Appendix V – Greenwich Pumping Station

Introduction

V.1.1 This appendix sets out the site selection process that we used and our rationale for identifying our preferred phase one and phase two consultation sites to intercept the Greenwich Pumping Station CSO.

Type of site

V.1.2 We need a worksite to intercept the local combined sewer overflow (CSO), known as the Greenwich Pumping Station CSO, and to connect it to the main tunnel via a long connection tunnel. To enable the connection to be made, the site needs to be as close as possible to the line of the existing sewer. The long Greenwich connection tunnel will also connect the Earl Pumping Station and Deptford Storm Relief CSOs to the main tunnel.

Site selection process

V.1.3 All potential worksites have been identified in accordance with our Site selection methodology paper (SSM), which involved a ‘sieving’ approach, commencing with identification of all potentially suitable areas of land (excluding concentrated residential sites and World Heritage Sites) and passing these sites through increasingly detailed levels of assessment to move from a long list to a draft short list, a final short list and finally a list of preferred sites for phase one consultation.

V.1.4 A plan showing all the sites considered for the interception of the Greenwich Pumping Station CSO and how they progressed during the site selection process can be found in Annex V.1. Furthermore, all the sites considered for the Greenwich connection tunnel are shown in annexes V.2 and V.3.

Preferred site for phase one and phase two consultation

V.1.5 The table below identifies our preferred sites at phase one and phase two consultation to intercept the Greenwich Pumping Station CSO. Section V.2 of this appendix provides the details of how we identified our preferred phase one site. Sections V.3 to V.5 provide details of why we have the same preferred site for phase two consultation, but a different tunnelling strategy.

<table>
<thead>
<tr>
<th>Phase one consultation site:</th>
<th>Greenwich Pumping Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase two consultation site:</td>
<td>Greenwich Pumping Station</td>
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</tbody>
</table>
V.2 Site selection up to phase one consultation

Assessment of the long list sites

V.2.1 The long list of potential sites to intercept the Greenwich Pumping Station CSO was created by conducting a desktop survey of the land in the vicinity of the existing sewer.

V.2.2 In total, 13 sites were included on the long list. These sites were assessed having regard to the high-level considerations set out in Table 2.2 of the SSM (hereafter referred to as Table 2.2) including engineering (site size, site features, availability of jetty/wharf and access), planning and environment (heritage, landscape/townscape, open space and ecological) and community and property (neighbouring land uses, site use, Special Land/Crown Land and acquisition costs) considerations.

V.2.3 The table below provides a summary of the outcome of the Table 2.2 assessment in respect of the long list of sites considered for the interception of this CSO. Sites which were assessed as being the least constrained when considered against Table 2.2 considerations passed to the draft short list. This did not necessarily mean these sites would ultimately be judged as suitable, but that no significant constraints were identified in relation to the high-level considerations addressed at Table 2.2. Sites that were judged to be more constrained were not recommended to be retained on the draft short list for more detailed assessment. The main rationale for the exclusion of these sites at this stage is summarised in the table below.

Table V.1 Long list to draft short list for the interception of the Greenwich Pumping Station CSO (Table 2.2 assessment)

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/description</th>
<th>Recommendation and rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>C33XA</td>
<td>Greenwich Foreshore</td>
<td><strong>Recommendation:</strong> To draft shortlist</td>
</tr>
<tr>
<td>C33XE</td>
<td>Playground</td>
<td><strong>Recommendation:</strong> To draft shortlist</td>
</tr>
</tbody>
</table>
| C33XF   | Parking area adjacent Greenwich High Road | **Recommendation:** Not to draft shortlist  
**Rationale:** The site is too restrictive |
<p>| C33XG   | Parking to small industrial area | <strong>Recommendation:</strong> To draft shortlist |
| C33XH   | Greenwich Pumping Station | <strong>Recommendation:</strong> To draft shortlist |</p>
<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/description</th>
<th>Recommendation and rationale</th>
</tr>
</thead>
</table>
| C33XL  | Grass area fronting flats on Greenwich High Road | **Recommendation:** Not to draft shortlist  
**Rationale:** The site is too narrow so there is insufficient space to accommodate required construction works. |
| C33XM  | Gardens to Queen Elizabeth College | **Recommendation:** Not to draft shortlist  
**Rationale:** The site is too narrow so there is insufficient space to accommodate the required construction works. The engineering connection to the sewer is also long and difficult. |
| C33XN  | Garden area behind St Alfege Church | **Recommendation:** Not to draft shortlist  
**Rationale:** Access is poor and the engineering connection to the sewer is long and difficult. |
| C33XP  | Parking to shops and flats off Greenwich High Road | **Recommendation:** Not to draft shortlist  
**Rationale:** The engineering connection to the sewer is long and difficult. |
| C33XR  | Parking to flats off Langdale Road | **Recommendation:** Not to draft shortlist  
**Rationale:** The site is too restrictive, with insufficient space to accommodate the required construction works. |
| C33XS  | Gardens to flats off Greenwich High Street | **Recommendation:** Not to draft shortlist  
**Rationale:** The site is very small and restrictive. |
| C33XT  | Parking to front of Greenwich Station | **Recommendation:** Not to draft shortlist  
**Rationale:** The engineering connection to the sewer is long and difficult. |
| C33XU  | Greenwich Pumping Station | **Recommendation:** To draft shortlist |

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

V.2.4 Full details are provided in the Table 2.2 assessment tables and accompanying plans.

V.2.5 Of the 13 sites identified, five were assessed as potentially suitable and passed to the draft short list, while eight sites were eliminated as being unsuitable.

**Assessment of draft short list sites**

V.2.6 The five draft short list sites identified for further assessment at the next stage were:

- C33XA: Greenwich Foreshore (near the Cutty Sark)
• C33XE: Playground (off Randall Place)
• C33XG: Parking to small industrial area
• C33XH: Greenwich Pumping Station (land in front of the Pumping Station)
• C33XU: Greenwich Pumping Station (land in front and to the rear of the Pumping Station).

V.2.7 These sites were further assessed by the engineering, planning, environment, community and property disciplines having regard to the considerations set out in Table 2.3 of the SSM (hereafter referred to as Table 2.3). This stage of the process built on the information gathered and assessment undertaken at long list stage but focussed on more detailed local considerations.

V.2.8 At this stage, we also consulted with each of the London boroughs and pan-London stakeholders, such as the Environment Agency and English Heritage, to seek their views on the suitability of sites for the short list.

V.2.9 The table below summarises the outcome of the Table 2.3 assessment of the draft short list of sites. Sites which were assessed as being the least constrained when considered against Table 2.3 considerations were retained on the short list to pass to the next stage of assessment. This did not necessarily mean that a site would ultimately be judged as suitable, but that no significant constraints were identified in relation to the considerations addressed at Table 2.3. Sites that were judged to be more constrained were not recommended to be retained on the short list for more detailed assessment. The main rationale for the exclusion of these sites at this stage is summarised below.

**Table V.2 Draft short list to final short list for the interception of the Greenwich Pumping Station CSO (Table 2.3 assessment)**

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/ description</th>
<th>Recommendation and rationale</th>
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<tbody>
<tr>
<td>C33XA</td>
<td>Greenwich Foreshore (near the Cutty Sark)</td>
<td>Recommendation: Retain on short list</td>
</tr>
</tbody>
</table>
| C33XE   | Playground (off Randall Place) | Recommendation: Not to shortlist  
Rationale:  
• Engineering – The site is constrained in engineering terms by the adjacent flats and a culvert will need to run below a busy road.  
• Community – The site is located adjacent to a number of sensitive receptors (primary school, playgrounds, surrounded on three sides by terraced residential). |
<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/ description</th>
<th>Recommendation and rationale</th>
</tr>
</thead>
</table>
| C33XG   | Parking to small industrial area             | **Recommendation:** Not to shortlist  
**Rationale:**  
- Engineering – The site is constrained in engineering terms by the adjacent flats and a culvert will need to run below a busy road.  
- Planning/environment – Use of the site would result in a significant cumulative impact on a number of designations.  
- Property – Potential unacceptable acquisition costs and disruption to a number of businesses.  
- Community – The site is located adjacent to a number of sensitive receptors (primary school, playgrounds, surrounded on three sides by terraced residential). |
| C33XH   | Greenwich Pumping Station (front area)       | **Recommendation:** Retain on short list                                                      |
| C33XU   | Greenwich Pumping Station (front and rear)   | **Recommendation:** Retain on short list                                                      |

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

V.2.10 Full details are provided in the Table 2.3 assessment tables and accompanying plans.

V.2.11 Of the five sites on the draft short list, three were assessed as potentially suitable and passed to the final short list, while two sites did not proceed to the final short list. Further details of all the sites shortlisted at this stage of the site selection process can be found in the Shortlisted Sites Report.

**Assessment of the final short list sites**

V.2.12 The three sites identified for inclusion on the final short list and assessment at the next stage were:

- C33XA: Greenwich Foreshore (near the Cutty Sark)
- C33XH: Greenwich Pumping Station (land in front of the Pumping Station)
- C33XU: Greenwich Pumping Station (land in front of and to the rear of the Pumping Station).

V.2.13 A site suitability report (SSR) was prepared for each of the final shortlisted sites. These reports contained an assessment of each site’s suitability, having regard to engineering, planning, environment, community and
property considerations. At this stage in the process, sites were assessed in isolation without comparison to other sites or regard to tunnelling strategy. Sites were assessed by discipline as suitable, less suitable or not suitable from that discipline’s perspective.

V.2.14 A summary of the conclusions of each discipline’s assessment from the site suitability reports is provided below.

**C33XA: Greenwich Foreshore (near the Cutty Stark)**

V.2.15 Site C33XA is located on the River Thames Foreshore, adjacent to Cutty Sark Gardens and Greenwich Pier, in the London Borough of Greenwich.

V.2.16 Cutty Sark Gardens are located to the southeast. To the south and southwest of the site are residential properties, while north of the site is open river. The Thames Path runs adjacent to the site.

V.2.17 **Engineering:** The site was assessed as suitable for use as a CSO site because it appears to be of adequate size and close to the assumed tunnel alignment. Access to and from the site may be difficult, so would need further investigation.

V.2.18 **Planning:** The site was assessed as being not suitable for use as a site to intercept this CSO because it lies within several planning and environmental policy designations, including the World Heritage buffer zone and conservation area. The site is also adjacent to the World Heritage site, open space and residential area.

V.2.19 **Environment:** Overall, the site was assessed as less suitable for use as a CSO site. The site was considered likely to be suitable from the perspectives of transport (note – would need to investigate potential mitigation measures to see if the route to the site could be made suitable), archaeology, hydrogeology and land quality. However, the site was considered less suitable from the perspective of built heritage and townscape, surface water resources, ecology, flood risk, noise and air quality.

V.2.20 **Socio-economic and community:** The site was assessed as less suitable for use as a CSO site. Use of the site would have adverse effects on people using the Thames Path and adjacent gardens. Furthermore, there would be cumulative impacts on the adjacent residential developments.

V.2.21 **Property:** The site was considered suitable for use as a CSO site. The site is undeveloped and the acquisition cost is unlikely to be high, although permission from the Crown will need to be sought.

**C33XH: Thames Water Greenwich Pumping Station (land in front of the Pumping Station)**

V.2.22 Site C33XH is located within the grounds of Greenwich Pumping Station, in the London Borough of Greenwich. The site is bounded by the listed sewage pumping station building to the north, with Deptford Creek and the DLR and a railway line beyond.
To the east are a vacant industrial estate and various community and business premises. To the south is Greenwich High Road, which contains a number of residences and business, while to the west is primarily industrial and warehouse buildings.

**Engineering:** The site was assessed as **suitable** for use as a CSO site because it appears to be of adequate size and has good road access.

**Planning:** The site was assessed as being **suitable** for use as a site to intercept this CSO because it is consistent with the existing permitted pumping station use. Mitigation measures will be required to reduce impacts on the planning and environmental designations applicable to the site and any adjacent residential dwellings.

**Environment:** Overall, the site was assessed as **suitable** for use as a CSO site. The site was considered likely to be **suitable** from the perspectives of transport, archaeology, hydrogeology, land quality, surface water resources, ecology, noise quality and flood risk. However, the site was considered **less suitable** from the perspective of built heritage and townscape, water resources (hydrogeology) and air quality.

**Socio-economic and community:** The site was assessed as **suitable** for use as a CSO site. Local businesses adjacent to the site, including two public houses and an office building, may be affected by construction related impacts from the site. Mitigation may involve discussions around noise attenuation measures.

**Property:** The site was considered **suitable** for use as a CSO site as the acquisition cost would be acceptable. A ministerial procedure may be needed to acquire part, or all, of the site, which could cause unacceptable delays to the project. However, it should also be noted that Thames Water is in occupation of the site, which should help to avoid any procedural difficulties.

**C33XU: Thames Water Greenwich Pumping Station (land in front of and to the rear of the Pumping Station)**

Site C33XU is located within the grounds of Greenwich Pumping Station, in the London Borough of Greenwich. The site contains the listed sewage pumping station and Thames Water’s operational land. The eastern edge of the site is Norman House, Deptford Creek along the western edge. The DLR runs through the northern tip of the site and to the south is Greenwich High Street.

**Engineering:** The site was assessed as **suitable** for use as a CSO site as it appears to be of sufficient size and has good road access.

**Planning:** The site was assessed as being **suitable** for use as a site to intercept this CSO because it is consistent with the existing permitted pumping station use. Furthermore, the site is relatively unconstrained by planning policies.

**Environment:** Overall, the site was assessed as **suitable** for use as a CSO site. The site was considered likely to be **suitable** from the perspectives of transport, archaeology, surface water, ecology, flood risk, noise and land quality. However, the site was considered **less suitable**
from the perspective of built heritage and townscape, groundwater and air quality, and these impacts would require mitigation.

V.2.33 **Socio-economic and community:** The site was assessed as **suitable** for use as a CSO site. The area in proximity to the site is mainly industrial and commercial. There are unlikely to be impacts on the nearby business due to the DLR line and the sewage pumping station acting as barriers between the site and local businesses.

V.2.34 **Property:** The site was considered **suitable** for use as a CSO site as the acquisition cost would be acceptable. A ministerial procedure may be needed to acquire part, or all, of the site, which could cause unacceptable delays to the project. However, it should also be noted that Thames Water is in occupation of the site, which should help to avoid any procedural difficulties.

**Identification of the preferred site**

V.2.35 Following the completion of the SSRs, a multidisciplinary workshop was held to compare the suitability of each of the shortlisted sites based on the SSR assessments, and to make a recommendation on which site should be identified as the preferred site.

V.2.36 From the three shortlisted sites, Greenwich Pumping Station (land in front of and to the rear of the pumping station) (C33XU) was identified as the preferred site for a number of reasons, which are summarised below:

- The foreshore site, C33XA, is considered less suitable compared to the other sites. The site is within the conservation area and adjacent to the World Heritage site. This is a busy area used by a large number of tourists and has a very high amenity value. A site in this area is likely to conflict with a number of Greenwich Unitary Development Plan policies. Route and access to the site may be difficult. The temporary and permanent structures may be difficult to integrate into foreshore and may potentially impact on the foreshore habitat.

- In addition to the constraints discussed above for C33XA, foreshore sites generally are not preferred where other viable land-based sites exist due to the increased health and safety risks and construction costs association with working in the river.

- Therefore, this foreshore site was not preferred over the available and useable Thames Water owned land-based site.

- Both pumping station sites (C33XH and C33XU) are owned by Thames Water. C33XH site (land in front of Greenwich Pumping Station) is more constrained as it contains significant below-ground works associated with the operation of the pumping station. The pumping station is listed, and placing the works in front of it in the grassed area was judged to have more impact on the setting of the pumping station and some impact on the listed coal sheds.

- The site at the rear of Greenwich Pumping Station (C33XU) is located between the pumping station and the raised DLR viaduct. This land has less underground constraints, so there would be less impact on
the day-to-day operation of the pumping station. It was judged to have less impact on the listed pumping station compared to the site at the front (C33XH). Also the listed coal sheds would less visible from a site at the rear of the pumping station (C33XU) than the site at the front (C33XH).

V.2.37 C33XU was therefore identified as the preferred site for the interception of flows from the Greenwich Pumping Station CSO to receive the connection tunnel from King’s Stairs Gardens.

V.3 Review of preferred site following phase one consultation

Phase one consultation responses

V.3.1 As part of the site selection methodology, all feedback received during the phase one consultation was reviewed and taken into account in the development of our scheme for phase two.

V.3.2 The main issues and concerns raised during phase one consultation in relation to the preferred pumping station site were:

- impact of odour
- impact on existing heritage within the area
- impact of construction on local residents
- impact of construction traffic on Greenwich High Road.

V.3.3 The main comment received in support of the preferred site stated that it is a suitable choice since it uses land within Thames Water’s ownership.

V.3.4 More details on the consultation responses relating to this site and our responses to the comments received are provided in the Report on phase one consultation.

Back-check process

V.3.5 Following our review of the feedback received during phase one consultation and design development, we decided that Greenwich Pumping Station should remain our preferred CSO interception site. However, due to other changes to the main tunnel sites and tunnelling strategy to the eastern tunnel sections, we need to investigate the use of C33XV: Greenwich Pumping Station site.

V.3.6 We also decided we would change our eastern main tunnel site from King’s Stairs Gardens to Chambers Wharf, which would become our phase two consultation site (see Appendix R). Chambers Wharf is constrained by site size and programme limitation, so this site can only support one tunnel drive. Further investigation also found that it would be difficult to drive the main tunnel from Abbey Mills. Therefore, we decided

3 It should be noted the two previous polygons (C33XH and C33XU) were withdrawn. They only covered parts of the Greenwich Pumping Station site and were only big enough for a connection tunnel reception site. A new larger polygon was created for the Greenwich Pumping Station site (C33XV). This covered all of Thames Water’s land plus we needed to add a strip of land between the pumping station site and the railway. More detailed work within the previous polygon C33XU showed that the DLR viaduct constrained the construction area too much.
to use Chambers Wharf to drive the main tunnel to Abbey Mills. Due to these limitations, we needed to investigate driving the connection tunnel from Greenwich Pumping Station or an alternative site.

V.3.7 Therefore, in response to these changes, we undertook a back-check to assess sites and connection tunnel drive options. The connection tunnel is needed to connect three CSOs (Earl Pumping Station [CS31X], Deptford Storm Relief [CS32X] and Greenwich Pumping Station [CS33X]) to the main tunnel. First we assessed whether the Greenwich Pumping Station could be enlarged to accommodate a connection tunnel drive, then we checked if there were any other shortlisted sites that we could use to construct the connection tunnel.

V.3.8 In order to create a larger site at C33XV: Greenwich Pumping Station, we identified four nearby areas of land that could be used for additional facilities to deal with excavated materials. It is worth noting that the CSO interception and drop shaft would remain on the Greenwich Pumping Station (C33XV). The four additional areas of land to be used with Greenwich Pumping Station were taken through our site selection process:

- CL004: Greenwich industrial Estate, Norman Road – this site is located to the east, into part of the Greenwich Industrial Estate
- CL005: Phoenix Wharf – this site is a builders’ merchants, located to the north of the Greenwich Pumping Station site and to the north of the railway line
- CL006: Sun Wharf – this site is an office building and industrial units situated to the west of the Greenwich Pumping Station site, across the Deptford Creek
- CL007: Faircharm Trading Estate – this site consists of industrial properties and commercial units situated to the west of the Greenwich Pumping Station site, across the Deptford Creek.

V.3.9 These sites are shown relative to C33XV in Annex V.2.

V.3.10 These sites were assessed against the engineering, planning, environment, community and property considerations set out in Table 2.2.

V.3.11 The table below summarises the outcome of the ‘back-check’ assessment of the back-check long list of sites. Sites which were assessed as being the least constrained when considered against Table 2.2 considerations passed to the next phase of assessment. This did not necessarily mean that these sites would ultimately be judged as suitable, but that no significant constraints were identified in relation to the high-level considerations addressed at Table 2.2. Sites that were judged to be more constrained were not recommended to be passed to the back-check draft short list for more detailed assessment. The main rationale for the exclusion of these sites at this stage is summarised in the table.

V.3.12 As can be seen below, all sites were assessed as less constrained and therefore progressed to the back-check draft short list.
Table V.3 Long list to draft short list for additional land to drive the tunnel from Greenwich Pumping Station (Table 2.2 assessment)

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name/description</th>
<th>Recommendation and rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL004</td>
<td>Greenwich industrial Estate, Norman Road</td>
<td><strong>Recommendation:</strong> To draft shortlist</td>
</tr>
<tr>
<td>CL005</td>
<td>Phoenix Wharf</td>
<td><strong>Recommendation:</strong> To draft shortlist</td>
</tr>
<tr>
<td>CL006</td>
<td>Sun Wharf</td>
<td><strong>Recommendation:</strong> To draft shortlist</td>
</tr>
<tr>
<td>CL007</td>
<td>Faircharm Trading Estate</td>
<td><strong>Recommendation:</strong> To draft shortlist</td>
</tr>
</tbody>
</table>

NB. The Site ID and Site name/description were used as an internal mechanism to record and describe the site and are reproduced here to ensure consistency across documentation.

V.3.13 Full details are provided in back-check Table 2.2 assessment tables and accompanying plans.

V.3.14 Of the four sites identified, all were assessed as potentially suitable and passed to the draft short list.

Assessment of the back-check draft short list sites

V.3.15 The four back-check draft shortlisted sites were then further assessed by the engineering, planning, environment, community and property disciplines, having regard to the considerations set out in Table 2.3 of the SSM.

V.3.16 The table below summarises the outcome of the back-check assessment of the draft short list of sites. Sites which were assessed as being the least constrained when considered against Table 2.3 considerations were retained on the back-check short list to pass to the next stage of assessment. This did not necessarily mean that a site would ultimately be judged as suitable, but that no significant constraints were identified in relation to the considerations addressed at Table 2.3. Sites that were judged to be more constrained were not recommended to be retained on the back-check short list for more detailed assessment.

V.3.17 The main rationale for the exclusion of these sites at this stage is summarised below.
### Table V.4 Draft short list to final short list for additional land to drive the tunnel from Greenwich Pumping Station (Table 2.3 assessment)

<table>
<thead>
<tr>
<th>Site ID</th>
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<td><strong>Recommendation:</strong> Retain on short list</td>
</tr>
<tr>
<td>CL005</td>
<td>Phoenix Wharf</td>
<td><strong>Recommendation:</strong> Retain on short list</td>
</tr>
<tr>
<td>CL006</td>
<td>Sun Wharf</td>
<td><strong>Recommendation:</strong> Not to shortlist</td>
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<td></td>
<td><strong>Rationale:</strong></td>
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<tr>
<td></td>
<td>• Engineering – The site is separated</td>
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<td></td>
<td>from C33XV by railway arches and Deptford Creek. There are also some access constraints and demolition is required.</td>
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<td></td>
<td>• Planning/Environment – The site is</td>
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<td></td>
<td>located within a mixed-use employment</td>
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<td>location, an area of archaeological</td>
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<td>potential and a SINC. The site is also</td>
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<td></td>
<td>in close proximity to residential</td>
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<td></td>
<td>properties. Furthermore, transport</td>
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<td>between the this site and C33XV may</td>
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<td>be more difficult than sites on the</td>
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<td></td>
<td>other side of Deptford Creek.</td>
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<td></td>
<td>• Property – The site is an existing</td>
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<td>industrial estate with commercial</td>
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<td>occupiers, so acquisition may be</td>
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<td>acceptable but significant.</td>
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<td>• Community – Use of the site is likely</td>
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<td>to impact on the local economy but this</td>
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<td>can be mitigated if suitable alternative</td>
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<td>premises can be found in the vicinity</td>
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<td>for the businesses.</td>
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<td>CL007</td>
<td>Faircharm Trading Estate</td>
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<td>properties. Furthermore, transport</td>
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</tr>
<tr>
<td></td>
<td>between the this site and C33XV may</td>
<td></td>
</tr>
</tbody>
</table>
### Site ID | Site name/description | Recommendation and rationale
---|---|---
| | | be more difficult than sites on the other side of Deptford Creek.
| | | • Property – The site is an existing industrial estate with commercial occupiers, so acquisition may be acceptable but significant.
| | | • Community – Use of the site is likely to impact on the local economy but this can be mitigated if suitable alternative premises can be found in the vicinity for the businesses.

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

V.3.18 Full details are provided in back-check Table 2.3 assessment tables and accompanying plans.

V.3.19 Of the four sites on the draft short list, two were assessed as potentially suitable and passed to the final short list, while two sites did not proceed to the final short list.

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

V.3.20 The two remaining additional areas were then combined with the Greenwich Pumping Station site (C33XV) and an SSR was prepared to cover all three potential scenarios:

- Option 1 – C33XV + CL004: Thames Water Greenwich Pumping Station + Greenwich industrial Estate, Norman Road – long connection tunnel drive site.
- Option 2 – C33XV + CL005: Thames Water Greenwich Pumping Station + Phoenix Wharf – long connection tunnel drive site.
- Option 3 – C33XV: Thames Water Greenwich Pumping Station – long connection tunnel reception site.

V.3.21 A summary of the SSR conclusions is provided below:

V.3.22 **Engineering:** The site is **suitable** as a CSO site for all site options. For Option 1, slurry from the tunnelling machine would need to be pumped across Norman Road, either in a buried pipe or a pipe bridge. Under Option 2, this slurry would need to be pumping through the railway arches. For all options, the interfaces between the construction site and the Thames Water operational parts of the site will need to be carefully managed to minimise any associated health and safety hazards.

V.3.23 **Planning:** Option 1 is considered **less suitable** as a CSO and a long connection tunnel drive site. The use of Greenwich Industrial Estate would be contrary to the mixed-use designation and policies which are in place at the site, and could compromise or delay the implementation of the planning application for the redevelopment of the site which is under consideration currently. Option 2 is considered **suitable** as CSO and a
long connection tunnel drive site as the use of Phoenix Wharf is considered acceptable in planning terms. For all three options, use of the Greenwich Pumping Station site would be consistent with the existing land use, which includes Thames Water operational activities.

V.3.24 Further consideration of the detailed site layout is required to reduce potential visual and physical impacts on the listed pumping station and other listed buildings on site. In addition, with a number of planning permissions for residential in the vicinity of all the site options, mitigation is likely to be required to ensure development is not contrary to amenity and pollution planning policies.

V.3.25 **Environment:** Overall, the site is **suitable** for both options 1 and 2 as a CSO with a (long) drive connection tunnel, and for Option 3 as a CSO with a (long) reception connection tunnel, although further investigation would be required as to whether built heritage, hydrogeology, air quality and land quality impacts could be adequately mitigated. Based on current information, the site is **suitable** from the perspective of transport, archaeology, townscape, water resources (surface water), ecology, flood risk and noise. For Option 3, the site is also **suitable** from a built heritage perspective. This site is considered **less suitable** from the perspectives of water resources (hydrogeology), air quality and land quality. For options 1 and 2, the site is also **less suitable** from a built heritage perspective.

V.3.26 **Socio-economic and community:** Option 1 is considered **less suitable** for use as a CSO and long connection tunnel drive site. Construction work is likely to impact on the newly-built residential development to the west of the coal sheds and offices in Norman House, and significant mitigation will therefore be required to reduce impacts on these properties. Further residential properties to the south, a pub and community centre and the builder’s merchant business to the north may also be affected but this appears likely to be to a lesser extent. A footpath and cycle route which runs under the railway lines would also need to be relocated.

V.3.27 Option 2 is **suitable** for use as a CSO and long connection tunnel drive site. In addition, to those impacts detailed above, two businesses operating out of the premises on Phoenix Wharf will also need to be relocated, and those operating out of the surrounding properties may face some disruption. However, the potential to use Deptford Creek to remove excavated materials differentiates the use of this option from option 1 above.

V.3.28 Option 3 is considered **suitable** as a CSO and long connection tunnel reception site. Given the greatly reduced scope of work required in this option, it appears unlikely that the proposed activities would impact on the neighbouring residential properties or commercial and industrial land uses.

V.3.29 **Property:** Option 1 is considered **less suitable** as a CSO and a connection tunnel drive site. The main part of the site is already within Thames Water ownership and acquisition costs for temporary use of additional land are expected to be acceptable. However, the grant of planning permission for redevelopment of site CL004 appears likely prior to acquisition, which would increase acquisition costs. If redevelopment of
this site commenced prior to acquisition, the assessment would change to **not suitable**.

V.3.30 Option 2 is considered **suitable** as a CSO and a connection tunnel drive site. The main part of the site is already within Thames Water ownership and acquisition costs for temporary use of additional land are expected to be acceptable. Parts of the site are within Network Rail ownership, which may add acquisition risk. Furthermore, business occupiers will be displaced. Also, there is a possibility that discretionary purchase costs will be incurred in respect of new flats under construction on the adjoining site.

V.3.31 Option 3 is considered **suitable** as a CSO and a connection tunnel reception site as the entire site is already within Thames Water ownership, and acquisition costs are expected to be insignificant.

### Assessment of alternative connection tunnel drive sites

V.3.32 In addition to the back-check review above to see if additional land could be used in association with the Greenwich Pumping Station, we checked if there were other shortlisted sites that could be used to help construct the connection tunnel. For these additional sites, there would be no permanent works or access left at ground level and the drive shaft would be capped off below ground level, and nothing would be left accessible or visible.

V.3.33 We only considered sites that were in proximity to the proposed alignment of the connection tunnel that joins the Greenwich Pumping Station, Deptford Storm Relief and Earl Pumping Station CSOs to the main tunnel at Chambers Wharf.

V.3.34 Two sites were considered to have the necessary area to facilitate the engineering and construction layout requirements associated with a long connection tunnel drive site:

- **S74SK**: The Boatyard, Calypso Way
- **S01LM**: Convoys Wharf.

V.3.35 A site suitability report (SSR) was prepared for these potential sites. A summary of the conclusions is provided below.

### **S74SK: The Boatyard, Calypso Way**

V.3.36 The site S74SK is South Dock marina boat yard, located in the London Borough of Southwark. The site is roughly rectangular in shape and approximately 80 per cent of the site is occupied by a boatyard with a riverside walk running through the north and east of the site.

V.3.37 The surrounding area is predominantly residential, with the nearest residential properties located within approximately 12 metres of the site boundary. To the north, the site is bounded by a lock accessing the South Dock. The River Thames lies to the east. The site also bounds St George’s Square and a car park, which is located to the south of the park. Calypso Way borders the west of the site.

V.3.38 **Engineering**: The site was assessed as **less suitable** for use as a drive site for a long connection tunnel. It has reasonable road and river access.
However, it should be noted that the site is on the small side and it would need to be extended out into the foreshore in order to create sufficient working space.

V.3.39 **Planning:** The site was assessed as being less suitable for use as a drive site for a long connection tunnel. A series of planning designations are applicable to the site and mitigation is likely to be required to reduce visual, general amenity and setting impacts on these designations. Furthermore, use of the site would result in temporary loss of the boatyard for a lengthy period of time. There are also potential impacts on residential amenity, and mitigation proposals should be considered further, particularly since there is no scope to relocate the construction works within the site to increase the separation distance between the works and adjacent dwellings.

V.3.40 **Environment:** Overall, the site was assessed as less suitable for use as a drive site for a long connection tunnel. The site was considered likely to be suitable from the perspectives of transport, archaeology, townscape and water resources (hydrogeology). However, the site was considered less suitable from the perspectives of built heritage, water resources (surface water), flood risk, ecology, air quality, noise and land quality impacts. Further investigations would be required in order to establish whether these impacts can be mitigated.

V.3.41 **Socio-economic and community:** The site was assessed as less suitable for use as a drive site for a long connection tunnel. Use of the site would result in the temporary loss of the boatyard or requirement for its relocation, which has the potential to impact on the business, its employees and any other businesses in the area that rely on the use of the boatyard, along with their employees. The use of the site is also likely to have an impact on the residents living in the properties opposite the site to the north, south and west.

V.3.42 **Property:** The site was considered suitable for use as a long connection tunnel drive site because the acquisition costs are judged to be acceptable based on current available information.

**S01LM: Convoys Wharf**

V.3.43 Site S01LM, known as Convoys Wharf, is a large, irregular-shaped site consisting of industrial buildings and warehouses, located at the junction of Leeway and Grove Street in the London Borough of Lewisham, close to its boundary with the London Borough of Greenwich.

V.3.44 The surrounding area is primarily residential, with residential properties orientated towards the site, along its southeast, northwest and southwest boundaries. The Pepys Estate is also adjacent to the site to the north and west, with flats to the west, some of which are likely to overlook the site. Recently constructed residential flats, some of which are 11 storeys high, also lie to the north, adjoining Leeway.

V.3.45 **Engineering:** The site was assessed as suitable for use as a drive site for a long connection tunnel because it has good vehicular access and the site already has wharfage and jetty facilities which could potentially be
utilised, possibly with further development. The site is also large enough to fit all the site facilities.

V.3.46 **Planning:** The site was assessed as being **less suitable** for use as a drive site for a long connection tunnel due to its proximity to residential receptors and public open space, which is likely to be contrary to planning policies protecting amenity, open space, metropolitan open land and views. Because of the size of the Convoys Wharf site, it is considered that such relocation is possible, which would make the site acceptable in planning terms. Furthermore, phased development of the Convoys Wharf site could be used to prevent development from being delayed on the site.

V.3.47 **Environment:** Overall, the site was assessed as **less suitable** for use as a drive site for a long connection tunnel. The site was considered likely to be **suitable** from the perspectives of transport, built heritage and townscape, water resources (hydrogeology and surface water) and flood risk. However, the site was considered **less suitable** from the perspective of archaeology, ecology, air quality, noise and land quality. Further investigations would be required in order to establish whether these impacts can be mitigated.

V.3.48 **Socio-economic and community:** The site was assessed as **less suitable** for use as a drive site for a long connection tunnel. This site may impact on local residential properties and users of the park. The site could become **suitable** if the proposed works could be moved southeast to increase the separation from the residential properties and the park.

V.3.49 **Property:** The site was considered **suitable** for use as a long connection tunnel drive site because the acquisition costs are judged to be acceptable, based on current available information.

**Selection of preferred site**

V.3.50 A multidisciplinary workshop was held and out of the two choices for Greenwich Pumping Station, we preferred to use the additional land at Phoenix Wharf (C33XV + CL005) instead of Norman Road (C33XV + CL005). The main considerations against using the Norman Road site were that excavated material would need to be taken across the road from the pumping station site and it would be contrary to planning policy, with an active planning application under consideration. Considerations in favour of using Greenwich Pumping Station plus Phoenix Wharf included the fact that it allows use of an existing Thames Water site, with consequent operational efficiencies and a controlled environment.

V.3.51 The three shortlisted sites for the Greenwich connection tunnel are shown in Annex V.3. In order to identify our overall preferred tunnel drive strategy, we needed to consider the connection tunnel options to see how this would be connected to the main tunnel at Chambers Wharf. We put the shortlisted sites into three zones, with each zone corresponding to a particular drive strategy. These included:

- **Zone G1 – S74SK:** Boatyard – long connection tunnel drive site in two directions
• Zone G2 – S01LM: Convoys Wharf – long connection tunnel drive site in two directions

• Zone G3 – C33XV and CL005: Thames Water Greenwich Pumping Station and Phoenix Wharf – long connection tunnel drive site.

V.3.52 On the basis of the assessments described above and professional judgement, it was agreed by all disciplines at the workshop that we preferred to drive a long connection tunnel from Greenwich Pumping Station and Phoenix Wharf from Zone G3. Using the sites in Zones G2 or G3 would also require the use of Greenwich Pumping Station (because the CSO still needs to be intercepted) and would require an additional temporary shaft to be excavated. Therefore, using Greenwich Pumping Station with Phoenix Wharf is more efficient, would cost less and reduce risks.

V.4 Site development
V.4.1 Following the selection of Greenwich Pumping Station with Phoenix Wharf as the recommended preferred site, further feedback from stakeholders and ongoing scheme development work have contributed to a number of further site changes.

Engagement with stakeholders
V.4.2 Engagement with stakeholders has been ongoing and has continued beyond the phase one consultation period. This has resulted in continual development of our proposals to take on board the comments made by stakeholders.

V.4.3 We have engaged with community and interest groups through ongoing meetings and correspondence. Furthermore, we have had regular meetings and workshops with officers from the London Borough of Greenwich, Transport for London (TfL), the Environment Agency, English Heritage and our other pan-London stakeholders with respect to developing the design and construction of our works, mitigating our impacts on the river and the scope of our environmental assessments. To ensure our design process is transparent, we undertook a series of design reviews, hosted and chaired by the Design Council CABE (formerly the Commission for Architecture and the Built Environment). The reviews for Greenwich Pumping Station was attended by the London Borough of Greenwich and our pan-London stakeholders.

V.4.4 We have undertaken a series of drop-in sessions to present and discuss the suitability of potential alternative sites. These comments have been considered and details are provided in the Interim engagement report.
Construction layout

V.4.5 In response to stakeholder engagement, phase one consultation responses and scheme development, the construction layout of the site has been altered to minimise impact on the local community and environment, and is guided by operational and functional requirements. A particular factor at this site that has influenced the layout is as follows:

- The site layout and shaft location have been determined by the location of existing listed buildings, underground infrastructure associated with the pumping station and proximity to the Docklands Light Railway viaduct.

V.4.6 Further information on the construction logistics and the site layouts for the construction and operational phases can be found in the Greenwich Pumping Station site information paper.

Design

V.4.7 Since phase one consultation, we have progressed the design for the permanent use and appearance of the structures at Greenwich Pumping Station. The design of the permanent proposals follows our scheme-wide principles and has taken into account comments made and ongoing engagement with the London Borough of Greenwich and other technical consultees.

V.4.8 Full details of design development for the Greenwich Pumping Station site are provided in the Design development report.

V.5 Phase two consultation

V.5.1 A final preferred site workshop was held in summer 2011 to verify the choice of preferred sites and to consider any outcomes of further engagement and scheme development. The conclusion reached was that C33XV + CL005: Greenwich Pumping Station/Phoenix Wharf should become the phase two consultation preferred site for the interception of the Greenwich Pumping Station CSO and to drive a long connection tunnel to Chambers Wharf.

Phase two consultation will provide an opportunity for the public to comment on our revised preferred site and scheme for the Thames Tunnel project, before we publicise our proposed application.
Annex V.1
This is a working draft plan which has been produced for the purpose of phase two consultation on the Thames Tunnel project. The information shown on the plan is illustrative of what will be required for the purpose of constructing and operating the Thames Tunnel project. The information shown on the plan may change as a result of Thames Water’s consideration of the responses received to phase two consultation and any further design development that is carried out.

The Point, 7th Floor, 37 North Wharf Road, Paddington, London W2 1AF

Title: Preferred List: CSO Sites
C33X
Greenwich Pumping Station

Legend
- Local authority boundary (OS)
- Pumping Station
- CSO directly controlled

Site Selection
- Yes at Table 2.2
- Yes at Table 2.3
- Preferred site for the preferred tunnel route
- Not a preferred site

Note
Sites C33XH and C33XV have been retired.

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Title: Preferred List: CSO Sites
C33X
Greenwich Pumping Station
Annex V.2
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Annex V.3
This is a working draft plan which has been produced for the purpose of phase two consultation on the Thames Tunnel project. The information shown on the plan is illustrative of what will be required for the purpose of constructing and operating the Thames Tunnel project. The information shown on the plan may change as a result of Thames Water’s consideration of the responses received to phase two consultation and any further design development that is carried out.