the marina. The current berth onsite is short and would probably only fit one x 1000 tonne barge in at any one time. The PLA advised that it may have concerns regarding the possibility of extending further than the width of the site out into the river. The Thames towpath runs along the length of the site. The site is considered possible, but difficulties would occur with dredging along this whole area (up to site S13RD). Mitigation would be required and this would need to be assessed on a site-by-site basis.

**Transport for London**

6.4.6 The network assurance team would seek confirmation of construction traffic, construction traffic routes and possible traffic management requirements. The site is located near to the strategic road network – Wandsworth Bridge Road and the TLRN. Works would need to be co-ordinated as early as possible with other planned works/events on the network in the area and the neighbouring London Borough of Wandsworth. Residential properties are in close proximity to the site and noise considerations may lead to working hour restrictions by the local authority.

**Other statutory consultees**

6.4.7 No comment.

**6.5 Planning comments**

6.5.1 There are a number of planning designations that are applicable both on and adjacent to the site. These designations have been identified and described in Section 6.3 and of these designations, those relating to public open space and heritage are of most relevance to the proposed development, as well as residential amenity considerations.

6.5.2 The site is within a predominantly residential area. The closest residences are within approximately 2m of the construction working areas. It is considered that this separation distance is not sufficient in terms of safeguarding residential amenity from potential adverse construction impacts and in particular, given that this distance is applicable to the principal facade of a residential building which overlooks the site. To reduce impacts on amenity, the internal working layout of the site would need to be rearranged. This would not only increase separation distances but could also create a link from Townmead Road, through the park to the river frontage, which would be cut off under the initial proposed layout arrangement.
6.5.3 In addition, a control of site operation hours may be required due to the proximity of residential properties. These hours typically include 8am to 6pm during weekdays, 9am to 1pm on Saturdays and not at all Sundays.

6.5.4 Use of this site would result in the temporary loss of an area of public open space. The park is located within an area of public open space deficiency and although the loss would be temporary, it is likely that, based on the longevity of the works, the LPA would require the reprovision of open space within the locality, in accordance with Policy EN22X. The reprovision of public open space during the construction period is likely to be difficult, given an existing deficiency within the area. Mitigation measures would also be required to ensure the remaining areas of the park could continue to be used by existing users during the construction period, and are not unacceptably impacted upon by associated impacts such as noise, dust and traffic movements.

6.5.5 Further investigation would also be required to determine any potential impact or conflict of uses between the construction works and the proposed mooring facilities, which are located adjacent to the site, within the foreshore of the River Thames.

6.5.6 With appropriate mitigation, the construction works themselves and remaining top structures should also not result in overly prominent development in this location and should not unacceptably obstruct local views within the Thames Policy Area. The design of the remaining legacy structures would also require consideration to ensure they do not result in inappropriate development in this location and do not impede the use of the site for public recreation purposes.

6.5.7 The site is located wholly within the Sands End Conservation Area and although use of the site would not result in the loss of buildings and/or built features, loss of an attractive area of open space and trees may impact on the character and appearance of the conservation area, and appropriate mitigation may be required. The potential impact on character and appearance of the associated after-use top-structures should be reduced with mitigation and detailed design considerations. Detailed heritage considerations can be found in Section 7.

7 ENVIRONMENTAL APPRAISAL

7.1 Introduction
7.1.1 The following sections summarise specialist assessments which are provided in Appendix 9 – Environmental Appraisal Tables.

7.2 Transport
7.2.1 The site is suitable as an intermediate shaft site, as road and rail access routes are suitable for HGVs, with few notable constraints identified at this stage. To enable access to the TLRN, traffic calming (a raised table) on Townmead Road is likely to require removal. To enable site access, the construction of the access and temporary traffic signals at the junction between Townmead Road and Tynemouth Street would be required. Some on-street parking bays on Townmead Road may need to be displaced, should they be found to potentially restrict the turning movements of construction vehicles accessing the site. However, alternative parking is likely to be available nearby.

7.2.2 The potential for the workforce to access the site by public transport is low. However, parking for the workforce could potentially be allocated within the site boundary, or workforce transport may need to be provided.

7.3 Archaeology
7.3.1 On the basis of the information currently available, the site is less suitable as an intermediate site, as archaeological material associated with the medieval settlement of Fulham may be located within the proximity, although current records do not provide evidence to confirm this. However, due to a lack of previous investigations in the area, the nature and extent of archaeological receptors cannot be confidently predicted at this stage.
and it is possible that archaeological receptors of high or medium value may be present within the site.

7.4 Built heritage and townscape

7.4.1 The site is less suitable as an intermediate site because the development has the potential to result in adverse impacts upon the Sands End Conservation Area, the character of the River Thames, and local views. Mitigation in the form of a high-quality scheme design and possible screening is likely to be required to minimise impacts to the character of the Thames and local views, and to enhance or preserve the character or appearance of Sands End Conservation Area. Further mitigation would be required to minimise adverse impacts upon the newly-created green space and views from adjacent residences, although due to the height of these properties, adequate mitigation is likely to be difficult to achieve.

7.5 Water resources – hydrogeology and surface water

7.5.1 In terms of hydrogeology, the site is suitable because the intermediate shaft is to be constructed in London Clay (non-aquifer). The Chalk piezometric head is likely to be approximately 7.08m above the base of construction and should be taken into account in the engineering design. No impact on the Chalk aquifer is expected. Superficial deposits at the site comprise alluvium, which is classified as a minor aquifer, and which is likely to be subject to a limited impact on flow due to the use of a diaphragm wall or caissons.

7.5.2 In terms of surface water resources, this site is suitable because there is no direct pathway for pollution to the Thames, and management of drainage (behind Thames flood defences) to prevent pollution is likely to be feasible.

7.6 Ecology

7.6.1 The site is suitable as an intermediate site as few sensitive ecological receptors have been identified at this stage, with the exception of some potential for nesting birds, and adverse impacts are therefore likely to be minimal. The construction of an overflow culvert in the River Thames is likely to require negotiation with the EA and may require compensatory habitat provision and post-works restoration.

7.7 Flood risk

7.7.1 The site is suitable as an intermediate site as it is defended from flooding from the River Thames to the one in 1,000-year flood level, and the underlying geology and available space on the site is likely to be suitable for infiltration SuDS.

7.8 Air quality

7.8.1 The site is less suitable for use as an intermediate shaft site, as there is potential for fugitive emissions of dust during construction to have a perceptible impact at residential receptors closest to the site. These impacts could be reduced with standard dust control measures. There is potential for HGV movements on the local road network to cause localised air quality impacts; however, this could be mitigated by minimising the movement of HGVs during peak hours.

7.9 Noise

7.9.1 This site is less suitable as an intermediate site, due to the proximity of the residential receptors to the north and south. Any shielding afforded by the site perimeter barriers would be largely ineffectual, due to the height of these receptors. The proximity of the access road to the receptors to the north of the site, and the anticipated number of HGVs using this route, is likely to result in adverse noise conditions at those locations.
7.10  **Land quality**

7.10.1 The site is less suitable as an intermediate site as it has been developed for previous industrial use, namely asphalt works and plastic goods manufacture, with offsite potentially contaminating activities including gas works. The identified sources of contamination may impact on site workers and adjacent human receptors through direct contact/vapour inhalation exposure pathways.

8  **SOCIO-ECONOMIC AND COMMUNITY ASSESSMENT**

8.1  **Socio-economic profile**

8.1.1 The site is within the Sands End ward. The area has a mixed population with a range of ages, ethnic backgrounds and economic conditions represented.

8.1.2 As the Imperial Wharf development is as yet unoccupied, there is no data available on the socio-economic makeup of the site’s immediate neighbourhood.

8.2  **Issues and impacts**

8.2.1 The park in the Imperial Wharf residential development was opened to the public once all landscaping work was completed. Due to the proposed location of the engineering works, however, it appears likely that the majority of open space on the site would be lost during the works. The permanent structure remaining would also be likely to affect the use of the open space by residents of Imperial Wharf, as well as members of the wider community using the gardens and riverside access.

8.2.2 The Imperial Wharf residents, the flats adjacent to the south of the site and the terraced houses opposite the site to the west may experience disruption.

9  **PROPERTY ASSESSMENT**

9.1  **Introduction**

9.1.1 The area identified as a potential intermediate shaft site is part of a larger area of open space between Townmead Road and the River Thames. No inspection of the property has been undertaken for the purpose of preparing this property assessment and maps, plans and aerial imagery have been relied upon.

9.1.2 Planning enquiries reveal details of the planning permissions relating to the development of Imperial Crescent immediately to the south of the site and Imperial Wharf immediately to the north. The site forms part of the open space provided as part of the Imperial Wharf development.

9.2  **Crown Land and Special Land comments**

9.2.1 The site does not include Crown Land or Special Land within the meaning of the Acquisition of Land Act 1981.

9.3  **Land to be acquired**

9.3.1 The compensation assessment assumes that the working areas would be acquired temporarily via the acquisition of new rights for the period of the works stated in the engineering section above. A smaller area would need to be acquired permanently for the operational works, measuring approximately 45m by 35m, and located in the south-eastern corner of the site.

9.3.2 No rights of way or easements have been included in our assessment of this site acquisition cost. Access would be taken from Townmead Road.
9.4 Property valuation comments

9.4.1 The referencing exercise has revealed a freeholder and over 300 leaseholders, presumably within the residential blocks forming Imperial Wharf. While it is not clear which ownerships relate to the proposed site and which to the adjoining residential units, it does not appear that the local authority has any interest in the site.

9.4.2 As the site is open space, there is no prospect of it being developed in the foreseeable future.

9.4.3 It is understood that the land would be reinstated after the works are complete as a part of the engineering work and therefore reinstatement costs are not included in the compensation assessment.

9.4.4 Compensation would be assessed on a diminution in value basis for the new rights (temporary occupation during works, access rights during works, access rights for operational purposes) and on a market value basis for the permanent acquisition.

9.5 Disturbance compensation comments

9.5.1 As the site is currently open space, no disturbance costs are anticipated.

9.6 Offsite statutory compensation comments

9.6.1 There should be limited potential for offsite statutory compensation under Section 10 of the Compulsory Purchase Act 1965, as there is unlikely to be any physical interference with public or private property rights.

9.6.2 There should also be limited potential for claims under Part 1 of the Land Compensation Act 1973 Part 1, as the completed works are unlikely to emit 'physical factors', such as noise, vibration, smell, fumes, smoke, artificial lighting and discharge of solids or liquids, which may cause a diminution in value to property.

9.7 Site acquisition cost assessment

9.7.1 The statutory acquisition costs are likely to be relatively low and therefore acceptable.

10 SITE CONCLUSIONS BY DISCIPLINE

10.1 Introduction

10.1.1 The conclusions presented in this section are drawn from each discipline’s assessment, and are designed to inform the workshop where a final conclusion on whether the site moves forward as one of the preferred sites or not.

10.2 Engineering

10.2.1 This site is suitable as an intermediate shaft site because it is a large area with good road access and would not require any demolition.

10.3 Planning

10.3.1 This site is considered less suitable as an intermediate shaft site.

10.3.2 Site S76HF is the subject of a number of onsite and adjacent sensitive receptors, such as public open space, a conservation area, a nature conservation area and residential properties. It is considered that the current proposed layout of the construction works would not provide a sufficient separation distance from residential properties, and a rearrangement of the site layout would be required to increase the separation distance and to also create a link from Townmead Road, through the site to the river frontage.

10.3.3 Further to this, mitigation related to potential impacts on the conservation area and nature conservation area may also be required.
10.3.4 Use of site S76HF would result in the temporary loss of a public open space facility for a considerable period of time. Loss and disruption to this facility is a particular concern, given that the park is located within an area of public open space deficiency. It is also likely that the LPA would require the reprovision of lost facilities within the locality, which could be problematic.

**10.4 Environment**

10.4.1 Overall, the site is considered to be **less suitable** as an intermediate shaft site.

10.4.2 The site is considered **suitable** from the perspectives of transport, water resources, ecology and flood risk.

10.4.3 The site is considered **less suitable** from the perspectives of archaeology, built heritage, townscape, air quality, noise, and land quality.

10.4.4 Overall, the site is considered **less suitable**, and further investigation would be required as to whether archaeology, built heritage, townscape, air quality, noise, and land quality impacts could all be adequately mitigated. Likely mitigation considerations would include:

- Built heritage and townscape – further research to determine whether mitigation could effectively reduce adverse impacts on the Sands End Conservation Area, the character of the River Thames and local views to an acceptable level. Adequate new planting is likely to be important to protect visual amenity and reinstate the view of the recently developed park.

- Archaeology – further investigation to more accurately determine archaeological risk, specifically in relation to archaeological material associated with the medieval settlement of Fulham.

- Air quality – measures to ensure dust is adequately mitigated for the closest receptors

- Noise – standard noise barriers are unlikely to be entirely effective and other techniques may be required to reduce construction noise to acceptable levels

- Land quality – any required remediation of contamination (at this high risk site) and/or measures to ensure no mobilisation of contaminants retained in situ.

**10.5 Socio-economic and community**

10.5.1 This site is **not suitable** as an intermediate shaft site, as Imperial Wharf residents and the wider local community stand to temporarily or permanently lose the partial or total use of a riverside landscaped open green space.

10.5.2 If the site is used, mitigation is likely to involve addressing disruption to high-density residential developments adjacent to the north, south and west of the site, which may be potential sensitive receptors to the use of the site.

**10.6 Property**

10.6.1 The site is considered to be **suitable** as an intermediate shaft site from a property perspective.

10.6.2 The advantages of this site are that it is undeveloped and the acquisition cost should be acceptable.
APPENDIX 1 – SOURCES OF INFORMATION

Engineering

- Traffic Management and Access Roads/Rail – Scott Wilson
- Access River – BMT
- Third Parties (Shafts/CSOs) – Mott MacDonald and AECOM
- Geology – Thames Water
- Utilities – Thames Water and AECOM
- Construction and Operational Layout Template – London Tideway Tunnels.
- Background Technical Paper – London Tideway Tunnels

Planning

- London Borough of Hammersmith and Fulham online planning applications database
- Saved policies in the *Hammersmith and Fulham Unitary Development Plan*, adopted in August 2003

Environment

Transport

- Map of Transport for London Road Network (TLRN) - www.tfl.gov.uk
- Bus Route Maps: North-east, north-west, south-west, south-east - www.tfl.gov.uk
- Crossrail Plans - www.crossrail.co.uk/crossrail-bill-documents
- PTAL scores - Obtained from Table 2.3 information
- Thames Path map - www.walklondon.org.uk
- Capital Ring - www.walklondon.org.uk
- Cycle Routes - www.sustrans.org.uk and Local Cycling Guides 1-14
- Design Manual for Roads and Bridge TD 42/95, Highways Agency

Built heritage and townscape

- Hammersmith and Fulham list of Conservation Areas
- Hammersmith and Borough list of Open Spaces
- National Monuments Record - for some additional information regarding registered historic parks and gardens
- Unitary development plans
- Local authority websites
- Bing maps

Water resources – hydrogeology and surface water

- Environment Agency abstraction licence details
- Environment Agency groundwater levels
- Local authority details of unlicensed abstractors
- Envirocheck
Ecology
- Multi-Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk - statutory designated sites
- London Wildweb - http://wildweb.london.gov.uk - non-statutory site of importance for nature conservation
- National Biodiversity Network - http://searchnbn.net - distribution of protected species
- Google Maps - aerial views of habitat features
- BAP habitats - www.natureonthemap.org.uk
- Priority habitats and species on national and local scales - www.ukbap.org.uk

Flood risk
- Envirocheck

Air quality
- Local authority websites
- www.londonair.org.uk/london/asp/default.asp?la_id=&showbulletins=&width=1680
- www.airquality.co.uk

Noise
- Envirocheck - Identification of receptors
- Promap - Calculation of distances between site and receptors
- Multimap - Aerial photography – www.multimap.co.uk
- Defra noise maps - Identification of existing noise levels

Land quality
- Google Maps/Earth
- Site walkover information

Socio-economic and community
Not applicable.

Property
- Multi-map
- Mouchel referencing data
APPENDIX 3 – PLANNING AND ENVIRONMENT PLANS

GIS data could not be obtained from London Borough of Hammersmith and Fulham (see section 6.3 for planning context)
APPENDIX 4 – PHOTOGRAPHS OF THE SITE AND SURROUNDINGS
View of the site looking east from Townmead Road.

View of the site looking northeast from Imperial Crescent close to Greensward House.
View of the site looking east from Imperial Crescent towards the River Thames and residential buildings located on the opposite side of the river.
APPENDIX 5 – TRANSPORT PLAN
APPENDIX 6 – SERVICES AND GEOLOGY PLAN
APPENDIX 7 – CONSTRUCTION PHASE LAYOUT
APPENDIX 8 – OPERATIONAL PHASE LAYOUT
Ventilation Building (Shafts)

Ventilation Tower (Shafts)

Diagrammatic representation of top structure above main and intermediate shafts.
## APPENDIX 9 – ENVIRONMENTAL APPRAISAL TABLES

<table>
<thead>
<tr>
<th>Transport</th>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to road network</td>
<td>Site accesses onto Townmead Road from the private gardens at Imperial Wharf. The proposed site access is opposite the junction between Townmead Road and Tynemouth Street. On street parking in the vicinity of the site access may affect the turning movements of construction vehicles. Townmead Road is subject to a 30mph speed limit, is street lit and traffic calmed (raised table). It has a carriageway width of 7.8m and contains on street parking (reducing effective carriageway width to 6m). Some parking spaces will require removal if found to affect the turning movements of construction vehicles using the site access. Visibility splays in both directions from the site access are achievable to 90m. Access to the A3205 (TLRN strategic highway network) along Townmead Road onto and across Wandsworth Bridge. The route runs through a residential area. There are no visible restrictions over Wandsworth Bridge. Distance to TLRN 1.3km. See Transport Access Plan in Appendix 5.</td>
<td>Removal of some on street parking bays on Townmead Road will be required. Alternative residential parking available within vicinity of site for displaced parking. Conclusion: Road access to site likely to be suitable for HGVs, although traffic calming (raised table) on Townmead Road may require removal for accessing the TLRN (A3205). Some on street parking will also need to be removed if found to restrict the turning movements of construction vehicles using the site access. Access route to the TLRN (A3205) passes through a residential area and over Wandsworth Bridge with no visible restrictions.</td>
<td></td>
</tr>
<tr>
<td>Access to river</td>
<td>Located directly adjacent to river. Intermediate shaft site – river access not essential as road will be used to transport excavated material to main shaft site.</td>
<td>River access not required. Excavated material will be transported away by road.</td>
<td></td>
</tr>
<tr>
<td>Access to rail</td>
<td>Access to existing railway sidings at Clapham Junction uses the same route to the TLRN (A3205) and continues across the gyratory between the A217 and A3205 onto the A214. The route then leads onto East Hill following onto St John’s Hill before turning onto Plough Road for the Clapham Junction,</td>
<td>Route to possible rail link at Clapham Junction possible. Route runs through a high street area along St John’s Hill and under a rail bridge with no visible restrictions in addition to the constraints encountered upon accessing the TLRN</td>
<td></td>
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</table>
### Transport

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<tbody>
<tr>
<td>Traincare Depot railway sidings. The route contains the same constraints as the route to the TLRN (A3205), in addition to passing through a high street area along St John’s Hill. There are no visible restrictions under the rail bridge on Trinity Road. Distance 2.7km to rail access point from shaft site.</td>
<td></td>
<td>(A3205). Clapham Junction railway sidings at the Traincare Depot accessible using Plough Road.</td>
</tr>
<tr>
<td>Parking</td>
<td>Parking to be provided within the site boundary for workforce. Parking is available on Townmead Road and Tynemouth Street for pay &amp; display users Mon-Sat 9:00-17:00 at £1.80/hr for a maximum 8hrs (unlikely to be suitable for workforce).</td>
<td>Up to ten on street parking spaces will require removal to allow construction vehicles access to the site. Alternative parking for displaced spaces is provided on Townmead Road and surrounding roads such as Tynemouth Street. Parking for workforce could be provided within site boundary.</td>
</tr>
<tr>
<td>Public transport accessibility</td>
<td>PTAL 1-2, as identified within Table 2.3.</td>
<td>PTAL least suitable. Public transport access issues for workforce. Workforce transport could be provided.</td>
</tr>
<tr>
<td>Traffic Management</td>
<td>Removal of on street parking on Townmead Road will be required in order to accommodate HGV access. Traffic calming (raised table) on Townmead Road may also need to be removed. A new site access will need to be constructed. Temporary traffic signals will be required at the junction between Townmead Road, Tynemouth Street and site access during the construction of the site.</td>
<td>Traffic management in the form of removal of traffic calming (raised table), constructing the new site access and during the construction of the site in the form of traffic signals at the junction between Townmead Road, Tynemouth Street and site access. On street parking will also require removal with alternative residential parking available within close vicinity.</td>
</tr>
</tbody>
</table>
## Transport

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<tr>
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</table>

**Summary:** The site is suitable as an intermediate shaft site, as road and rail access routes are suitable for HGVs, with few notable constraints identified at this stage. To enable access to the TLRN, traffic calming (raised table) on Townmead Road is likely to require removal. To enable site access, the construction of the access and temporary traffic signals at the junction between Townmead Road and Tynemouth Street would be required. Some on street parking bays on Townmead Road may need to be displaced should they be found to potentially restrict the turning movements of construction vehicles accessing the site, however alternative parking is likely to be available nearby.

The potential for the workforce to access the site by public transport is low, however parking for the workforce could potentially be allocated within the site boundary or workforce transport may need to be provided.
## Archaeology

<table>
<thead>
<tr>
<th>Site considerations</th>
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<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designations, including Archaeological Priority Areas</td>
<td>No designations within the site boundary.</td>
<td>N/A</td>
</tr>
<tr>
<td>Summary of historical uses</td>
<td>The site appears to have undergone development from the early 20th century as a wharf and asphalt works, and was later in use as a depot. The site has since been cleared and currently has no structures on it.</td>
<td>A detailed desk based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td>Potential receptors of very high or high value with the potential to be directly affected</td>
<td>The GLSMR records that the site is within the medieval settlement of Fulham. The remains of a medieval settlement are likely to be considered as receptors of high value.</td>
<td>A detailed desk based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td>Potential receptors of medium value with the potential to be directly affected</td>
<td>No archaeological receptors are recorded within the area of the site. This does not preclude the possibility of unrecorded archaeological receptors of medium value being present within the site. Prehistoric, Roman and medieval find spots have all been identified in the vicinity of this site.</td>
<td>A detailed desk based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td>Other receptors with the potential to be directly affected</td>
<td>Dewatering of potential waterlogged deposits may be an issue considering the close proximity of the site to the Thames.</td>
<td>A detailed desk based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
<tr>
<td>Extent of existing disturbance (if known)</td>
<td>The site appears to have undergone extensive development which may have adversely impacted any archaeological material which may be present.</td>
<td>A detailed desk based assessment is required to sufficiently understand the archaeological resource and define risk to potential development.</td>
</tr>
</tbody>
</table>
| Potential issues | Detailed design proposals, and an outline method statement will be required to enable initial assessment of development impacts, and to inform mitigation proposals. With the currently available information it is not possible to highlight specific potential issues. However, the potential for remains associated with the medieval settlement of Fulham means that archaeological | Mitigation methods could include:  
- Desk based assessment  
- Production of deposits model  
- Archaeological monitoring of geotechnical investigations  
- Archaeological evaluation |
### Archaeology

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</table>
|                     | receptors of high value may well be present. | • Archaeological watching brief  
• Archaeological excavation. |

**Summary:** On the basis of the information currently available, the site is less suitable as an intermediate site as archaeological material associated with the medieval settlement of Fulham may be located within the proximity, although current records do not provide evidence to confirm this. However, due to a lack of previous investigations in the area the nature and extent of archaeological receptors cannot be confidently predicted at this stage, and it is possible that archaeological receptors of high or medium value may be present within the site.
### Built heritage and townscape

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
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</tr>
</thead>
</table>
| Designations including Conservation Areas, including trees | **Listed Buildings**  
There are no listed buildings within 250m of S76HF.  
**Locally Listed Buildings**  
Although the borough of Hammersmith and Fulham maintain a list of locally listed buildings, this data was not available at the time of this assessment.  
There are no locally listed buildings within 250m of the site within the borough of Wandsworth.  
**Conservation Areas**  
Sands End Conservation Area: 0m  
**Registered Historic Parks and Gardens**  
There are no Registered Historic Parks and Gardens within 250m of the development site.  
**Locally Listed Parks and Gardens**  
There are no locally listed parks and gardens or London squares within 250m of the development site.  
**Protected Views**  
There are no protected views within 250m site within the Borough of Wandsworth.  
Information on protected views is not currently for the Borough of Hammersmith and Fulham. | In the case of conservation areas, a high quality scheme design and adequate screening for the development will be required as discussed below.  
A detailed desk based assessment in conjunction with archaeology work will be required to inform likely development impact and to determine more detailed mitigation proposals. |

<p>| Potential receptors of medium to very high importance with the potential to be directly affected | The development site is located within Sands End Conservation Area and consequently there is the potential for the designated area to be directly affected. | Mitigation to enhance or preserve the character or appearance of Sands End conservation area would be required. This is likely to require a high quality scheme design and possible screening in order to mitigate against potential adverse impacts upon the |</p>
<table>
<thead>
<tr>
<th>Built heritage and townscape</th>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site considerations</td>
<td></td>
<td></td>
<td>designated area. Any trees that are on site would be protected by their location within the conservation area. Newly planted trees are present.</td>
</tr>
<tr>
<td>Other receptors of lesser importance with the potential to be directly affected</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Potential receptors of medium to very high importance with the potential to be indirectly affected</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Other receptors of lesser importance with the potential to be indirectly affected</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Sensitive landscape character areas likely to be affected, including trees and TPOs</td>
<td>Site in Thames Policy Area, in Conservation Area. Sensitive site on the north bank of the River Thames, surrounded by residences along Townmead Road to the north and Imperial Crescent to the south. Site developed into a park with trees, pond/fountain and new planting – to be opened in the Summer of 2009; hence, access to site was closed. Area closer to the River on the assigned site appears to have new shrub planting on it (as best seen from the photographs since access to site was not possible). The presence and operation of machinery, materials stores and buildings would potentially result in temporary, adverse direct impacts on the character of the new park and river frontage and temporary, adverse indirect impacts on neighbouring areas. Permanent elements would potentially have an adverse impact on the character of the park and planting within park.</td>
<td>Retention of trees where possible and protection in accordance with BS 5837. Introduction of landscape scheme to re-instate the park setting, including appropriate surface treatments and planting to relate to adjacent river frontage. Site has been developed into a park; hence, presence and operation of machinery, materials stores and buildings on site would potentially severely impact the character of the site and river frontage. This site is suitable only if the park setting is appropriately re-instated. Also, the temporary works would have to be contained to one corner of the site so as to keep maximum part of the park open and minimize impact on the character of the site. Permanent elements would need to be mitigated as listed above.</td>
<td></td>
</tr>
<tr>
<td>Potential views likely to be affected</td>
<td>Open views of the site from surrounding residential properties along Townmead</td>
<td>During construction, the use of hoardings and appropriate lighting would</td>
<td></td>
</tr>
</tbody>
</table>
### Built heritage and townscape

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Road and Imperial Crescent, the River, residences along the south bank of the River, and Chelsea Harbour Railway Bridge. Partially interrupted views from residences in Lindrop Street and Tynemouth Street. Permanent elements would be visible from Imperial Crescent and the River.</td>
<td>minimize visual impact. Design of top structure, vent column, and electrical kiosk to be given careful consideration. Planting to screen permanent plant and access to re-instate views of the park. Adequate new planting would be important to protect visual amenity and re-instate view of developed park.</td>
<td></td>
</tr>
</tbody>
</table>

| Particular considerations on sites where new permanent structures are required | The direct impact of permanent structures upon the Sands End Conservation Area would need to be considered. | The structures should be of a high quality design to ensure that they preserve or enhance the visual appearance of the Conservation Area in accordance with English Heritage Guidance and planning policy |

| Potential issues | The presence of a newly created green space and the site location within the Sands End Conservation Area are the main issues with this site. In light of the extensive planting, adjacent residential development and riverside walk, it is difficult to envisage how adequate mitigation could be achieved. | Some form of screening and/or high quality scheme design would be required to mitigate against any negative visual impact the scheme may have upon the built heritage receptors. |

**Summary:** The site is less suitable as an intermediate site because development has the potential to result in adverse impacts upon the Sands End Conservation Area, the character of the River Thames and local views. Mitigation in the form of a high quality scheme design and possible screening, is likely to be required to minimise impacts to the character of the Thames and local views, and to enhance or preserve the character or appearance of Sands End conservation area. Further mitigation would be required to minimise adverse impacts upon the newly created green space and views from adjacent residences, although due to the height of these properties, adequate mitigation is likely to be difficult to achieve.
### Water resources – hydrogeology and surface water

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
</table>
| **hydro-geological conditions (Groundwater and Surface Water)** From BGS Geological Model giving average ground condition profile. Local near surface conditions may vary, particularly within the river. | **Geology (thickness)**  
- Superficial Geology and Made Ground (5 m)  
- London Clay (42 m)  
- Lambeth Group (18 m)  
- Thanet sand (12 m)  
**Hydrogeology**  
- Piezometric Level: ~ -28 mAOD (~33 mbgl)  
**Groundwater Monitoring Location**  
- EA Hydrometry Sites: TQ27-159 - approximately 1.7 km southwest of the site (other side of the River Thames)  
**Watercourses**  
- Adjacent to River Thames | The shaft will be constructed to an invert level of approximately 40.08 mbgl therefore the shaft will be founded in the London Clay. Piezometric head in Chalk will be approximately 7.08 m above the base of the construction. |
| **SPZs and groundwater users** | **SPZ**  
- Not located in a Source Protection Zone  
**EA Licensed Groundwater Abstractions and Details**  
- No public water supply  
- 4 licensed abstraction borehole within 2 km radius  
**Licence Numbers:**  
1. 28/39/42/0071 (1 borehole)  
2. 28/39/39/0177 (2 borehole)  
3. 28/39/39/0157 (1 borehole)  
**Locations:**  
1. 920 m southwest of the site (other side of the River Thames)  
2. 1.55 km southwest of the site  
3. 860 m northeast of the site  
**Operator:**  
1. Hanson Quarry Prod Europe Ltd  
2. Trustees of the Hurlingham Club  
3. Circadian Limited  
**Abstracted Aquifer Unit:**  
1. Chalk  
2. Gravel  
3. Chalk | A simple volumetric approach has been used to calculate the catchment area of the abstraction borehole. A conservative mean annual recharge of 100mm/year was used to calculate a radius of 274 m for licence 1, 219 m for licence 2 and 851 m for licence 3. As a result, the shaft is not located within the catchment area. |
<table>
<thead>
<tr>
<th>Site considerations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Abstraction Purposes:</td>
<td><strong>Water resources – hydrogeology and surface water</strong>&lt;br&gt;&lt;br&gt;<strong>Site considerations</strong>&lt;br&gt;Abstraction Purposes:&lt;br&gt;1. Industrial, commercial and public service (mineral products-general use)&lt;br&gt;2. Industrial, commercial and public service (sports grounds/facilities-spray irrigation)&lt;br&gt;3. Production of energy (electricity-boiler feed)&lt;br&gt;&lt;br&gt;<strong>Abstraction Quantity (annual):</strong>&lt;br&gt;1. 23,515 m$^3$&lt;br&gt;2. 15,000 m$^3$&lt;br&gt;3. 227,300 m$^3$</td>
<td><strong>Local Authorities (LA)</strong>&lt;br&gt;Unlicensed Groundwater Abstractions and Details&lt;br&gt;• Information pending from Hammersmith and Fulham Council&lt;br&gt;• No abstraction borehole within 1 km radius inside Wandsworth Council Boundary&lt;br&gt;• No information provided for Kensington and Chelsea Council&lt;br&gt;&lt;br&gt;<strong>Borehole locations and depths</strong>&lt;br&gt;There are 18 historical records of water wells: 15 deep wells and 3 shallow wells within 1 km radius.&lt;br&gt;Depth range: 101.8 – 192.02 m.&lt;br&gt;Depth range: 6.8 – 9.1 m.</td>
</tr>
<tr>
<td>Potential impacts on surface water features</td>
<td>The site is located adjacent to the River Thames. The site is behind flood defences so the pollution risk is through drainage to the Thames.</td>
<td>Work needs to be undertaken in consideration of Pollution Prevention Guidelines – PPG1, PPG5 and PPS23.</td>
</tr>
<tr>
<td>Potential impacts on groundwater (resources and quality)</td>
<td>No impact on groundwater at depth is likely since the intermediate shaft is to be constructed in London Clay (non aquifer). At shallow depth, the shaft is located in Alluvium which is classified as a minor aquifer. Limited impact on shallow aquifer if water is excluded from the excavation by diaphragm wall or caissons.</td>
<td>See below (likely types of mitigation measures that will be required)</td>
</tr>
<tr>
<td>Likely types of mitigation measures that will be required</td>
<td>No mitigation required if groundwater is not impacted.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
## Water resources – hydrogeology and surface water

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Potential issues</td>
<td>The intermediate shaft to be excavated in London Clay but to be below piezometric head in Chalk. Potential pressure effects. Limited impact on flow in shallow aquifer.</td>
<td>Confined head in Chalk to be considered as part of geotechnical design. Impact on and mitigation for shallow aquifer will depend on construction design.</td>
</tr>
</tbody>
</table>

**Summary:** In terms of hydrogeology the site is suitable because the intermediate shaft is to be constructed in London Clay (non aquifer). The Chalk piezometric head is likely to be approximately 7.08m above the base of construction and should be taken into account in the engineering design. No impact on the Chalk aquifer is expected. Superficial deposits at the site comprise Alluvium which is classified as a minor aquifer, and which is likely to be subject to a limited impact on flow due to diaphragm wall or caissons.

In terms of surface water resources, this site is suitable because there is no direct pathway for pollution to the Thames and management of drainage (behind Thames flood defences) to prevent pollution is likely to be feasible.
## Ecology (terrestrial and aquatic)

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statutory designations</strong></td>
<td>No sites within 2km</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Non-statutory designated wildlife sites</strong></td>
<td>River Thames and Tidal Tributaries SMI lies immediately adjacent to site</td>
<td>The construction of an overflow culvert in the Thames is likely to require negotiation with the EA and may require compensatory habitat provision and post-works restoration. Dredging operations would require discussions with the EA.</td>
</tr>
<tr>
<td><strong>BAP priority habitats</strong></td>
<td>The site could be defined as constituting London BAP habitat 'Parks, Squares and Amenity Grassland'. The adjacent Tidal Thames is a London BAP habitat.</td>
<td>Loss of amenity grassland and ornamental trees and shrubs may require restoration but this is likely to be easily achievable. The construction of an overflow culvert in the Thames is likely to require negotiation with the EA and may require compensatory habitat provision and post-works restoration. Dredging operations would require discussions with the EA.</td>
</tr>
<tr>
<td><strong>Protected or otherwise notable species within the Study Area</strong></td>
<td>Although some habitat appears potentially suitable for reptiles, the site is isolated from sources of colonisation. A breeding bird survey may be required. No direct impacts on aquatic ecology receptors, although piling close to the river bank could result in impacts on fish in the River Thames.</td>
<td>Some limited mitigation (i.e. reinstatement of trees, shrubs and grassland) may be required but is likely to be easily achievable. Any construction in the Thames will require detailed aquatic invertebrate and fish investigation. Controls may need to be placed on piling operations close to the river bank. Negotiation with EA required.</td>
</tr>
<tr>
<td><strong>Potential issues</strong></td>
<td>No other issues.</td>
<td>No other issues.</td>
</tr>
</tbody>
</table>

**Summary:** The site is suitable as an intermediate site as few sensitive ecological receptors have been identified at this stage with the exception of some potential for nesting birds, and adverse impacts are therefore likely to be minimal. The construction of an overflow culvert in the Thames is likely to require negotiation with the EA and may require compensatory habitat provision and post-works restoration.
<table>
<thead>
<tr>
<th>Flood risk assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site considerations</strong></td>
</tr>
<tr>
<td>Flood Risk Zone</td>
</tr>
<tr>
<td>Assessment of conditions for SuDS</td>
</tr>
<tr>
<td>Potential issues</td>
</tr>
</tbody>
</table>

**Summary:** The site is suitable as an intermediate site as it is defended from flooding from the River Thames to the 1 in 1000 year flood level, and the underlying geology and available space on the site is likely to be suitable for infiltration SuDS.
### Air quality

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AQMA</strong></td>
<td>The air quality objective for NO₂ is exceeded on major roads in vicinity of site.</td>
<td>There is a need for more site specific data.</td>
</tr>
<tr>
<td><strong>Sensitive Receptors</strong></td>
<td>There are residential properties along Wandsworth Bridge Road (A217) and along the access route from the A217 to the site. There are residential properties within 10m of the proposed site.</td>
<td>There are relevant air quality sensitive receptors present along the route the construction traffic is likely to take and close to the proposed construction works.</td>
</tr>
<tr>
<td><strong>Existing traffic issues</strong></td>
<td>The main traffic issue in this area is exhaust emissions along the A217 corridor.</td>
<td>Additional vehicle emissions have a high potential to interfere with local air quality action plan policies.</td>
</tr>
<tr>
<td><strong>Existing sources of significant air pollutants</strong></td>
<td>See above.</td>
<td>See above.</td>
</tr>
<tr>
<td><strong>Notable gaps in existing air quality monitoring</strong></td>
<td>There is no data available at the likely access to A217 and the nearest existing data indicates existing AQLV are exceeded.</td>
<td>Collect a minimum of 6 months diffusion tube data at site access to A217 or other point of access to major road network.</td>
</tr>
<tr>
<td><strong>Potential issues</strong></td>
<td>The risk from additional exhaust emissions from construction HGVs is undefined at present. The risk from dust impacts is moderate.</td>
<td>Minimise HGV movements on the local road network during the peak hour. Standard dust control measures will minimise the effect of fugitive dust on nearby sensitive receptors.</td>
</tr>
</tbody>
</table>

**Summary:** The site is less suitable for use as an intermediate shaft site as there is potential for fugitive emissions of dust during construction to have a perceptible impact at residential receptors closest to the site. These impacts could be reduced with standard dust control measures. There is potential for HGV movements on the local road network to cause localised air quality impacts, however this could be mitigated by minimising the movement of HGVs during peak hours.
### Noise

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise band level (from Defra noise maps)</td>
<td>Information from Defra noise maps indicates daytime noise levels of up to 58 dB LAeq and nighttime noise levels of up to 50 dB LAeq at the closest residential properties to the south and north of the site. Information from Defra noise maps indicates daytime noise levels of up to 63 dB LAeq and nighttime noise levels of up to 55 dB LAeq at the closest residential properties to the west of the site. Existing noise levels at receptor locations to the west of the site are greater than those to the north and south of the site due to their proximity to Townmead Road. Noise levels from the Defra noise maps provide an indication of prevailing noise levels only, and will not be employed in any detailed assessments for chosen sites.</td>
<td>N/A</td>
</tr>
<tr>
<td>Sensitive Receptors</td>
<td>There are sensitive receptors in close proximity to the north, south and west boundaries of the site. To the west of the site, 2 storey residential properties line Townmead Road. To the south of the site 4 storey residential receptors exist on Imperial Crescent and to the north multi storey receptors overlook the site. These include Cyprus house, Box Tree House and Banyan House.</td>
<td>N/A</td>
</tr>
<tr>
<td>Existing traffic issues</td>
<td>Road traffic on Townmead Road to the west of the site is likely to dominate the existing noise climate in the area of the site.</td>
<td>N/A</td>
</tr>
<tr>
<td>Existing sources of significant noise emissions</td>
<td>Road traffic on Townmead Road to the west of the site is likely to dominate the existing noise climate in the area of the site. There are no railway lines or particular industrial noise</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Noise

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential issues</strong></td>
<td>Construction: The construction period is estimated at 4 to 5 years and working hours will be 24 hours per day Monday to Saturday. This has the potential to result in adverse noise impacts to the sensitive receptors surrounding the site. A relatively large number of daily HGV movements are anticipated. This number of vehicle movements is likely to result in adverse noise impacts upon receptors to the north of the site, in front of which the permanent access road is proposed. The site is quite large and, whilst the shaft location may be fixed, ancillary plant should be sited as far as is practicable from surrounding sensitive receptors. Proposed 3m site boundary fencing will provide useful noise mitigation to some plant and construction activities. Vibration resulting from general construction works is not anticipated to be significant. The nearest receptors to the proposed shaft location are at a distance of approximately 10 metres and there is potential for vibration levels to result in minor cosmetic damage and / or nuisance during shaft sinking. Vibration from tunnelling should be considered on a case by case basis at particular sensitive locations. Operation: With appropriate attenuation (if necessary), there is no reason why noise from the ventilation column and top chamber should result in significant noise impacts to nearby sensitive receptors.</td>
<td>Adherence to the good site practices provided in BS5228. Siting of noisy equipment and construction activities as far as is practicable from sensitive receptors. Provision of site boundary noise fences. Noisy construction activities, or activities which may cause vibration, be undertaken during daytime hours only to reduce the noise impact during nighttime construction.</td>
</tr>
</tbody>
</table>
**Noise**

<table>
<thead>
<tr>
<th>Site considerations</th>
<th>Comments</th>
<th>Mitigation required and conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary:</strong> This site is less suitable as an intermediate site due to the proximity of the residential receptors to the north and south. Any shielding afforded by the site perimeter barriers would be largely ineffectual due to the height of these receptors. The proximity of the access road to the receptors to the north of the site, and the anticipated number of HGVs using this route, is likely to result in adverse noise conditions at those locations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Land quality

<table>
<thead>
<tr>
<th>Site Location</th>
<th>Grid Reference: 526284, 176276</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Site Use</td>
<td>The Imperial Wharf site is a new park (green/open space) area within a new (apparently complete) residential development (Imperial Wharf). The site was not accessible (new development - not yet open) at the time of visit, however, from the boundary, extensive new planting of vegetation and trees was observed. The park includes a relatively large pond/fountain feature, seating, children’s play area and path area adjacent to the river.</td>
</tr>
<tr>
<td>Topography</td>
<td>The site is relatively level.</td>
</tr>
<tr>
<td>Field Evidence of contamination (i.e. visual/olfactory)</td>
<td>None observed.</td>
</tr>
<tr>
<td>Current surrounding land use (immediately adjacent to site)</td>
<td>Residential apartment blocks (up to 6 storeys) border most of the northern site boundary. A riverside walk area and the river are located to the East. The extent of the riverside walk could not be determined as the site was not accessible at the time of the visit. An access road, residential townhouses and some flats (both up to 3 storeys) border the majority of the south of the site. A showroom building is located at the SE corner of the site and Townmead road is adjacent to the west of the site, with two storey residential houses opposite the road.</td>
</tr>
</tbody>
</table>

### Geological and hydrogeological information

| Geological Strata\(^1\) | - Superficial Geology and Made Ground (5 m)  
- London Clay (42 m)  
- Lambeth Group (18 m)  
- Thanet sand (12 m) |
|-------------------------|--------------------------------------------------|
| Underlying Aquifer Classes | Non-Aquifer: London Clay  
Minor Aquifer: River Terrace Deposits, Lambeth Group, Thanet Sands, Harwich Formation  
Major Aquifer: Chalk |
| Groundwater Vulnerability/Soil Classification (High/Intermediate/Low/Not Applicable)\(^2\) | River Terrace Deposits - Minor Aquifer / London Clay – Non aquifer.  
High Leaching Potential of Soils (U)  
Note: Soil information for urban areas is based on fewer observations than elsewhere in the country. Therefore a worst case vulnerability (H) is assumed until proven otherwise. |
| Source Protection Zone Details | Not located in a Source Protection Zone (from Hydrogeology) |
| Surface Water Receptors | River Thames (directly adjacent to site) |

### Relevant information within a 250m radius of the site

| Historical Potentially Contaminating Activities (based on mapping data) | Onsite  
- Open land, riverside 1874 – 1880  
- Britannia Wharf 1896 – 1899  
- Trinidad Asphalt Works 1920 – 1949  
- Plastic goods 1938 |
### Land quality

<table>
<thead>
<tr>
<th>Activity</th>
<th>Distance and direction to site</th>
<th>Contaminants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made Ground</td>
<td>Onsite and directly adjacent to site.</td>
<td>Metals, TPH, PAHs</td>
</tr>
<tr>
<td>Asphalt works</td>
<td>Onsite and directly adjacent to site.</td>
<td>Metals, TPH, PAHs, PCBs, Solvents, Phenols,</td>
</tr>
<tr>
<td>Tanks – contents unknown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Offsite
- Open land 1874 – 1880
- Townmead Road (10m west) 1896 – present
- Britannia, Imperial, Regina and Shell Wharves/Transport Support and Cargo handling (directly adjacent to site) 1896 – present
- Numerous tanks to the west of the site (closest located directly adjacent to site) 1950 – 1989
- Factory/Works – unspecified (25m north) 1920 – 1987
- Imperial Biscuit Factory (50m north) 1920 – 1954
- Works - Gas Appliances (50m north) 1954
- Asphalt Works (80m west) 1896 – 1920
- Gas Industry Facilities (closest 85m north) 1950 – 1971
- Miscellaneous Power Facilities (135m south) 1971
- Numerous Electrical Substation (closest 145m southwest) 1950 – 1971
- Engineering Works (210m north) 1896

### Pollution Incidents to controlled waters
- Two
  - Oils – Unknown, Minor incident (205m south)
  - Miscellaneous – Unknown, Minor incident (245m north)

### Landfill Sites
- None

### Other Waste Sites
- Two Waste Transfer Sites:
  - Small (greater than 10,000T per year, less than 25,000T per year), license listed as lapsed/cancelled (160m north) 1991
  - Very large (exceeds 250,000T per year) license listed as lapsed/cancelled (240m north) 1982

### Registered Radioactive Substances
- None

### Fuel Stations/Depots
- None

### Contemporary Trade Directory Entries
- Three
  - Plastic goods (on site) 1938
  - Factory/works – use unspecified (25m north) 1920 – 1987
  - Transport support and cargo handling (140m south) 1920

### Site classification based on above information
### Land quality

| Potential Site Contaminants derived from off-site sources and transported to site | 1) Wharf Industry | 1) Closest directly adjacent to site.  
| | 2) Gas Works | 2) 50m north | 1) Metals, TPH, PAHs  
| | | | 2) Metals, , TPH, PAHs, PCBs, Solvents |

| Potential Contamination Pathways to Site  
(Conceptual Site Model)\(^3\) | Source 1: A1, A2, A3, B4 | Source 2: D6, E1, F7 |
| | Note: Refer to schematic Conceptual Site Model for explanation of site-specific source-pathway-receptors |

| Contamination Category | Category 3 – Assessed as High Risk |

**Summary:** The site is less suitable as an intermediate site as it has been developed for previous industrial use, namely asphalt works and plastic goods manufacture with off-site potentially contaminating activities including gas works. The identified sources of contamination may impact on site workers and adjacent human receptors through direct contact/ vapour inhalation exposure pathways.

**Notes:**

1. From BGS Geological Model giving average ground condition profile. Local near surface conditions may vary, particularly within the river.

2. Soil information for urban areas is based on fewer observations than elsewhere in the country. Therefore a worst case vulnerability (H) is assumed until proven otherwise.

3. Refer to schematic Conceptual Site Model for explanation of site-specific source-pathway-receptors
Contacts

For information about the Thames Tideway Tunnel
Call: 0800 0721 086 Lines are open 24 hours a day
Visit: www.thamestidewaytunnel.co.uk
Email: info@tidewaytunnels.co.uk

For our language interpretation service call 0800 0721 086

For information in Braille or large print call 0800 0721 086

For information about acceptance of our application and the examination process please contact the Planning Inspectorate.

Call: 0303 444 5000
Visit: http://infrastructure.planningportal.gov.uk