Written Representation of

London Borough of Southwark (Ref.10018659)

Application for Development Consent for the

Thames Tideway Tunnel

November 2013

Contents

1 Executive Summary

1.1 Summary of Sites

1.1.2 There are two sites within the London Borough of Southwark where works are proposed:

Chambers Wharf - where it is proposed in the application to drive the main tunnel to Abbey Mills Pumping Station and to receive both the main tunnel drive from Kirtling Street to the west and an overflow tunnel from Greenwich.

Shad Thames Pumping Station – where works are proposed to control the Shad Thames Pumping Station combined sewer overflow.

1.1.3 In addition, works are proposed at **Earl Pumping Station** where it is intended to connect the Earl Pumping Station combined sewer overflow to the Greenwich connection tunnel in order to convey flows to Chambers Wharf where they would be transferred into the main tunnel. Whilst located within the London Borough of Lewisham, the site is located in close proximity to the boundary with Southwark and is therefore likely to result in impacts upon Southwark's residents.

1.1.4 The proposed works at **Blackfriars Bridge Foreshore** (within the City of London), involving the construction of a combined sewer overflow to intercept an existing sewer, are located on the north bank of the River Thames and also have the potential for impacts upon Southwark's roads and residents.

1.1.5 The Council wishes to raise the key points outlined below in this written representation with regards to the preparation and detail of the Thames Tideway Tunnel application submitted to the Planning Inspectorate on 28 February 2013 by the applicant, Thames Water Ltd.

1.1.6 This representation should be read in conjunction with the London Borough of Southwark's Local Impact Report which sets out the Council's overall position on the application proposals including specific sections on:

- The impacts of the works as proposed at Chambers Wharf
- The impacts of the works as proposed at Shad Thames
- The impacts of the works as proposed at Earl Pumping Station for resident's in Southwark
- The impacts of the works as proposed at Blackfriars Bridge Foreshore for residents in Southwark
- The project wide transportation impacts
- Comments on the Draft Development Consent Order

1.1.7 This written representation has been formally approved as a Key Decision by the Leader of the Council under the Council's Scheme of Delegation.

1.2 Strategic Environmental Assessment

1.2.1 The basis for the application is legally flawed due to the failure to adequately identify reasonable alternative tunnel routes and properly justify the selected tunnel route. Previous assessments are out of date

and do not provide an adequate basis for the lawful decision making in relation to the DCO.

1.2.2 A proper assessment of the locational options for dealing with London's sewerage problem including the alternatives to the preferred route for the tunnel now proposed in the DCO has not been carried out.

1.2.3 It is a mandatory requirement under Directive 2001/42/EC (as transposed by the Environmental Assessment of Plans and Programmes Regulations 2004) for a SEA to be submitted with plans or programmes which are prepared for waste and/or water management schemes and set the framework for development consent of EIA projects. The absence of a SEA is a significant failing in that there has been no adequate assessment of the cumulative impacts of the development or an evaluation of the positive and negative impacts of the preferred tunnel scheme against other reasonable alternatives. Moreover, the assessment that has been done is out of date and is not an adequate basis for lawful decision making in relation to the DCO.

1.2.4 The council has sought legal advice on this issue (attached as appendix 1) from Pinsent Masons LLP dated 20 September 2013. A copy of this advice has been sent to Thames Water and the Planning Inspectorate. This advice confirms the council's assessment that the NPS AoS has been inadequate at meeting the requirements of the SEA directive.

1.3 Inadequate pre-application consultation

1.3.1 Thames Water's pre-application consultation was ineffective with no proper opportunity and inadequate information for consultees to influence the selection of Chambers Wharf as a drive site and mitigation of impacts at Shad Thames and Earl Pumping Stations and Blackfriars Bridge Foreshore. Inadequate consideration was given to the representations made.

1.3.2 The council considers that the pre-application consultation process has been neither effective nor meaningful. The applicant has failed to adequately respond to the council's pre-application responses and many significant concerns remain outstanding. Given the significance of the project and its potential impact on residents in Southwark, a greater amount of dialogue should have taken place between Thames Water and the Local Planning Authority. Whilst a number of progress meetings have occurred, these have generally been in the format of information giving and no meaningful changes to the scheme appear to have arisen as a result of our discussions, nor has any meaningful feedback been given.

1.3.3 The lack of provision of key environmental and other information regarding important elements of the project has meant that it has not been possible for participants to give proper consideration to matters such as site selection and the controls and mitigation that would be required to protect the areas around the sites. Insufficient background information has been provided during the pre-application stages on the reasons for the selection of Chambers Wharf as a main drive site and no clarification has been given on the weighting given to each of the site selection criteria. This has made it extremely difficult for consultees to properly engage on what is a crucial issue with very significant resulting impacts.

1.3.4 Relevant information on matters such as those affecting local schools, health impacts and archaeology has also not been forthcoming making it difficult for participants to properly comment in a way which can help to influence the development proposals.

1.3.5 The Planning Act 2008 requires the 'front loading' of the application process. The developer must also demonstrate how they have taken account of any feedback that has been provided by the local community, the local authority and statutory consultees. The council considers that this process has not been adequately undertaken by Thames Water and therefore it has not been possible for the council to engage with the process to provide advice to the applicant or discuss suitable mitigation in a way that has informed the content of the application. Ultimately this poor standard of consultation has led to the wrong decision by Thames Water in its selection of Chambers Wharf as a drive site and inadequate mitigation of impacts at Shad Thames and Earl Pumping Station sites and Blackfriars Bridge Foreshore.

1.4 Site Selection Methodology

1.4.1 Thames Water's methodology for construction site selection is opaque and flawed

1.4.2 The council considers that that the site selection methodology process carried out by Thames Water is seriously flawed. This process has resulted in the Chambers Wharf site being proposed as a main drive site to drive a tunnel boring machine (TBM) to Abbey Mills.

1.4.3 The basis upon which the applicant has sought to choose Chambers Wharf as a main drive site in preference to Abbey Mills is fundamentally flawed. It remains far from clear why the applicant has chosen Chambers Wharf as a main drive site in preference to Abbey Mills. No detail has been provided as to the weighting that has been given to the relevant factors in arriving at the proposed site selection. The only area in which the outcome of the assessment favours Chambers Wharf relates to barge transport, in that it is claimed to be easier and more practicable for barges to access this site to remove the spoil from the tunnelling than at Abbey Mills. Thames Water has submitted no reports to show justification or allow testing of this conclusion. The council does not consider that this factor overrides the real and significant harm that would result for residents, schools and others around the Chambers Wharf site from the development as currently proposed.

1.4.4 Ultimately this flawed methodology has led to the wrong decision by Thames Water in its selection of Chambers Wharf as a drive site and inadequate mitigation of impacts at Shad Thames and Earl Pumping Station sites and Blackfriars Bridge Foreshore.

1.5 Summary of impacts on Chambers Wharf as a Drive Site

1.5. The use of Chambers Wharf as a drive site will result in very significant harm to the living conditions of residents around the site and the learning environment of children at two schools located in close proximity to the site.

1.5.1 Chambers Wharf is wholly unsuitable as a drive site and will result in significant harm to the area, including noise, air quality, highway safety and traffic impacts. The site is very constrained by its proximity to sensitive receptors including many residential properties directly adjacent to and facing the site, along with three local schools, two of which are located in very close proximity to the site.

1.5.2 The site is located in heavily populated residential area, as well as properties immediately adjacent to three sides of the site, there are several hundred more properties within the wider vicinity of the site along with businesses and community facilities. In total, there will be over 4000 residents living within 400m of the site (approximately four times as many than within the same distance at Abbey Mills). The Thames Path runs along side the site via Chambers Street which is also very well used by pedestrians, joggers and cyclists.

1.5.3 Taking account of its sensitive location, the proposed works on this constrained site, along with related traffic and barge activity, taking place over a period of six years or more and seeking to involve 24 hour working for long periods of time, will result in significant harm from noise and disturbance to the amenities, residential living conditions and the learning conditions at schools in the vicinity of the site.

1.5.4 The proposed construction traffic including HGV movements (up to 110 per day) and other light vehicle movements raises serious concerns with regard to road and pedestrian safety. The uncertainty of the applicant's commitment towards barge movements means that these movements could increase further, with severe knock-on effects for the living conditions of residential properties, schools (particularly Riverside Primary School) and local highway conditions. An increase in the number of HGV movements over a sustained period of time will also exacerbate existing congestion on Jamaica Road and affect journey time reliability for site traffic, leading to the likelihood of vehicles having to wait on local streets.

1.5.5 The cumulative impacts on the area around the site should not be underestimated. The very close proximity to sensitive receptors, the long construction period and the unsatisfactory mitigation provided, coupled with a combination of the recognised impacts including those resulting from noise, air quality, visual amenity and highway safety means that residents and school children will experience significant harm to their living and learning environment for several years. Such an impact will be compounded by the fact the project is likely to follow two years of construction works currently taking place on an adjacent site (180 dwellings) and will be followed by a further two to three years of construction works on the permitted residential development (407 dwellings) on the site itself.

1.5.6 The concerns over the impacts of the construction activities on the surrounding area are exacerbated by the lack of detail and certainty within the application proposals regarding the layout and operation of what will be a long term construction site. There currently exists far too great an amount of flexibility as to how the construction process will unfold, and the layout of the site for each construction phase, creating the potential for greater than necessary impacts and significant uncertainty for local residents and schools.

1.5.7 The site at Chambers Wharf is not large enough to contain all the required construction activities and operations without resulting in significant impacts upon the surrounding area. There is not an opportunity to provide the appropriate amount of space within the site for storage, equipment, office/welfare buildings, vehicle manoeuvring and parking space without adverse impacts resulting. The need to construct an extensive coffer dam to provide barge access will result in further significant noise and transport impacts.

1.5.8 The proposed mitigation measures included within the draft requirements and planning obligations accompanying the application are wholly inadequate to provide any meaningful protection for local residents, schools and highway users. The applicant's inability to provide appropriate mitigation measures to mitigate the detrimental effects of the construction works demonstrates the inappropriateness of Chambers Wharf as a main drive site.

1.6 Abbey Mills is more suitable as a drive site

The drive strategy should be reviewed in light of the fact that Abbey Mills is clearly a more appropriate drive site than Chambers Wharf.

1.6.1 The information contained in the application shows that Abbey Mills is clearly a more appropriate drive site than Chambers Wharf. In particular, the use of Chambers Wharf as a drive site will result in very significant harm to the living conditions of residents and schools located in close proximity to the site along with highways safety and capacity issues.

1.6.2 Abbey Mills is clearly less constrained than Chambers Wharf, it is located much further away from residential properties and schools, and has ample space for the layout of site operations and storage. The impacts from road traffic would also be less significant than at Chambers Wharf.

1.6.3 At Chambers Wharf, not only are residential properties located in much closer proximity to the site, but there are approximately four times as many people residing within 400m of the site at Chambers Wharf than within the same distance at Abbey Mills.

1.6.4 The only criterion on which the applicant claims Abbey Mills is less appropriate is barge access. However there is no proper justification of this conclusion, nor is there any proper consideration of other options for the removal of spoil either alone or in combination with barges. The weight given to this factor cannot override the other considerations, particularly the very serious harm to the area around Chambers Wharf. A separate study carried out on behalf of the Council has found that it would be feasible to transport the majority of the spoil by barge (at least 63%) subject to a requirement for additional dredging. The need for dredging would be outweighed by the benefits accruing from the switch in the direction of the tunnel drive.

1.6.5 The project should therefore be amended so that the tunnel is driven from Abbey Mills to Chambers Wharf (as proposed in Phase One of the applicant's pre-application consultation). Chambers Wharf would thus remain in use for the project, but only as a receptor site which would significantly reduce the intensity and length of works required at the site. Whilst adverse impacts would still result, these would be more manageable and more suited to the

constrained nature of this site within a high density residential area and in very close proximity to two schools.

1.7 Reduced impacts at Chambers Wharf as a receptor site

1.7 The use of Chambers Wharf as a receptor site only would greatly reduce the extent and duration of the works required at the site with corresponding benefits for residential amenity, the learning environment of school children along with highway safety and congestion.

1.7.1 In the event that Chambers Wharf is used as a receptor site (receiving tunnel boring machines from Abbey Mills, Kirtling Street and Greenwich) and not a drive site, the tunnel could still be constructed avoiding the need for a long drive and allowing for the use of alternative tunnel boring machines appropriate to the relevant geology.

1.7.2 Significantly, several benefits would accrue serving to reduce the impacts upon the area surrounding Chambers Wharf. These can be summarised as:

- A reduced site area would be needed and the site would be able to more comfortably accommodate the construction activities with consequently reduced impacts upon the surrounding area.
- The cofferdam would not be required preventing the impacts from its construction.
- The period of works would be significantly decreased.
- The overall impacts of noise upon the surrounding area would be significantly reduced.
- Vehicle movements in and out of the site would be significantly reduced.
- Site offices would be reduced in size, preventing day/sun light impacts on adjacent residential properties.

1.7.3 The extent and duration of the works would be reduced with corresponding benefits for residential amenity, the learning environment of school children and highway safety and congestion.

1.8 Summary of impacts at Shad Thames, Abbey Mills and Blackfriars Foreshore and mitigation required for these sites

1.8 Adverse impacts will also result from construction works at these other sites requiring significantly greater mitigation than currently proposed.

1.8.1 The proposed construction works at Shad Thames, Earl Pumping Station and Blackfriars Bridge Foreshore sites also have the potential to result in significant effects upon their surrounding areas and need to be very carefully mitigated in order to minimise impacts upon residents, office users (at Shad Thames) and local highway conditions.

1.8.2 These sites are located in close proximity to residential properties and the mitigation currently proposed in the draft requirements and obligations is not sufficient to address the impacts resulting from the construction works. At Earl Pumping Station a package of highway mitigation measures is also required in order to prevent serious impacts upon local highway conditions.

1.8.3 **Shad Thames:** Whilst the works at Shad Thames are of less magnitude than those at other sites such as Chambers Wharf, they still have the potential to cause significant disturbance to local residents, businesses and impact upon local highway conditions. Give the close proximity of both residents and officers to this site, particular concern is raised in relation to adverse impacts resulting from noise and vibration. Further mitigation and requirements are required beyond that currently proposed in the application.

1.8.4 **Earl Pumping Station** is located within the London Borough of Lewisham, but it is in close proximity to the boundary with Southwark including areas of residential properties. Significant impacts from noise would result for several residential properties adjacent to the site. Like the impacts at Chambers Wharf, the lack of detail within the application, the flexibility given to how the construction works will take place and the lack of appropriate mitigation extenuates this concern.

1.8.5 Significant traffic impacts would also result on roads within Southwark..
The Lower Road gyratory suffers from congestion at peak times and lacks resilience. Additional traffic from EPS will exacerbate this. Lower Road and Jamaica Road are busy with cyclists and Lower Road is a busy High Street with a high level of pedestrians with high levels of record collisions already recorded. This would again be significantly exacerbated by traffic from construction works, including the cumulative impacts of traffic from both Earl Pumping Station and Chambers Wharf.

1.8.6 Further mitigation and requirements are required in order to properly mitigate and control and the impacts upon residents and highway conditions.

1.8.7 **Blackfriars Bridge Foreshore:** Whilst located in the City of London, the works proposed at Blackfriars Bridge Foreshore also have the potential to affect Southwark's residents and roads if not properly mitigated against. Adverse air quality, noise and highway impacts are likely to result from construction vehicles being routed through Southwark. This will be extenuated by the cumulative impacts alongside the impacts from concurrent regenerations projects at the Elephant and Castle.

1.8.8 The Council also considers that, if not properly controlled and restricted, there is potential for adverse noise impacts upon Southwark residents on the opposite side of the River Thames.

1.8.9 Further mitigation and requirements are required in order to properly mitigate and control and the impacts upon residents and highway conditions.

1.9 Comments on detail of DCO provisions

1.9.2 The draft Order fails to strike the correct balance between the powers required for the project and the necessary limitations and controls on those powers. Generally in these areas it goes further than all granted development

consent orders. Thames Water ("TW") offers no detailed justification for the sweeping powers granted and disapplication of the pre-existing statutory limitations and controls. TW should set this justification out in full, together with explanation of how the interests of the various parties affected are protected. The Council has not received this information.

1.9.3 Examples of where the balance is wrong include:

- the definition of maintain,
- statutory nuisance provisions,
- various provisions deeming consent after the expiry of a period of time,
- powers to do works outside the Order limits,
- powers to do works in areas at the discretion of the undertaker (rather than areas specified in the Order),
- powers to take temporary possession of land, and
- the disapplication of legislative provisions.

1.9.4 It is not clear how all of the mitigation steps set out in the Environmental Statement and other application documents are effectively secured by the terms of the Order and section 106 obligations. TW should produce a detailed analysis of this on a project wide and site-by-site basis. This ought to act as a guide to all of the mitigation proposed, making it clear how each item of mitigation is secured.

1.9.5 As currently drafted the terms of the draft Order and plans are insufficient to secure the mitigation proposed in the application documents. That mitigation is itself inadequate for the impacts of the project.

1.9.6 The Order and application documents fail to adequately secure compliance with the terms of the Code of Construction Practice by contractors working on the project. The Council will require clear provision allowing it to enforce the terms of the Code against the undertaker in order to oblige it require compliance by the contractor in question.

2. Strategic Environmental Assessment

2.1 The council contends that a proper Strategic Environmental Assessment (SEA) has not been carried out of the options for dealing with London's sewerage problem including the alternatives to the preferred route for the tunnel now proposed in the DCO.

2.2 It is a mandatory requirement under Directive 2001/42/EC (hereafter referred to as the SEA Directive) (as transposed by the Environmental Assessment of Plans and Programmes Regulations 2004) for a SEA to be submitted with plans or programmes which are prepared for waste and/or water management schemes and set the framework for development consent of EIA projects. The absence of a proper SEA is a significant failing in that there has been no adequate assessment of the cumulative impacts of the development or an evaluation of the positive and negative impacts of the preferred tunnel scheme against other viable alternatives.

2.3 Article 5, section 1 of the SEA Directive states that "where an assessment is required by the Directive, an environmental report should be prepared containing relevant information (as set out in the Directive), identifying, describing and evaluating the likely significant environmental effects of implementing the plan or programme, **and reasonable alternatives** taking into account the objectives and the geographical scope of the plan or programme."

2.4 The council notes that the Assessment of Sustainability (AoS) prepared alongside the National Policy Statement (NPS) for waste water is considered to address the requirements of the SEA Directive in respect of the proposed Thames Tideway Tunnel. Section 2.3 of the Appraisal of Sustainability for the NPS itself states that the "consideration of the reasonable alternatives for a proposed policy or plan is a fundamental aspect of policy and planning development." Section 2.3 then goes on to consider alternatives to the NPS. However this is at a very high level and does not extend to the route of the tunnel itself.

2.5 Section 2.4 of the AoS claims to set out how there has been consideration of the reasonable alternatives to the Thames Tunnel Scheme. However there is no assessment of the alternatives against the 17 sustainability topics and objectives and 53 guide questions included in Appendix E and no proper SEA of the reasonable locational alternatives to the location specific Thames Tunnel Scheme contained in the NPS.

2.6 The AoS states at section 2.4 that the "Tunnel Work on identifying and assessing options to address polluting CSO discharges into the River Thames has been on-going since 2000, when the Thames Tideway Strategic Study (TTSS) group was established." The AoS goes on to state that "based on the previous options assessment work undertaken, in July 2006 the Government requested that Thames Water provide a detailed assessment of two preferred options:

- Option 1 – A 30km long tunnel to intercept and contain overflow discharges along the length of the tidal Thames, from the Hammersmith vicinity in west London to Beckton in the east and convey the waste water for secondary treatment to Beckton STW.

- Option 2 – Two separate, shorter tunnels comprising a west tunnel (with pump out to the existing sewer network) and an east tunnel, to intercept and contain the overflow discharges along these stretches of the river. Collected waste water to be conveyed to Beckton and Crossness STW for secondary treatment.

2.7 As a result of the assessment of these two options, DEFRA considered that Option 1 addresses all unsatisfactory CSOs along the Tidal Thames and River Lee.

2.8 The council considers that these options should have been subject to an SEA. Without the detailed assessment of these two options the decision to proceed with option one is legally flawed and could result in an unsuitable proposal with serious detrimental impacts across London. The council considers that alternatives considered prior to the 2006 assessment (and after the SEA Directive coming into force) should also have been subject to the SEA requirements. At any point where alternatives were discounted and options where not carried through to the next assessments, an SEA should have been undertaken.

2.9 The fact that there is no assessment of alternative locational options to the Thames Tunnel set out in Appendix E of the AoS for the NPS is a serious flaw in the process. It is not appropriate to disregard reasonable alternatives explored at these early stages without a full SEA of each option being undertaken. Moreover, the assessment that has been done is out of date and is not an adequate basis for lawful decision making in relation to the DCO.

2.10 The council has sought legal advice on this issue (attached as appendix 1) from Pinsent Masons LLP dated 20 September 2013. A copy of this advice has been sent to Thames Water and the Planning Inspectorate. This advice confirms the council's assessment that the NPS AoS has been inadequate at meeting the requirements of the SEA directive. The legal advice states that the SEA requires the assessment of reasonable alternatives. Whilst as assessment of alternatives was carried out for the NPS, it was insufficient to satisfy SEA requirements because;

- Route alternatives for the TTT were not assessed and consulted on at the time of consultation on the draft NPS; and
- The assessment of alternatives that did take place at the time was inadequate, with insufficient justification of selected options.

2.11 The legal advice also states that, even if the route alternatives had been consulted on for the AoS, the information (from 2006) would have been out of date.

2.12 Given the failure to adequately address the requirements of the SEA Directive and the Aarhus Convention, it is considered that DEFRA should re-consult on the NPS showing proper assessment of reasonable alternatives including TTT route selection. This could be done in parallel with any re-consultation on other changes to the DCO application. Another possible alternative in the DCO application process may be to give no weight to the NPS.

3. Inadequate pre-application consultation

3.1 The council considers that the pre-application consultation has been neither effective nor meaningful.

3.2 Over a period of approximately three years, the applicant has procedurally carried out consultation steps pursuant to the relevant sections of the Planning Act and has also carried out further informal engagement with the council and other consultees including local residents. However, in order for consultation to be adequate it is essential that the applicant makes sufficient information available to allow consultees to properly understand the proposals.

3.3 The Consultation Report Executive Summary (Doc Ref 5.1) sets out in sub-section 1.4 the scope of each stage of the pre-application process. Table 1.1 sets out what was consulted/engaged on. The council considers that this table is misrepresentative of the consultation process. Table 1.1 states that during the Phase One public consultation stage, the alternatives to the tunnel solution were consulted on. Table 1.1 also states that at the Phase two public consultation stage, the need for the project, including whether a tunnel is the most appropriate solution was an issue for consultation. However, the need for the tunnel and the appropriateness of the tunnel solution was previously consulted on through the draft NPS in November 2010. By the time the Phase two consultation commenced (November 2011), the NPS was already going through its final stages of Parliamentary approval and therefore the council considers that at this stage there was very little scope to comment on the need for the tunnel or the appropriateness of the tunnel solution.

3.4 Furthermore, neither the applicant nor DEFRA have set out how the consultation responses on the draft NPS have been taken into account during the preparation of the TTT documents or vice versa. Phase one consultation was carried out alongside the draft NPS consultation. Given the overlap in the content of these plans, the closeness in timescales raises a question over the meaningfulness of the TTT consultation, if the NPS is to be the only document to effectively consider the assessment of alternatives, it was therefore not a matter for the TTT Phase One public consultation, which should have been carried out after the adoption of the final NPS rather than at the same time as the draft NPS. The timescales also raise the question as to whether the consultation carried out by TTT especially at Phase Two public consultation was partly centred around issues that had already been determined (subject to Parliamentary approval).

3.5 It is clear from the documentation submitted with the Development Consent Order that a considerable amount of work has been undertaken to assess site suitability that has not been made available to the council. It is a requirement of the Planning Act that planning for major infrastructure projects is a front loaded process and LPA's should have early engagement and input into the development of the scheme. The inadequate information available means that that this opportunity has not been provided through the pre-application stage of the Thames Tideway Tunnel and that this has been to the detriment of our local residents. This is considered further in section 3.

3.6 Thames Water has failed to give adequate consideration to the representations made. The council has continued to raise objection to the

use of Chambers Wharf as a main tunnel drive site however these concerns have been ignored by Thames Water to date. The consultation report shows a significant objection to the use of the site. During phase two consultation three petitions were received with a total of 9582 signatories. This is the third highest number of objections received for any of the sites along the proposed route.

3.7 Section 27 of the consultation report summaries the responses received to the use of Chambers Wharf and Thames Water's response to these concerns. The council considers that Thames Water have failed to properly respond to concerns raised at every stage of the pre-application process. Table 27.14 sets out the objections, issues and concerns received at Section 48 publicity. The council submitted detailed comments on the proposals during the phase one, phase two and section 48 publicity stages. For example, in table 27.17, section 27.6.10, the council's comments have been summarised to a bullet point list including: effect of residential amenity, risk to local children, exacerbate existing traffic problems. Many of the detailed concerns raised by the council have been responded to with the very general statement that "*Based on our assessments, which have been carried out in accordance with the Site Selection Methodology paper we considered, on balance, Chambers Wharf is the most suitable site. Details of our site selection process including short listed sites considered and the reasons why we considered Chambers Wharf the most suitable site are set out in Vol 18 of the Final Report on Site Selection Process."*

3.8 The council has expressed significant concern and requested further information on the site selection methodology described in Vol 18 and therefore does not consider that this response adequately addresses the concerns raised.

3.9 The Consultation Report Executive Summary (Document reference 5.1) also states in Paragraph 1.33.4 that "Further investigation also found that it would be difficult to drive the main tunnel from Abbey Mills Pumping Station." However, no detail as been provided to LB Southwark setting out what further investigation was carried out and why it was considered that it would be difficult to drive the tunnel from Abbey Mills. The Council is extremely concerned that this lack of information has prejudiced our ability to consider the appropriateness of the option presented in the DCO, especially when the use of Abbey Mills Pumping Station as a drive site was presented as the preferred option by Thames Water during the phase one public consultation in September to December 2010.

3.10 The Consultation Report, Section 27 summaries the consultation carried out for the site at Chambers Wharf. Table 27.5 sets out the objections, issues and concerns received at phase one consultation. This table sets out how LB Southwark asked for further justification to be provided about the site selection methodology. Thames Water responded only to state that "in response to feedback received at phase one consultation and a material change in circumstances that came to light we determined to progress a different site for our proposed works." No further information was provided on the site selection methodology being used to identify the sites.

3.11 Table 27.5 summaries five key points made by the Council during the Phase one public consultation. The Council feels that this does not truly reflect or

respond to all the issues raised in the council's letter of response (attached as appendix 2).

3.12 Table 27.7 sets out the objections, issues and concerns received during the interim engagement which included a change in the preferred site from Kings Stairs Gardens to Chambers Wharf. As stated in the Consultation Report Executive Summary, paragraph 27.3.26 of the Consultation Report Section 27 states that *"Following interim engagement, we considered the feedback received and undertook further technical work. Part of our technical work included a review of our tunnelling strategy for the eastern section of the project. Chambers Wharf is constrained by site size and programme limitation, so can only support one tunnel drive. Further investigation also found that it would be difficult to drive the main tunnel from Abbey Mills Pumping Station.* However, no detail as been provided to LB Southwark setting out what further investigation was carried out and why it was considered that it would be difficult to drive the tunnel from Abbey Mills. The Council is extremely concerned that this lack of information has prejudiced our ability to consider the appropriateness of the option presented in the DCO.

3.13 The Consultation Report, Section 27 summarises the consultation carried out for the site at Chambers Wharf. Table 27.9 sets out the objections, issues and concerns received at phase two consultation.

3.14 Table 27.9 summaries 13 key points made by the Council during the Phase one public consultation. The Council feels that this does not truly reflect or respond to all the issues raised in the council's letter of response (attached as appendix 3).

3.16 Insufficient background information has been provided during the pre-application stages on the reasons for the selection of Chambers Wharf as a main drive site and no clarification has been given on the weighting given to each of the site selection criteria. This has made it extremely difficult for consultees to properly engage on what is a crucial issue with very significant resulting impacts. It means that consultation has been neither effective nor meaningful. Ultimately this poor standard of consultation has led to the wrong decision by Thames Water in its selection of Chambers Wharf as a drive site and inadequate mitigation of impacts at Shad Thames and Earl Pumping Station sites and Blackfriars Bridge Foreshore.

4. Thames Water's methodology for construction site selection is opaque and flawed

4.1 The council considers that the information made available concerning the site selection process has not been sufficient to allow either the council or residents to come to an informed view on the site selection process. Information both on methodology used to balance impacts against benefits in the site selection process impacts and on the impacts themselves has been inadequate. This means that neither the council nor residents have been able to properly engage in the process. The lack of appropriate information during the pre-application stages and within the application itself has resulted in a flawed and inadequate site selection.

4.2 The council previously raised concerns with the Site Selection methodology in our Phase One consultation response, sent to Thames Water on 12 January 2011. This response stated that the methodology used to select the preferred sites was far from clear and there was no attempt to use an appropriate weighting mechanism to compare shortlisted sites and evaluate impacts which in turn would inform the sequential approach to site selection. The council urged Thames Water to reconsider the selection of sites using a systematic and transparent mechanism for assessing the impacts. Many residents of Southwark also raised similar concerns that sufficient information had not been forthcoming from the applicant on the site selection process making it impossible to properly comment on the proposals.

4.3 The council's response to the Section 48 Publicity again highlighted our concerns with the Site Selection methodology. The response, sent to Thames Water on 5 October 2012, stated that the council remained unsatisfied that the site selection process followed by Thames Water had been transparent or consistent. The process, described in section R.2 of the Section 48 Report on site selection process (Volume 5 / Eastern site Appendices R to W) involved the creation of a long-list, assessment of long-listed sites to create a short-list, preparation of an engineering options report and assessment by way of a multi-disciplinary optioneering workshop.

4.4 Chambers Wharf was included on the original long-list of sites but then excluded from the short-listed sites. At the phase one public consultation stage, Abbey Mills Pumping Station was identified as the preferred site for either a main tunnel shaft or reception site. Thames Water stated that the tunnelling strategy, as described in the phase one consultation, was informed by the Engineering Options report (Spring 2010). The reasons for the original identification of Abbey Mills Pumping Station as the preferred site are set out in paragraph W.2.50 of Appendix W (Report on Site Selection Process) and include the fact that Thames Water owns the land and that the site could be developed in accordance with planning policy. Paragraph W.2.55 reiterates that at the phase 1 public consultation stage, Thames Water's view was that Abbey Mills Pumping Station is owned by Thames Water and "should be utilised as far as is reasonably practical".

4.5 In order to assess the suitability of sites, Thames Water used the criteria identified in Table 2.2 of the Site Selection methodology paper (engineering, planning, environment, socio economic and community and property) Volume 2 of the Final Report on site selection process (Appendix A). However, it remains far from clear why in subsequent phases of consultation Thames

Water selected Chambers Wharf, rather than Abbey Mills, as its main drive site. The only area in which the outcome of the assessment favours Chambers Wharf appears to relate to transport, in that with the extension of the jetty, it has the capacity to accommodate larger barges than Abbey Mills. This one factor appears to have overridden all other positive attributes of Abbey Mills pumping station.

4.6 In response to the concerns raised by the council and residents during the phase two consultation, Thames Water indicated that it recognised that given the locations in which it is seeking to construct and operate the tunnel, many of the shortlisted sites are constrained (main report on Phase two consultation, table 22.4). However, it remains unclear how Thames Water has evaluated the criteria it set out in the site selection methodology paper and how Thames Water has balanced the factors which have resulted in Chambers Wharf being identified as the most suitable site for a main tunnel shaft against other factors such as the impact upon local amenity, schools and residential living conditions.

4.7 Problems with the methodology include:

4.7.1 The "multidisciplinary sieving approach". Paragraph 1.4.2 of the Final report of site selection process, volume 18 refers to a “sieving approach” used to identify potentially suitable areas of land. Paragraph 1.4.2 also refers to a “multidisciplinary approach that took into account engineering, planning, environmental, community and property considerations and our (Thames Waters’) teams’ professional judgement.” This ‘multidisciplinary sieving approach’ was used to assess all the sites prior to phase one consultation. During phase one consultation, the council raised significant concern over the transparency and appropriateness of the multidisciplinary sieving approach. Despite the council’s objections, the same approach was used to ‘back-check’ the long list of sites for the phase two consultation. Thames Water have continued to use the same approach throughout the pre-application process without providing any additional information to support the weighting of the criteria used in the process.

4.7.2 There has been inadequate information on how this approach actually operated. No details have been provided of how the ‘optioneering workshops’ undertaken by the applicant to inform site selection have weighted each of the relevant selection criteria and what methodology was used for site selection. These workshops are referred to at Paragraphs 1.4.2 (decision to retain site on short list) and 2.5.6 (identification of the most suitable main tunnel site from the shortlisted sites) and section 3.4 (selection of phase 2 preferred site) of the Final report of site selection process, volume 18, sets out how the phase two preferred site was identified. For example, paragraph 3.4.4 simply states that “on the basis of the assessments described above, the tunnelling comparisons and professional judgement, it was agreed by all disciplines that Chambers Wharf would be the preferred main tunnel drive site."

4.7.3 The criteria applied for site selection were too general to allow a proper assessment of sites by Thames Water or the testing of that assessment by the council and consultees. Sections 2.4 and 3.3 of the Final report of site selection process, volume 18, set out how the short listed sites were assessed as either, suitable, less suitable or not suitable against the five different categories that make up the ‘multidisciplinary’ approach at final and

phase one back checking stages respectively. However, it is far from clear how the sites have been evaluated as suitable, less suitable or not suitable. There is no prescribed methodology for the assessment set out in the Final report of site selection process.

4.7.4 As well as this lack of information on methodology, insufficient information has been submitted by Thames Water on actual impacts. The lack of provision of key environmental and other information regarding important elements of the project has meant that it has not been possible for participants to give proper consideration to matters such as site selection and the controls and mitigation that would be required to protect the areas around the sites. For example:

4.7.5 Relevant information on matters such as those affecting local schools, archaeology and health impacts has not been forthcoming making it difficult for participants to properly comment in a way which can help to influence the development proposals.

4.7.6 Paragraph 1.4.2 of the Final report of site selection process, volume 18 refers to the site suitability reports that were prepared for each of the sites included on the final short list. The council has only been able to review the report for sites in Southwark. All site suitability reports for every site along the length of the tunnel that is included on final short list should be made available for review. This is necessary to enable proper assessment and testing of decisions on alternatives. In the case of Southwark, this requires assessment of sites outside its area, for example Abbey Mills in Newham.

4.7.7 Paragraph 1.4.2 of the Final report of site selection process, volume 18 sets out the site selection process following the phase one consultation. In bullet point d and e of this paragraph, an engineering options report – Abbey Mills Route (Summer 2011) is referred to. A copy of this document has not been made available to the council.

4.7.8 Ultimately this lack of information on comparative impacts and methodology used to assess them means that Thames Water's reasons for the selection of Chambers Wharf as a drive site are inadequate. Paragraph 3.4.10 of the Final Report of Site Selection Process (Volume 18) sets out the key reasons for selecting drive option C, i.e. to drive the eastern section of the main tunnel from Chambers Wharf to Abbey Mills Pumping Station and the drive the connection tunnel to from Greenwich pumping station to Chambers Wharf. The reasons given are that;

a. Further technical work and discussions with the Lee Tunnel project team showed that transporting materials to and from the site by the River Lee and Bow Creek was at worst not feasible and at best highly undesirable.
b. At Chambers Wharf, 1,500 tonne or potentially larger barges could be used on the River Thames to remove excavated material produced by the main tunnel drive site, whereas at Abbey Mills Pumping Station there were more constraints in using Bow Creek to remove excavated material due to the fact that only small 350 tonne barges could be used during a short tidal window. Even smaller barges were used for the Lee Tunnel project. Having smaller capacity barges increases the number required, which would add considerable complexity and risk.

c. Using Chambers Wharf as the main tunnel drive site would avoid the need to construct campshed and wharf facilities in Channelsea river, which would avoid the potential health and safety risks associated with moving the contaminated materials in the river bed. It would mean less impact on the foreshore ecology and water resources at Abbey Mills.
d. Driving the connection tunnel from Greenwich would mean that the main tunnel could be driven from Chambers Wharf, which would allow excavated materials from the larger main tunnel to be removed by river.

4.7.9 With regard to point a) the council has received no information to date on the "discussion with the Lee Tunnel project team". Abbey Mills was Thames Waters' own preferred drive site during phase one consultation, Thames Water have not demonstrated that transporting materials to and from the site by the River Lee is "not feasible."

4.7.10 With respect to point b, Thames Water has offered no detailed information on the comparative impacts of using barges at Chambers Wharf and Abbey Mills. They also failed to demonstrate through the site selection process how the use of barges outweighs the other factors considered through the site selection methodology including but not limited to the impact on residential amenity and Chambers Wharf.

4.7.11 In regards to point c, no evidence has been provided to demonstrate that construction of the campshed and wharf facilities would give rise to any potential health and safety risks that could not be appropriately mitigated against or to compare those impacts against those of the proposed cofferdam construction at Chambers Wharf.

4.7.12 Point d simply restates point b.

4.7.13 These points have been carried through to the assessment of the drive strategies in paragraphs 5.56 to 5.516 of the Final report of site selection process, volume 18. The council considers that this assessment is fundamentally flawed for the reasons outlined above.

4.7.14 Given these gaps in information regarding the site selection process and the site suitability assessments, the council has requested the following additional information from Thames Water in a letter dated 23 May 2013:

a) Final report on site selection process

- Further technical studies referred to in paragraph 6.6.22 of the final report on site selection process.
- Details of optioneering workshops held referred to in paragraph 3.7.3 (part c) of the final report on site selection process.
- Work on the use of the River Lee for barge transportation referred to in paragraph 5.2.3 (part e) on the final report on site selection process;

b) Final report on site selection process – volume 18

- The full site suitability reports prepared for both Chambers Wharf and Abbey Mills referred to in paragraph 3.3.20 of the final report of site selection process, volume 18.
- Engineering options report for the Abbey Mills route, spring 2012 and summer 2011. As mentioned in paragraph 4.2.4 of the final report of site selection process, volume 18.

c) The original report selecting Abbey Mills as a drive site for Phase 1 Consultation

5 Summary of impacts on Chambers Wharf as a drive site

5.1 Chapter 3 of the Council's Local Impact Report sets out full details of the impacts of the works at Chambers Wharf upon the surrounding area. It concludes that the site is wholly unsuitable as a drive site and will result in significant harm to the area, including noise, air quality, highway safety and traffic impacts. The site is very constrained by its proximity to sensitive receptors including many residential properties directly adjacent to and facing the site, along with three local schools, two of which are located in very close proximity to the site.

5.2 The site is located in heavily populated residential area, as well as properties immediately adjacent to three sides of the site, there are several hundred more properties within the wider vicinity of the site along with businesses and community facilities. The Thames Path runs along side the site via Chambers Street which is also very well used by pedestrians, joggers and cyclists.

5.3 Taking account of its sensitive location, the proposed works on this constrained site, along with related traffic and barge activity, taking place over a period of six years or more and seeking to involve 24 hour working for long periods, will result in significant harm to the amenities, residential living conditions and the schools in the vicinity of the site.

5.4 Proposed construction traffic including HGV movements (up to 110 per day) and other light vehicle movements raise serious concerns with regard to road and pedestrian safety. The uncertainty of the applicant's commitment towards barge movements means that these movements could increase further, with severe knock-on effects for the living conditions of residential properties, schools (particularly Riverside Primary School) and local highway conditions.

5.5 The cumulative impacts on the area around the site should not be underestimated. The very close proximity to sensitive receptors, the long construction period and the unsatisfactory mitigation provided, coupled with a combination of the recognised impacts including those resulting from noise, air quality, visual amenity and highway safety means that residents and school children will experience significant harm to their living and learning environment for several years. Such an impact will be compounded by the fact the project is likely to follow two years of construction works currently taking place on an adjacent site (180 dwellings) and will be followed by a further two to three years of construction works on the permitted residential development (407 dwellings) on the site itself.

5.6 The concerns over the impacts of the construction activities on the surrounding area are exacerbated by the lack of detail and certainty within the application proposals regarding the layout and operation of what will be a long term construction site. There currently exists far too great an amount of flexibility as to how the construction process will unfold, and the layout of the site for each construction phase, creating the potential for greater than necessary impacts and significant uncertainty for local residents and schools.

5.7 The site at Chambers Wharf is not large enough to contain all the required construction activities and operations without resulting in significant impacts upon the surrounding area. There is not an opportunity to provide the

appropriate amount of space within the site for storage, equipment, office/welfare buildings, vehicle manoeuvring and parking space without adverse impacts resulting. The need to construct an extensive coffer dam to provide barge access will result in further significant noise and transport impacts.

5.8 The proposed mitigation measures included within the draft requirements and planning obligations accompanying the application are wholly inadequate to provide any meaningful protection for local residents, schools and highway users. The applicant's inability to provide appropriate mitigation measures to mitigate the detrimental effects of the construction works demonstrates the inappropriateness of Chambers Wharf as a main drive site.

5.9 Abbey Mills is clearly a superior site from which to drive the tunnel (as set out in the Borough Council's Written Representation) and would result in significantly less environmental impact than at Chambers Wharf. The application should be amended so that Chambers Wharf is only used as a receptor site which, with appropriate mitigation, would reduce the impacts at Chambers Wharf to acceptable levels.

5.10 Notwithstanding the council's objections to the use of Chambers Wharf as a drive site, should the Panel decide that it should remain as a drive site, much more effective mitigation, including off set of impacts, must be secured. This should include a package of DCO requirements and obligations to mitigate the adverse impacts of the development on a wide range of matters including in relation to construction works and impacts, residential living conditions, visual amenity, local schools and quality of learning environment, heritage, community facilities, transport and sustainability, employment, local procurement, public realm, other community impacts and costs of administration and monitoring. Should the application be amended so Chambers Wharf is a drive site, a significantly improved package of mitigation would still be required.

6 Assessment of Abbey Mills as a Drive Site

Site Context

Ownership

6.1. *Abbey Mills*
The entire site is on existing Thames Water land and is adjacent to the existing Abbey Mills Pumping Station.

6.2 Consequently, there are no land ownership issues that would arise from the use of the site as a drive site.

6.3 *Chambers Wharf*
The land within the site is owned by Thames Water (it is believed that there is an agreement to sell the land to St James Group Limited for residential development following completion of the works). An area of foreshore is understood to be Crown Land and the river bed is owned by the Port of London Authority.

6.4 *Conclusion*
The ownership of the Chambers Wharf site is therefore more complex than at Abbey Mills, although there does not appear to be any significant impediment in this regard, notwithstanding the fact that the implementation of the extant planning permission for 300 much needed homes will be delayed for at least six years because of the proposed construction works.

Size of Site

6.5 *Abbey Mills*
The size of the Abbey Milles site as proposed in the DCO is 3.7 hectares.
This additional space in comparison to Chambers Wharf will provide more room and flexibility for the layout of construction activities on the site including storage, temporary buildings, parking and vehicle manoeuvring areas.

6.6 The details available at Phase One consultation stage, where Abbey Mills was proposed as a drive site, show how a drive site layout could be arranged on the site. It has never been suggested by the applicant in any document that the size, orientation or shape of Abbey Mills is unsuitable for use as a drive site.

6.7. The existing site is of sufficient size for use as a drive site. There is room for storage, parking and necessary construction activities to be comfortably located away from sensitive receptors such as residential properties.

6.8 As adjacent land is also under the ownership of Thames Water, there is also future provision for additional areas of land to be used as a safeguard in the event that this be required for logistical or practical reasons.

Chambers Wharf

6.9 In comparison, the site at Chambers Wharf is significantly smaller than Abbey Mills, measuring only 2.8 hectares. This includes the area of the cofferdam which will require extensive additional construction activity with the significant environmental impacts.

6.10 Even with the cofferdam, the site is restricted in size resulting in the need for construction activities to take place in close proximity to residential properties. The site layout is squeezed with little space for the parking, waiting and manoeuvring of vehicles. There is also no space available for overflow storage of materials.

Conclusion

6.11 This limitation of space for construction activities, storage, parking and vehicle manoeuvring, coupled with the very close proximity of sensitive receptors including residential, schools and businesses makes Chambers Wharf inferior for use in comparison to Abbey Mills as a drive site.

Demolition

Abbey Mills

6.12 This demolition includes small buildings and structures along with walls and fences. This limited demolition would result in little or no environmental impact.

Chambers Wharf

6.13 This demolition includes the existing river wall and part of existing jetty, electricity sub station, underground structures, walls and fences. This would result in only minor and short term disturbance to the surrounding area.

Conclusion

6.14 The demolition required at either site would need to take place for any proposed use of the site, be it as receptor or drive sites. The sites are therefore equal in this respect.

Designations

Abbey Mills

- Within the Three Mills Conservation Area
- Within an Archaeological Priority Zone
- Within an Air Quality Management Area
- Several of the buildings within the adjacent Abbey Mills Pumping Station complex are Listed.
- Adjacent watercourses are designated as sites of Nature Conservation Importance

Chambers Wharf

- Within an archaeological priority zone
- Within the Thames Policy Area
- The River Thames is within a site of Nature Conservation Importance
- Potential to affect the setting of the St Saviours Dock, Tower Bridge, Edward III's Rotherhithe & Wapping Pierhead Conservation Areas.

The implications for these designations are set out below.

Residential

Abbey Mills:

6.15 The site is not directly adjoining residential properties. Whilst the nearest residential properties on Bisson Road and Riverside Road are located approximately 20 metres from the site, they need not be adjacent to the noisiest elements of construction on the site. The main construction activities will be located approximately 140 metres from the nearest residential properties and 300m from the shaft works.

6.16 Residential properties are located on Gay Road and Abbey Road adjacent to the proposed vehicular access route to and from the site.

6.17 According to the 2011 Census approximately 1,100 people live within a 400m distance of the site[1].

Chambers Wharf

6.18 There are 140 existing homes either adjacent to the site or within 20 metres of the edge of the site. A further 180 affordable homes are currently being constructed adjacent to the site on the south side of Chambers Street.

6.19 Additional residential properties are located along Bevington Street adjacent to the proposed vehicular access road to and from the site.

6.20 According to the 2011 Census approximately 3,824 people live with 400m of the site[2]. This is likely to increase by at least a further 500 people following the occupation of the 180 affordable dwellings currently under construction to the south of the site on Chambers Street.

Conclusion

6.21 Abbey Mills is significantly less constrained than Chambers Wharf in terms of both its proximity to residential properties and the number of residential properties within the vicinity of the site. At Chambers Wharf there are approximately four times as many people residing within 400m of the site than at Abbey Mills.

Schools

Abbey Mills

6.1.1 Abbey Lane Sure Start Children's Centre is located on Abbey Lane, close to its junction with the A118 over 200m to the north of the site.

Chambers Wharf

6.1.2 Riverside Primary School is located 50m from the site on Bevington Street. St Michaels Secondary School is located approximately 25m from the south west corner of the site. St Josephs Primary School is located on Georges Row approximately 200m south west of the site.

Conclusion

[1] 2011 Census Output Areas E0018243, E00018220, E00175081 and E00175077

[2] 2011 Census Output Areas E00020257, E00020273, E00020274, E00020280, E00020282, E00020284, E00167678, E00168006, E00020277, E00020269, E00166641 & E0002028.

6..1.3 Abbey Mills is significantly less constrained than Chambers Wharf in terms of its proximity to local schools.

River Access for Transportation of Materials

Abbey Mills

6.1.4 As a receptor site, the application does not propose to transport any material by barge. This is in spite of the site being located next to the River Lee, and in spite of access for barges to transport materials being considered as a distinct advantage of the site when it was proposed as a drive site in the applicants phase one consultation.

6.1.5 The application[3] suggests reasons why it is no longer feasible to use the River Lee for barge transport:

- Further technical work and discussions with the Lee Tunnel project team showed that transporting materials to and from the site by the River Lee and Bow Creek was at worst not feasible and at best highly undesirable.

- At Chambers Wharf, 1,500 tonne or potentially larger barges could be used on the River Thames to remove excavated material produced by the main tunnel drive site, whereas at Abbey Mills Pumping Station there were more constraints in using Bow Creek to remove excavated material due to the fact that only small 350 tonne barges could be used during a short tidal window. Even smaller barges were used for the Lee Tunnel project. Having smaller capacity barges increases the number required, which would add considerable complexity and risk.

- Using Chambers Wharf as the main tunnel drive site would avoid the need to construct campshed and wharf facilities in Channelsea river, which would avoid the potential health and safety risks associated with moving the contaminated materials in the river bed. It would mean less impact on the foreshore ecology and water resources at Abbey Mills.

- Driving the connection tunnel from Greenwich would mean that the main tunnel could be driven from Chambers Wharf, which would allow excavated materials from the larger main tunnel to be removed by river.

6.1.6 Little, or no further detail has been provided by the applicant in support of these factors, either during the pre-application process or as part of the application for development consent.

London Borough of Southwark's barge feasibility assessment:

6.1.7 The Council has commissioned Pell Frischmann to produce a detailed assessment to determine whether it is feasible to use the River Lee for the transportation of spoil materials from Abbey Mills and whether the site could be used as a drive site for tunnelling towards Chambers Wharf. This is attached to this representation as [Appendix 4][4]

[3] Volume 18 Para 1.4.2 of the Final report on site selection process.
[4] Pell Frischmann – The use of the River Lea for transportation of spoil materials Feasibility Study October 2013.

6.1.8 Pell Frishmann's assessment examines the possible transportation of the following materials by barge in connection with the use as Abbey Mills as a drive site:

- Excavated material from shaft construction, and
- Excavated material from main tunnel construction.

6.1.9 Based on a robust assessment that a peak tunnelling rate of 200m per week will be achieved equating to 4,400 tonnes of excavated material per day, the assessment concludes that:

- Taking into account the need for areas required for two days of stock piling, the area required for over 2 days of tunnel segment storage and a slurry treatment plant, the assessment demonstrates through a provisional site layout (page 16 of the assessment) that the existing site is suitably sized and shaped for a drive site incorporating barge access.

- Due to the tidal constraints of the River Lee and Bow Creek, dredging will be required along sections of the River Lee prior to the construction works.

- Once the dredging has been undertaken, it would be feasible that a waterborne logistics strategy could be created, so that during each Neap or Spring Tidal windows 4 x 350 tonne barges could serve the site. This would equate to a maximum disposal rate of 2800 tonnes of spoil per day, equivalent to 63% of excavated material.

- Should the tunnelling rate be increased beyond that proposed by the applicant (as is reasonably possible), this would allow all excavated materials to be removed by barge.

- The additional costs of infrastructure to enable river transport to serve Abbey Mills as a main drive site is estimated as being £12.8m.

6.1.10 The assessment therefore finds, following necessary dredging, it is feasible for barges to be used to transport material from the site. Even in the event that the expected 63% figure cannot be reached, other studies have demonstrated that it would be possible for the remainder of the spoil to be removed by road without resulting in significant impacts. Moreover, it would still be possible for the site to operate as a drive site without any barge access as the highway capacity is capable of absorbing the required number of vehicle movements without significant effects on the road network.

Chambers Wharf

6.1.11 Located adjacent to the River Thames, Chambers Wharf enjoys good access to the river, this being the only significant advantage of the site over Abbey Mills. This does, however, introduce an additional constraint as the application proposes the construction of a cofferdam to facilitate the barge access. This in itself results in an extensive construction operation involving significant impacts from noise, vibration, traffic movements, disturbance to the

river bed and dredging[5]. If Chambers Wharf was amended to a receptor site, the cofferdam is not considered to be required.

Compulsory Purchase

Abbey Mills

6.1.12 The need for compulsory purchase at Abbey Mills is low. The applicant's Statement of Reasons states at paragraph 10.31 "The works at Abbey Mills Pumping Station would take place upon land already owned and controlled by Thames Water with some minor works in the highway and the possibility of works in the Prescott Channel".

Chambers Wharf

6.1.13 A greater amount of Compulsory Purchase is required at Chambers Wharf in relation to Abbey Mills, affecting a significantly greater number of interests.

Conclusion

6.1.14 Given the greater amount of interests affected by Compulsory Purchase at Chambers Wharf, this is a further concern with the applicant site selection process. The Council also considers that, given the impacts from the site as drive site upon the surrounding area, the case for Compulsory Purchase in the public interest could only be supported if the drive direction is reversed with Chambers Wharf becoming only a receptor site.

Environmental Impacts at Abbey Mills as a Drive Site:

Archaeology

6.1.15 The archaeological impacts resulting from the use of the site as a drive site in comparison to that of a receptor site would not be significant. The excavation and ground disturbance required would not be appreciably greater. Provided the appropriate mitigation is carried out, the impacts would be negligible.

Built Heritage

6.1.16 The array of buildings, structures and machinery required should Abbey Mills be used as a drive site are similar to those that would be required for its use as a receptor site. These include cranes, hoardings, workshop buildings, welfare facilities (up to three storeys). Lighting will also be required for night time working. Thames Water may also decide to enclose the shaft to safeguard amenity which would result in an additional structure on the site.

6.1.17 The structures and buildings would also be required to be on site for a longer period time given the additional time period required for drive site construction works (6 years as opposed to 3-4 years). Mitigation through screening and landscaping would reduce impacts.

6.1.18 The impacts upon heritage receptors including the listed Pumping Station complex and the Three Mills Conservation Area would not be significantly greater than for the site's use as a receptor site and would remain as minor adverse as concluded in the ES.

[5] The Environmental Statement (Volume 20) is confusing with regards to the need for dredging at Chambers Wharf. Paragraph 3.2.5 (a) (i) states that dredging is included within the required works, whilst Paragraph 3.3.19 assumes that no dredging would be required.

Townscape and Visual

6.1.19 As described above, the array of buildings, structures and machinery required should Abbey Mills be used as a drive site are similar to those that would be required for its use as a receptor site. These include cranes, hoardings, workshop buildings, welfare facilities (up to three storeys). Lighting will also be required for night time working. Thames Water may also decide to enclose the shaft to safeguard amenity which would result in an additional structure on the site. Impacts would also result from clearance of the site along with barge and HGV movements.

6.1.20 The ES concludes that, as a receptor site, the construction works at Abbey Mills would result in moderate adverse townscape and visual impacts upon the site, Three Mills Green Townscape Character Area (TCA) and views from residential properties on Gay Road, the footpath at the confluence of the Channelsea River and Prescott Channel. The ES also concludes that a major adverse impact would result from views from Three Mills Green adjacent to the Prescott Channel.

6.1.21 The use of Abbey Mills as a drive site would lengthen the period of time that structures, buildings and activity are required on the site, would involve additional night time working requiring lighting and may result in the need for an enclosure over the shaft. Mitigation through screening and landscaping would reduce impacts. Whilst this would have some additional impacts on townscape and views around the site, these additional affects would not be alter the overall conclusions in the existing EA that significant adverse affects would result from the works.

Water Resources (Ground and Surface Water)

6.1.22 As a receptor site the EA concludes that the construction works at Abbey Mills will result in, at worst, minor adverse effects on local aquifers and surface water resources.

6.1.23 As a drive site, as the tunnel would be driven through chalk, there is likely to be a need for a slurry treatment plant in order to separate the excavated material from the slurry. However, with appropriate mitigation, the resulting impacts as a drive site would not be significantly different from its use as a receptor site.

Flood Risk

6.1.24 As a receptor site, the EA concludes that the construction works will lead to a low risk of flooding. Provided that appropriate mitigation and design measures are provided, the flood risks at Abbey Mills are unlikely to significantly change as a result of the use of the site being switched from a receptor to a drive site.

Air Quality

6.1.25 The EA concludes that, in the large majority of cases, the construction works for a receptor site would result in a negligible impact upon air quality, with minor adverse impacts in terms of construction dust for two residential properties (2 Riverside Road and 134 Bisson Road) along with West Ham allotments.

6.1.26 The use of the site as a drive site would extend the period of works and result in a further intensification of works at the site. However, the receptors

affected would remain very small (significantly less than for Chamber Wharf) and the overall impact would remain as minor adverse.

Noise & Vibration

6.1.27 The ES concludes that, as a receptor site, there will not be any significant impacts from noise and vibration upon any surrounding residential or non residential properties. This takes account of noise and vibration from both site construction activities and road based construction traffic. The assessment of noise from construction traffic is made on the basis that it is not proposed to use the river to transport materials and that during the peak construction period the traffic generation is forecast to average 70 HGV's per day, equivalent to 140 movements.

6.1.28 Southwark Council has commissioned Bureau Veritas to make an assessment of the impacts from noise and vibration should Abbey Mills be used as a drive site (the report is attached as appendix 5). The assessment includes a noise modelling exercise to enable a prediction of the effects of concurrent construction activities. This takes account of the type of activities and construction hours/periods required for a drive site which are obviously involve a greater intensity of construction and transport and longer working hours than its use as a receptor site.

6.1.29 It is pertinent to not that at Abbey Mills, the nearest residential properties will be at least 140m from the work site and 300m from the main shaft works. It is also relevant that, at the time of the Phase One consultation, where Abbey Mills was proposed as a drive site, Thames Water did not consider that noise would be a significant factor.

6.1.30 The three main stages of construction assessed are:

A) Main tunnel shaft construction (Years 1 and 2, daytime),
B) Main tunnel shaft construction, including continuous concrete pouring (Years 1 and 2, night-time), and
C) Tunnelling, including continuous concrete pouring (Years 2-4, nightime).

6.2.1 This assessment finds that:

- The predicted highest noise levels upon residential properties for Scenarios A and B, including day and nightime works, would be at properties on Riverside Road, but would be 'Not Significant'.
- The predicted noise levels for Scenarios A and B upon the nearest educations receptor are 'Not Significant'.
- For Scenario C, involving extended night time working hours for tunnel boring, including the operation of water/slurry pumps and slurry processing plant, the highest noise levels are predicted at residential receptors on Riverside Road, but these are low magnitude and would be 'Not Significant'.
- Based on an 'all by road' scenario, the impact of peak construction traffic noise on Abbey Lane and Gay Road for residential and educational receptors would be 'Significant'.
- However, should barges be used to transport the majority of excavated material, the number of HGV movements would be reduced to 28 per day (from 140 movements per day), and the noise impacts would not be significant.
- Construction site vibration impacts would be 'Not Significant'.

6.2.2 In conclusion, should Abbey Mills be used as a drive site, utilising barges to transport the majority of materials, the noise and vibration impacts to surrounding residential and educational receptors would not be significant. The noise levels at the nearest residential properties would be significantly less should Abbey Mills be used as a drive site than for Chambers Wharf as a Drive Site.

Socio-economics

6.2.3 As a receptor site, the EA concludes that there would be minor adverse impacts from the construction works on residential amenity (from dust effects and visual impacts for a very small number of properties), and a negligible impact on businesses and users of allotments adjacent to the site.

6.2.4 If used as a drive site, minor adverse impacts from both dust effects and visual impacts would result for a very small number of residential properties, not significantly different than for its use as a receptor site. Taking into account the use of barges to transport the majority of materials, the impacts from noise would be, at worst minor adverse, but most likely to not be significant depending on the proportion of materials that can be moved by river. Similarly, there are likely to be no significant impacts upon existing business and only minor adverse impacts on allotment users. Following responses received at Phase One consultation when Abbey Mills was proposed as a drive site, the applicant was confident that impacts on allotment users could be overcome.

Day/Sun Light

6.2.5 Given the significant separation distances from neighbouring residential properties there would not be any impacts upon the amount of day and sun light resulting from any on-site buildings or structures required in connection with the construction activities as a drive site.

Ecology

6.2.6 The ES concludes that, as a receptor site, using control measure the construction activities at Abbey Mills would result in negligible and moderately beneficial ecological impacts. There would be a temporary loss of habitat related to site clearance but this would be reinstated at the end of the construction.

6.2.7 As a drive site, the site area would remain very similar to that proposed for a receptor site. The applicants own assessment of the potential of using Abbey Mills as a drive site following its Phase One consultation concluded that the site was *suitable* from an ecological perspective [6]. Whilst there would be some risk of impacts upon foreshore ecology at Abbey Mills this, at worst, is likely to result in only minor adverse effects.

Land Quality

6.2.8 .As a receptor site, the EA concludes that the construction works at Abbey Mills would result at worst in minor adverse impacts though the EA notes that it is unlikely that the affects would occur.

[6] Paragraph 2.4.10 of Volume 23 of the Final Report on Site Selection Process (Doc Ref: 7.05)

6.2.9 Similar risks would be likely to result from the use of the site as a drive site, although the use of barges would be likely to result in the need to construct campsheds and wharf facilities in Channelsea River which would introduce further potential health and safety risks associated with moving the contaminated materials in the river bed [7]. However, using appropriate investigation, mitigation and controls, such risks would only be likely to result in minor adverse impacts and it is unlikely that adverse effects would occur.

Road Transport

6.2.10 As a receptor site the Environmental Statement and Transport Assessment concludes that there would be significant impacts upon the surrounding highway network or local highway conditions. This is based upon all materials being removed by road involving HGV movements of up to 140 per day.

6.2.11 The Council has commissioned Phil Jones Associates[8] to assess the highway impacts that would arise from using Abbey Mills as a drive site and whether Abbey Mills would provide a more suitable location for the drive site in comparison to Chambers Wharf. The full report is attached to this written representation as Appendix 5.

6.2.12 Based on the worse case 'All be Road' scenario of no barge access being available at Abbey Mills, its use a drive site would result in up to 570 HGH movements per day and 134 other construction vehicle movements (this is based on the figures provided in the application for Chambers Wharf as a drive site).

Impact on Highway Capacity

6.2.13 The capacity assessment concludes that the additional construction traffic in 'All by Road' scenario would have a slight adverse impact on the operation of the Abbey Lane/High Street junction but does not add significantly to the length of queuing or delays expected. The junction would continue to operate with spare capacity. It is pertinent to note that the applicants Transport Assessment reports that the local highway network operates satisfactorily with the addition of construction traffic associated with the Lea Tunnel currently being constructed.

Impact on Pedestrians and Cyclists

6.2.14 As is the case with Chambers Wharf, the increase in traffic would have some impact upon pedestrian amenity and levels of fear and intimidation. However, the pedestrian and cycle flows at Abbey Mills are significantly lower than at Chambers Wharf and the overall impacts upon pedestrians and cyclists at Abbey Mills would not be very significant, particularly in relation to those at Chambers Wharf.

[7] Paragraph 3.4.5 (c) of Volume 23 of the Final Report on Site Selection Process (Doc Ref.7.05)

[8] Phil Jones Associates – Thames Tideway Tunnel - Abbey Mills Alterative Drive Site Assessment - August 2013

Impact on Highway Safety

6.2.14 The impacts at Abbey Mills on highway safety are concluded to be insignificant. The additional

Conclusion on road transport

6.2.15 Based on the results of the assessment undertaken, locating the tunnel drive site at Abbey Mills will not have a significant impact on the operation of the highway network, even in the scenario that all construction materials are transported by road. The impacts of the construction traffic on the highway network surrounding the Abbey Mills site will also be significantly lower in the 'All by Road' scenario when compared to the anticipated impact if the tunnel drive site was located at Chambers Wharf.

6.2.15 Should a proportion of materials be able to be transport by barge, then the transport related impacts from using Abbey Mills as a drive site would be even less.

7 Comparative Assessment between Abbey Mills and Chambers Wharf

7.1 On the information contained in the application, Abbey Mills is clearly more appropriate as a drive site than Chambers Wharf. In particularly, the use of Chambers Wharf as a drive site will result in very significant harm to the living conditions of residents around the site and the learning environment of children at two schools located in close proximity to the site. The only criterion on which the applicant claims Abbey Mills is less appropriate is barge access. However there is no proper justification of this conclusion, nor is there any proper consideration of other options for the removal of spoil either alone or in combination with barges. The weight given to this factor cannot override the other considerations, particularly the very serious harm to the area around Chambers Wharf.

7.2 With regard to compulsory purchase, the Council would only consider there to be a compelling case in the public interest for compulsorily purchasing interests needed for a scheme at Chambers Wharf involving alternative drive direction and reduced impacts.

Table 1: Comparative impacts at Chambers Wharf/Abbey Mills as drive/receptor sites

	Chambers Wharf (Drive)	Abbey Mills (Receptor)	Chambers Wharf (Receptor)	Abbey Mills (Drive)
Archaeology	Negligable	Negligible	Negligable	Negligible
Built Heritage	Minor adverse	Minor Adverse	Minor Adverse	Minor Adverse
Townscape & Visual	Moderate adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse
Socio Economic	Major adverse	Negligable	Minor Adverse	Minor Adverse
Water Resources	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse
Flood Risk	Low	Low	Low	Low
Air Quality	Minor adverse	Negligible	Minor adverse	Negligible
Noise and Vibration	Major adverse	Negligable	Minor Adverse	Minor Adverse
Ecology	Minor Adverse/Moderate Adverse	Negligable/Minor Beneficial	Minor Adverse/Moderate Adverse	Minor Adverse
Land Quality	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse
Day/Sun Light	Major Adverse	Negligable	Minor Adverse	Negligable
Road Transport (Safety)	Moderate Adverse	Minor Adverse	Minor Adverse	Minor Adverse
Road Transport (Capacity)	Major adverse	Negligible	Moderate Adverse	Negligible
River Transport	Minor adverse	Minor adverse	Minor adverse	Moderate adverse

7.3 In the event that Chambers Wharf is used as a receptor site (receiving tunnel boring machines from Abbey Mills, Kirtling Street and Greenwich) and not a drive site the tunnel could still be constructed avoiding the need for a long drive and still allowing the use of alternative tunnel boring machines appropriate to the relevant geology. Significantly, several benefits would accrue serving to reduce the impacts upon the area surrounding Chambers Wharf. These can be summarised as:

- A reduced site area would be needed and the site would be able to more comfortably accommodate the construction activities with consequently reduced impacts upon the surrounding area.
- The period of works would be significantly decreased.
- The cofferdam would not be required preventing the impacts from its construction.
- The overall impacts of noise upon the surrounding area would be significantly reduced.
- Vehicle movements in and out of the site would be reduced.
- The extent and duration of the works would be reduced with corresponding benefits for residential amenity, the learning environment of school children and highway safety and congestion.
- The combined significant cumulative impacts at Chambers Wharf would be significantly reduced.
- With regard to compulsory purchase, the Council would only consider there to be a compelling case in the public interest for compulsorily purchasing interests needed for a scheme at Chambers Wharf involving alternative drive direction and reduced impacts.

7.4 The project should therefore be amended so that the tunnel is driven from Abbey Mills to Chambers Wharf (as proposed in Phase One of the applicant's pre-application consultation). Chambers Wharf would thus remain in use for the project, but only as a receptor site which would significantly reduce the intensity and length of works required at the site. Whilst adverse impacts would still result, these would be more manageable and more suited to the constrained nature of this site within a high density residential area and in very close proximity to two schools. Adequate environmental assessment information is available to allow this amendment.

8. Summary of impacts at Shad Thames, Abbey Mills and Blackfriars Foreshore

8.1 Detailed assessments of the impacts upon these sites is set out in the Council's Local Impact Report.

8.2 The proposed construction works at Shad Thames, Earl Pumping Station and Blackfriars Bridge Foreshore sites also have the potential to result in significant effects upon their surrounding areas and need to be very carefully mitigated in order to minimise impacts upon residents, office users (at Shad Thames) and local highway conditions.

8.3 These sites are located in close proximity to residential properties and the mitigation currently proposed in the draft requirements and obligations is not sufficient to address the impacts resulting from the construction works. At Earl Pumping Station a package of highway mitigation measures is also required in order to prevent serious impacts upon local highway conditions.

8.4 **Shad Thames:** Whilst the works at Shad Thames are of less magnitude than those at other sites such as Chambers Wharf, they still have the potential to cause significant disturbance to local residents, businesses and impact upon local highway conditions. Give the close proximity of both residents and officers to this site, particular concern is raised in relation to adverse impacts resulting from noise and vibration. Further mitigation and requirements are required beyond that currently proposed in the application.

8.5 **Earl Pumping Station** is located within the London Borough of Lewisham, but it is in close proximity to the boundary with Southwark including areas of residential properties. Significant impacts from noise would result for several residential properties adjacent to the site. Like the impacts at Chambers Wharf, the lack of detail within the application, the flexibility given to how the construction works will take place and the lack of appropriate mitigation extenuates this concern.

8.6 Significant traffic impacts would also result on roads within Southwark. The Lower Road gyratory suffers from congestion at peak times and lacks resilience. Additional traffic from EPS will exacerbate this. Lower Road and Jamaica Road are busy with cyclists and Lower Road is a busy High Street with a high level of pedestrians with high levels of record collisions already recorded. This would again be significantly exacerbated by traffic from construction works, including the cumulative impacts of traffic from both Earl Pumping Station and Chambers Wharf.

8.7 Further mitigation and requirements are required in order to properly mitigate and control and the impacts upon residents and highway conditions.

8.8 **Blackfriars Bridge Foreshore:** Whilst located in the City of London, the works proposed at Blackfriars Bridge Foreshore also have the potential to affect Southwark's residents and roads if not properly mitigated against. Adverse air quality, noise and highway impacts are likely to result from construction vehicles being routed through Southwark. This will be extenuated by the cumulative impacts alongside the impacts from concurrent regenerations projects at the Elephant and Castle.

8.9 The Council also considers that, if not properly controlled and restricted, there is potential for adverse noise impacts upon Southwark residents on the opposite side of the River Thames.

8.10 Further mitigation and requirements are required in order to properly mitigate and control and the impacts upon residents and highway conditions.

9 Conclusions

9.1 London Borough of Southwark Council objects to the proposals on the following grounds:

1. The basis for the application is legally flawed due to the failure to adequately identify reasonable alternative tunnel routes and properly justify the selected tunnel route. Previous assessments are out of date and do not provide an adequate basis for the lawful decision making in relation to the DCO.

2. Thames Water's pre-application consultation was ineffective, with no proper opportunity and inadequate information for consultees to influence the selection of Chambers Wharf as a drive site and mitigation of impacts at Shad Thames and Earl Pumping Stations and Blackfriars Bridge Foreshore. Inadequate consideration was given to the representations made.

3. Thames Water's methodology for construction site selection is opaque and flawed.All of this has led Thames Water to the wrong decision on the use of Chambers Wharf.

4. Chambers Wharf is not a suitable drive site. Unacceptable impacts would result, including upon local residents, schools and highway conditions.

5. Abbey Mills Pumping Station (Newham) is a clearly superior site from which to drive the tunnel. The application should be amended so that Chambers Wharf is only used as a receptor site.

6. If, in the opinion of the Panel, Chambers Wharf should remain as a drive site (which is strongly opposed and not accepted), significantly greater mitigation including offset of impacts is required, although that would still be considered inadequate.

7. Significantly greater mitigation is also required at the Shad Thames, Earl Pumping Station and Blackfriars Bridge Foreshore sites.

SCHEDULE OF APPENDICES

For the Written Representation of

London Borough of Southwark (Ref.10018659)

Application for Development Consent for the

Thames Tideway Tunnel

November 2013

Written Representation Schedule of Appendices

Appendix 1 SEA Legal advice from Pinsent Masons

Appendix 2 London Borough of Southwark's Phase One consultation response

Appendix 3 London Borough of Southwark's Phase Two consultation response

Appendix 4 Barge feasibility assessment

Appendix 5 Noise Assessment

Appendix 1 SEA Legal advice from Pinsent Masons

LONDON BOROUGH OF SOUTHWARK

THAMES TIDEWAY TUNNEL DCO APPLICATION

LEGAL ADVICE TO LONDON BOROUGH OF SOUTHWARK ON CHALLENGE TO NON-COMPLIANCE OF NPS WITH SEA DIRECTIVE

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1 EXECUTIVE SUMMARY

1.1 In coming to a decision on the Thames Tideway Tunnel ("TTT") Development Consent Order ("DCO") application, PINS must consider the Waste Water National Policy Statement ("NPS"). However, deficiencies in the Strategic Environmental Assessment ("SEA") of the NPS mean that a DCO made on the basis of the NPS will also be deficient and subject to legal challenge.

1.2 SEA requires the assessment of reasonable alternatives. Even though an assessment of alternatives was carried out for the NPS, it was insufficient to satisfy SEA requirements because:

1.2.1 route alternatives for the TTT were not assessed and consulted on at the time of consultation on the draft NPS; and

1.2.2 the assessment of alternatives that did take place at the time was inadequate, with insufficient justification of selected options.

1.3 On 1.2.1, the route alternatives were assessed in 2006 but that assessment was not consulted on as part of the Appraisal of Sustainability ("AoS") accompanying the NPS consultation. Only one route was considered in the AoS.

1.4 So the alternatives at the time of the NPS consultation had already been discounted without proper consideration through SEA. This is contrary to case law, which establishes that:

1.4.1 those alternatives and the reasons for selecting them should have been consulted on at the same time as the draft NPS (*Seaport*); and

1.4.2 consultation ought to be at a formative stage (*ex p Gunning*).

1.5 Even if the route alternatives had been consulted on for the AoS, the information – from 2006 – would have been out of date.

1.6 On 1.2.2, the AoS assessment of alternatives was itself insufficient because the AoS fails to assess them against the sustainability topics and objectives and guide questions contained in the AoS. Failure properly to justify the selection of alternatives (even where alternatives have been assessed) fails to satisfy the requirements of SEA, according to case law (*ex p Gunning*).

1.7 In relation to both points, these failures to satisfy EU law at the outset of the consenting process mean that subsequent decisions in that process are subject to challenge. The principles of effectiveness and sincere co-operation under EU law mean that this failure at the outset of the consenting process results in subsequent decisions – including the ultimate grant of the DCO – being susceptible to challenge. SEA requirements applied to the NPS but failure to satisfy them contaminates subsequent decisions on the basis of the NPS.

1.8 To correct the SEA breach, DEFRA should re-consult on the NPS, showing proper assessment of reasonable alternatives including TTT route selection. This could be done in parallel with any re-consultation on other changes to the DCO application.

1.9 A possible alternative in the DCO application process may be to give no weight to the NPS on the basis that it is founded on an unlawful SEA breach.

2 APPLICATION OF STRATEGIC ENVIRONMENTAL ASSESSMENT DIRECTIVE

2.1 The NPS sets out UK Government policy for the provision of major waste water infrastructure. It guides decision making on DCO applications for waste water developments and provides information on the waste water collection, storage and transfer tunnel referred to here as the "TTT".

2.2 The NPS was designated on 26 March 2012. EU law requires, under Article 3(2) SEA Directive, that before a plan or programme which establishes the framework for development consent is adopted, it should be subject to consultation alongside an environmental report which identifies, describes and evaluates the significant effects that its implementation is likely to have on the environment. The objective of the SEA Directive is to provide for a high level of protection of the environment and for environmental considerations to be integrated into the preparation and adoption of plans and programmes, with a view to promoting sustainable development.

2.3 Article 3(2) SEA Directive makes SEA mandatory for plans and programmes which:

2.3.1 are prepared for (among other purposes) waste management, water management, town and country planning or land use; and

2.3.2 set the framework for future development consent for projects listed in Annexes I and II to the Environmental Impact Assessment ("EIA") Directive (85/337/EEC) or which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of the Habitats Directive (92/43/EEC).

2.4 European Commission guidance on the *Implementation of Directive 2001/42 on the assessment of the effects of certain plans and programmes on the environment* (2003) states at paragraph 3.23 that plans and programmes which set the framework for future development consent of projects normally contain "criteria or conditions which guide the way a consenting authority decides an application for development consent". Development consent is defined in the EIA Directive as "the decision of the competent authority or authorities which entitled the developer to proceed with the project" (Article 1(2) EIA Directive). Accordingly, the NPS is a plan or programme for the purposes of the SEA Directive.

3 HAVE SEA DIRECTIVE REQUIREMENTS BEEN SATISFIED?

Overview of Requirements

3.1 ODPM publication "A Practical Guide to the SEA Directive" (September 2005) states at paragraph 2.3 that the SEA Directive requires an "environmental assessment" of certain plans and programmes, meaning (under Article 2(b) SEA Directive) a procedure comprising:

3.1.1 preparing an Environmental Report on the likely significant effects of the draft plan or programme;

3.1.2 carrying out consultation on the draft plan or programme and the accompanying Environmental Report;

3.1.3 taking into account the Environmental Report and the results of consultation in decision making; and

3.1.4 providing information when the plan or programme is adopted and showing how the results of the environmental assessment have been taken into account.

3.2 Paragraph 5.7 of the ODPM Guide states: "The methods outlined in this section and in the Appendices can be regarded as tools and techniques to be used to meet the requirements of the SEA Directive." The section then identifies steps in the SEA process which it considers should be taken in order to comply with the SEA Directive. Figure 5 describes "Stage B" of this process - "Developing and refining alternatives and assessing effects", which prescribes:

3.2.1 the development of strategic alternatives;

3.2.2 prediction of the effects of the plan or programme, including alternatives;

3.2.3 evaluating the effects of the plan or programme, including alternatives.

3.3 "Stage C: Preparing the Environmental Report" additionally requires presentation of "the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision makers".

3.4 The AoS (DEFRA, October 2010) examines the likely environmental, social and economic effects of the draft NPS and states that it is intended to consider and compare reasonable alternatives to them, identify any potential significant adverse effects they may have, and recommend options for avoiding or mitigating such effects. Page 36 of the AoS Technical Appraisal (Annex 3 Part 2) places this into the context of the ODPM's SEA process: "This AoS Report is the output from Stages B and C. This AoS Report is the output from Stages B and C. It is published alongside the draft NPS for a consultation period of 14 weeks. The consultation on the AoS and draft NPS, represents Stage D of the appraisal process." The assessment of reasonable alternatives is fundamental to the selection of the TTT route as it provides comparators for the environmental effects of the chosen solution. However, the AoS does not compare reasonable alternatives in the required manner or to the required degree.

Assessment of Alternatives

3.5 Paragraph 2.6.24 of the NPS describes the evolution of the TTT preferred option. It explains that the Thames Tideway Strategic Study was convened in early 2000 and reported in 2005 and comprised Department of the Environment, Transport and Regions (DETR), Thames Water, the Environment Agency, and the Greater London Authority, with Ofwat as an observer, and an independent chair. It produced a detailed investigation of the environmental impact of sewage overflows, identified objectives for improvement and proposed potential solutions. This was followed by an independent review for Ofwat published in February 2006, and further reports completed by Thames Water in the second half of 2006. Defra produced a 'Regulatory impact assessment – sewage collection and treatment for London' in March 2007 reviewing these various reports.

3.6 This process led to the selection of one of two tunnel based options by Thames Water in 2006, backed by Government in 2007 and reconfirmed in 2010 in the context of the NPS SEA. However, at no point was there any wider consultation on the selection of the preferred tunnel option. The preferred route for the tunnel was decided before the NPS was conceived and subjected to SEA consultation and the AoS. As such, neither the SEA consultation nor the AoS can have influenced the route selection in any meaningful way and there cannot have been an adequate assessment of reasonable alternatives.

3.7 Any consideration of alternatives in the context of the AoS would have required assessment against the same sustainability topics and objectives and guide questions contained in the AoS. This plainly was not done. Even if it had been done, any AoS assessment of alternatives would have relied on inadequate information, being the 2006 data. This data would already have been out of date at that time. These factors all adversely impact on the quality of subsequent consultations, which are inextricably bound up in the process of selecting development options.

Consultation Requirements

3.8 The judgment in Case C-474/10 *Department of the Environment for Northern Ireland v Seaport (NI) Ltd and Ors* highlights the importance of consultation in complying with the SEA Directive at paragraph 28, stating:

> *"The consultation procedure [thus] enshrines the right of every person to participate in decision-making procedures where they affect the environment.[...] The Aarhus Convention, it should be recalled, seeks to ensure that the public has a right to participate in decision-making procedures concerning the environment, particularly with regard to plans and programmes*

relating to the environment. However, consultation is not solely a right. It is also a duty, namely the duty to protect and improve the quality of the environment by expressing concerns and by assisting the authorities responsible for preparing plans to take due account of those concerns and by adopting the best decisions."

3.9 At paragraph 50 the European Court of Justice ("CJEU") held:

> *"art.6(2) of Directive 2001/42 must be interpreted as not requiring that the national legislation transposing the directive lay down precisely the periods within which the authorities designated and the public affected or likely to be affected for the purposes of* art.6(3) and (4) *should be able to express their opinions on a particular draft plan or programme and on the environmental report upon it. Consequently, art.6(2) does not preclude such periods from being laid down on a case-by-case basis by the authority which prepares the plan or programme. However, in that situation, art.6(2) requires that, for the purposes of consultation of those authorities and the public on a given draft plan or programme, the period actually laid down be sufficient to allow them an effective opportunity to express their opinions in good time on that draft plan or programme and on the environmental report upon it."*

3.10 Further, in the High Court (NI) in *Seaport* [2008] Env. L.R. 23 Weatherup J. held that the environmental report and the draft plan must be consulted upon at the same time (emphasis added):

> *"47 The scheme of the Directive and the Regulations clearly envisages the parallel development of the environmental report and the draft plan with the former impacting on the development of the latter throughout the periods before, during and after the public consultation. In the period before public consultation the developing environmental report will influence the developing plan and there will be engagement with the consultation body on the contents of the report. Where the latter becomes largely settled, even though as a draft plan, before the development of the former, then the fulfilment of the scheme of the Directive and the Regulations may be placed in jeopardy. The later public consultation on the environmental report and draft plan may not be capable of exerting the appropriate influence on the contents of the draft plan.*
>
> *48 Then there is the public consultation period. Article 4.1 continues to apply. Article 6.2 provides that consultees shall be given an early and effective opportunity within appropriate timeframes to express their opinion "on the draft plan or programme and the accompanying environmental report before the adoption of the plan." Regulation 12(1) refers to the draft plan and its "accompanying" environmental report as "the relevant documents". Regulation 12(2) provides that as soon as reasonably practical after their preparation the responsible authority shall send a copy of "the relevant documents" to the consultation body. Regulation 12(3) provides that the responsible authority shall publish a notice that includes inviting expressions of opinion on the relevant documents.*
>
> *49 Once again the environmental report and the draft plan operate together and the consultees consider each in the light of the other. This must occur at a stage that is sufficiently "early" to avoid in effect a settled outcome having been reached and to enable the responses to be capable of influencing the final form. Further this must also be "effective" in that it does in the event actually influence the final form. While the scheme of the Directive and the Regulations does not demand simultaneous publication of the draft plan and the environmental report it clearly contemplates the opportunity for concurrent consultation on both documents."*

3.11 This issue was not referred to the CJEU, so it must have been considered to be an issue which was *acte clair* i.e. the answer was obvious. The NI SEA Regulations are in substantially the same form as those applicable in England and Wales.

3.12 The time when consultation must be carried out was considered in *R v. Brent London Borough Council, ex parte Gunning* (1985) 84 LGR 168 at 169), which held that consultation must be carried out when proposals are still at formative stage. Case law suggests that a "formative stage" is one at which the decision maker has not closed its mind to the outcome of consultation. There was no consideration of whether any other, alternative routes could instead inform the NPS in such a way as to satisfy the SEA Directive criteria.

3.13 In *Heard v Broadland DC and Ors* [2012] EWHC 344, the Court found in favour of the Claimant who challenged a Joint Core Strategy ("JCS") on the grounds that the author councils did not adequately explain:

3.13.1 which reasonable alternatives were assessed; and

3.13.2 that not all alternatives were assessed to the same level (i.e. the quality of the assessments themselves were not at issue but rather the lack of explanation about them).

3.14 The Court accepted that the JCS had been the subject of frequent public consultation and the preferred option had been properly assessed. A number of alternatives had also been assessed. However, it was not easy to discern how the councils had answered the essential factual contention of the claimant, namely that the outline reasons for the selection of alternatives at any particular stage had not been given clearly. There had been SEA but no discussion of why the preferred option came to be chosen. Neither was there any analysis on a comparable basis, so far as required by the SEA Directive, of the preferred option and selected reasonable alternatives.

3.15 There is no express requirement in the SEA Directive that alternatives be appraised to the same level as the preferred option. However, the Court held that the aim of the SEA Directive is to ensure equal examination of reasonable alternatives alongside the preferred option. The SEA process should test whether the original preferred option continued to be the preferred option after a fair and public analysis of reasonable alternatives. This opportunity has not been afforded to those affected by the TTT route selection.

3.16 Further, *ex p Gunning* clarified that consultees should be made aware of the basis on which a proposal for consultation has been considered and will thereafter be considered and should be made aware of the decision-making criteria (*R (Capenhurst) v. Leicester City Council* [2004] EWHC 2124 (Admin) at [46], approved by the three-judge Divisional Court in *Robin Murray & Co. v. The Lord Chancellor* [2011] EWHC 1528 (Admin) at [37(4)]). This information was not made available to stakeholders at the time of the NPS and there has been no consultation on alternative routes (which might result in update of the NPS) since the NPS was designated. This impacts on all those affected by the scheme.

4 JR CHALLENGE TO THE NPS

4.1 Failure to remedy this point now means that any ultimate grant of the DCO for the TTT will be susceptible to legal challenge. The European law principles of certainty, effectiveness and sincere co-operation, together with section 104(4) of the Planning Act 2008, mean that a failure to meet SEA requirements at the outset of the consenting process (the NPS) results in subsequent decisions based on that flawed NPS – such as a the grant of the DCO - being subject to challenge.

4.2 The NPS must comply with EU law and, where they conflict, EU law prevails under Section 104(4) Planning Act 2008. UK Courts consider the principle of effectiveness of EU law to be one whose "importance cannot be overstated" (*Autologic Holdings plc v Inland Revenue Commissioners* [2004] EWCA Civ 690 [2004] 2 All ER 957 at [25] per Gibson LJ). The duty of sincere co-operation in good faith stemming from Article 4 of the Treaty on European Union was considered in (*R (Wells) v Secretary of State for Transport, Local Government and the Regions (C-201/02)*, where it was held that this duty of co-operation means that it may be necessary to revoke or suspend a consent to make way for the required environmental assessment.

4.3 Given these principles and duties, the public interest, rights of proper consultation under the SEA Directive and Aarhus Convention and the need to ensure that compliance with EU law is not subverted by way of time bars, there would be a robust basis for challenging the legality of a TTT DCO. To correct the SEA breach, DEFRA should re-consult on the NPS, showing proper assessment of reasonable alternatives including TTT route selection. This could be done in parallel with any re-consultation on other changes to the DCO application.

4.4 A possible alternative in the DCO application process may be to give no weight to the NPS on the basis that it is founded on an unlawful SEA breach.

Pinsent Masons LLP
20 September 2013

Appendix 2 London Borough of Southwark's Phase One consultation response

APPENDIX B

Southwark Council

Our Ref: Cllr PJ/H1198/jcm
11th January, 2010

Thames Tunnel Consultation
Thames Water Utilities
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Dear Sir / Madam,

THAMES TUNNEL CONSULTATION

Thank you for consulting London Borough of Southwark on the proposed routes and sites for the Thames Tunnel.

As a borough with around 4.5 miles of River Thames frontage, Southwark has a strong interest in reducing the amount of sewage which overflows into the river every year.

Notwithstanding this, Southwark objects very strongly to the use of open spaces at King's Stairs Gardens and Alfred Salter Playground (Druid Street) as sites for a reception shaft and CSO shaft respectively.

Site Selection methodology

The methodology Thames Water used to select the preferred sites is far from clear. The Site Suitability Report and the "How we chose the preferred site" document assess each of the Southwark sites from a planning, engineering, environmental, socio-economic and property perspective. However there is no attempt to use an appropriate weighting mechanism to compare shortlisted sites and evaluate impacts which in turn would inform a sequential approach to the selection of sites. The council considers that this undermines the selection process. Thames Water is urged to reconsider the selection of the preferred sites in the light of a systematic and transparent mechanism for assessing the impacts on all sites, informing a comparison of sites and the use of a sequential approach.

Size of sites required

The council notes that paragraph 3.1.3. of the King's Stair's Gardens Site Suitability Report states that schematic site layouts have not been optimised. Independent engineering advice received by the council suggests that that Thames Water's stated requirement for a site area of 7,500sqm for a reception shaft located in chalk conditions is very generous and that an area of between 2,500sqm and 5,000sqm should be sufficient. Thames Water is urged to reconsider the site areas required and ensure that this informs a review of the selection of the preferred sites.

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King's Stairs Gardens

In response to consultation on Thames Water's shortlist of sites carried out in December 2009, Southwark ranked sites in order of preference. King's Stairs Gardens was the least preferred site. It is with great disappointment therefore, that the council learned that King's Stairs Gardens has been selected as a preferred site. It does not consider King's Stairs Gardens an appropriate site for a reception shaft for the following reasons:

Open space

Open space has the highest level of protection in the London Plan. Its value to London is recognised in objective 1 of the London Plan which states that London's growth should be accommodated within its boundaries without encroaching on open spaces. Objective 6 makes it clear that the protection of green spaces is integral to London's status as a world city. Among the key policy directions for objective 6 are the imperative of developing brownfield sites rather than developing on green space, and the need to protect and enhance open spaces. Development of a greenfield site in preference to available brownfield sites would run contrary to these objectives.

King's Stairs Gardens is designated as metropolitan open land (MOL) in the Southwark Plan. As MOL, it is an open space of regional importance. London Plan policy 3D.10 states that MOL should be afforded similar protection to greenbelt. It indicates that there are a number of purposes for including land within MOL, including its contribution to the physical structure of London by being clearly distinguishable from the built up area. In addition to being a sizable space in its own right, in linking Southwark Park with the River Thames, King's Stairs Gardens plays a critical role in forming a much larger break in London's built development.

It is also a valuable amenity to local people. In preparing the draft core strategy, Southwark collected evidence on open space, in accordance with guidance in Planning Policy Guidance 17. This evidence demonstrated that while King's Stairs Gardens is not itself located in an area of open space deficiency, it is located close to areas in which there is a deficiency in open space. Between them the 5 wards which comprise the Borough and Bankside and Bermondsey community council areas have 1 park of local size (over 2ha) and no parks of district size (over 20ha). Against a Southwark-wide average of 0.62ha of local and district parks per 1000 population, Borough and Bankside has 0.18ha and Bermondsey has 0ha.

Policy 3D.11 in the London plan provides a benchmark for provision of open space. It categorises spaces according to their size and sets out a desirable distance which Londoners should travel in order to access each size of open space. Table 3.1 indicates that people should live within 1.2ha of a district park and 400m of a local park. Map 5.1 in Southwark Open Spaces Evidence Base, 2009, CDEN3 demonstrates there are few areas in the Borough and Bankside community council which have access to a district park within 1.2km. Similarly there are few areas in both community councils which have a local park located within 400m.

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The loss of much of King's Stairs Gardens over a seven year period and the construction of residual permanent structures would exacerbate an existing deficiency in access to local and district parks. This would be compounded by the loss of the existing play facilities.

The Mayor's SPG on Providing for Children and Young People's Play and Informal Recreation indicates that housing should generally have a doorstep playable space within 100m to provide play facilities for 0-5 year olds (see appendix A, B.5). While the play facilities in King's Stairs Gardens are accessible to many local families, they are particularly important for people living in the 24 dwellings in Cathay House (adjacent to King's Stairs Gardens) and the 76 dwellings on the Millpond Estate, West Lane (to the east of King's Stairs Gardens), for whom the playground provides the only play facilities within 100m of their homes. The loss of the play facilities would leave these homes without adequate play facilities, contrary to Southwark Plan policy 3.1, London Plan policies 3A.17 and 3D.13.

In the reasons for selecting King's Stairs Gardens, Thames Water point to the presence of Southwark Park immediately to the south of the site. However, in the council's view, the proximity of Southwark Park does not diminish the role which King's Stairs Gardens plays in providing a clear break in the urban fabric of this part of London and nor can it compensate for an existing deficiency in district and local parks.

There is a presumption against inappropriate development on MOL. Appropriate development is defined tightly as comprising agriculture or forestry, essential facilities for outdoor sport and recreation, cemeteries and other uses which do not conflict with the purpose of including land in MOL. Use of MOL for access to a tunnel construction sites and erection of permanent residual buildings would not comprise appropriate development and would be contrary to policy 3.25 in the Southwark Plan, draft Core Strategy policy 11 and policy 3D.10 in the London Plan. The fact that another open space, Southwark Park, is located close to King's Stair's Gardens should not comprise a reason for departing from MOL policy.

In its response to Thames Water's December 2009 consultation on the shortlisted sites, Southwark attached very significant weight to the fact that King's Stairs Gardens is designated MOL. The council does not consider that Thames Water has given sufficient weight to this designation in selecting its preferred site. Given the strength of London Plan objectives 1 and 6, as well as the MOL designation, Southwark's view remains that non-MOL sites which are available, should be regarded as sequentially preferable to King's Stair's Gardens.

Nature conservation

London Plan paragraph 3.318 states that one of the key objectives of the Mayor's Biodiversity Strategy is to ensure that all Londoners have ready access to wildlife and natural green spaces. Moreover, the plan states that this is particularly important where there is a shortage of green space and in Areas for Regeneration.

The evidence on biodiversity presented at the core strategy examination advised that combinations of habitats in King's Stairs Gardens are not commonly found in Southwark

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outside its parks and moreover that the site forms part of an unbroken green chain between Surrey Quays and the Thames (see Biodiversity and Sites of Importance for Nature Conservation, CDB9). Consequently, King's Stairs Gardens is proposed as a site of importance for nature conservation in Southwark's draft core strategy.

Whilst the King's Stairs Gardens site suitability report acknowledges its nature conservation and biodiversity value, there is no evidence of the weight attributed to this or the way in which impacts compare with those on other sites. This is a deficiency in the selection methodology, which, as in the case of open space, makes the sequential ranking of sites difficult to ascertain.

Map 3D.4 in the London Plan shows areas of deficiency in access to nature in London. Much of the Borough and Bankside community council area and a part of the Bermondsey community council area are shown in the area of deficiency. Even if it were possible to mitigate the potential harm of proposals in the long term, once the park had been restored, the loss of King's Stairs Gardens over a 7 year period would exacerbate this deficiency in access to nature and compound problems associated with a shortage of open space, contrary to the expectation of policy 3D.14 in the London Plan.

In addition, while the proposal to transport excavated material away from the site by barge is welcomed, the construction of a new jetty may have biodiversity impacts on the Thames and river bed which have not yet been fully considered.

Thames policy area

King's Stairs Gardens is located in the Thames Policy Area (TPA) as designated in the Southwark Plan. This responds to policies 4.16 and 4.17 of the London Plan which state that boroughs should recognise that the Thames plays an essential role in maintaining London as an exemplary, sustainable world city.

King's Stairs Gardens comprises one of few open spaces which have a river frontage in Southwark, and plays an important part in enabling Southwark residents to enjoy the river and its environs. In accommodating the Thames Path, it also provides a valuable amenity for residents and visitors, which encourages enjoyment of the river and helps connect Southwark's designated strategic cultural areas in Borough, Bankside and London Bridge to the west, with St Mary's conservation area to the east.

It is noted that the consideration of socio-economic and community impacts in the King's Stairs Gardens Site Suitability Report concludes that:

> "This site is unsuitable as an intermediate shaft site with CSO connection as, in addition to the impacts associated with an intermediate shaft site, works would involve a large jetty protruding into the river, disrupting views from the Angel public house and riverside residences in the area. The overflow culvert that would remain after the works is also likely to affect the user's experience of the park in future.

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The proportion of the park likely to be lost for any of the three types of sites is a significant issue, especially the loss of the new children's play area. This loss of open space can, in part, be mitigated for, due to the availability of alternative open space in the vicinity in the form of Southwark Park. However, the character of King's Stairs Gardens as a river-facing public open space may be difficult to replicate" (p. 17, paragraphs 10.5.4 and 10.5.5).

The loss of the park over a 7 year period would be detrimental to the enjoyment of the river Thames, while the residual structures in the park are likely to be harmful to its character and appearance. In view of this, the proposal is not consistent with Policy 3.29 of the Southwark Plan, draft Core Strategy policy 12 or London Plan policy 4C.6 which seek to ensure that character of the TPA is protected and enhanced.

Archeological priority zone

It should be noted that King's Stairs Gardens is located within an archeological priority zone. Archeology, and in particular the site of the Manor House of Edward III which is a scheduled monument (the highest historic designation – more significant that a grade I listed building) has a historic connection with the river is a visible feature in the area and plays a significant role in shaping the character of the area.

This scheduled monument is visible from the public realm particularly from the Thames footway. The setting of the scheduled monument and its connection to the river are part of its historical significance. Inappropriate development in this area is likely to have a harmful impact on the setting of this site of national importance. Failure to demonstrate adequate mitigation of impacts would be contrary to Southwark Plan policy 3.19 and London Plan policy 4B.15.

Listed and locally listed buildings

There are two listed buildings in the proximity of King's Stairs Gardens: the Angel public house which is grade II listed and the grade II listed Sir William Gaitskell House. Both are listed due to their architectural or historic significance, the former is a public house dated at 1830, possibly incorporating parts of an earlier 17th century public house of the same name. The latter is a house dated at 1814 which was a police station from 1838 and most recently used as offices. The listing description extends to the building's railings, handrails and a historic lampholder and includes a detailed description of the interior most of which survives.

The Site Suitability Report acknowledges that the proposed jetty would disrupt views from the Angel Public House (paragraph 10.5.4). In addition, the council considers that the permanent structures proposed are likely to be detrimental to the setting of these two listed buildings particularly the public house which is viewed from the river and the Thames path and is sensitive to large engineered structures nearby.

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The St Peter's and the Guardian Angels RC Church on Paradise Street, adjacent to King's Stairs Gardens is included on the council's draft local list as a building of architectural and historic significance. This church is a positive contributor to conservation value of the area, is a local landmark and is visible from King's Stairs Gardens across the way on Paradise Street.

Proposals which harm the setting of the listed buildings and or locally listed buildings would be contrary to Southwark Plan policies 3.15 and 3.18, and London Plan policy 4B.12.

Heritage

King's Stairs Gardens also plays a key role in preserving the setting on the scheduled monument at the site of Edward III's Manor House, as well as the setting and views to and from Southwark Park, which is a grade II registered historic park. These settings are also greatly improved by the trees in the park. A recent tree survey undertaken by the council demonstrates that many of the trees in the park are of good quality. They contribute to the character and appearance of the park, particularly in its role of providing views into and out of Southwark Park and providing an open and attractive link between Southwark Park and the river.

The council consider that there is considerable merit in the proposal to designate King's Stairs Gardens and Edward III's Manor House as a conservation area. The designation would recognise the park's key role in preserving the setting on the scheduled monument at the site of Edward III's Manor House and the setting and views to and from Southwark Park, which is a grade II registered historic park. The council will shortly commence public consultation on this proposal.

The Site Suitability Report recognises the impact which the proposed use of the site would have:

> "Removal of mature vegetation and the presence and operation of machinery, materials stores and buildings on site is likely to severely impact character of the park and river frontage. This site is, therefore, not suitable.... Permanent elements would potentially result in permanent, adverse direct impacts on the character of the park, the River and its frontage" (appendix 9, pp. 17-18).

Use of the park as a construction site, loss of trees within the construction site and the erection of permanent residual structures would harm the heritage and conservation value of the area contrary to Southwark Plan policy 3.15, 3.18 and draft Core Strategy policy 12.

For the reasons set out above, Southwark object very strongly to the use of King's Stairs Gardens as a proposed shaft site. Use of King's Stairs Gardens would harm many interests of acknowledged importance, including MOL, nature conservation and heritage. In the light of this, the council urge Thames Water to consider the use of alternative sites and routes which avoid the use of King's Stairs Gardens.

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Alfred Salter Playground, St John's Estate, Druid Street

The loss of the playground, albeit over a temporary period, would result in the loss of an

important residential amenity in an area with limited access to open spaces. The council's open spaces evidence base demonstrates that this site lies in an area which is deficient in local and district parks (refer to Map 5.1 in Southwark Open Spaces Evidence Base, 2009, CDEN3).

As is noted above, the Mayor's SPG on play facilities indicates that housing should generally have a doorstep playable space within 100m to provide play facilities for 0-5 year olds. Other than the very small second play area on the St John's estate which has very limited facilities, there are no other play spaces within 100m of the estate.

The Mayor's SPG also advises that 300m is a reasonable benchmark for accessibility to play spaces for 0-11 year olds (local playable space). The nearest local playable spaces to the estate are on the Arnold Estate which is around 400m away.

The loss of the play facilities would leave the 79 homes on the St John's Estate without adequate play facilities, contrary to Southwark Plan policy 3.1, London Plan policies 3A.17 and 3D.13.

Thames Water's Site Suitability Report notes that the site formerly accommodated a cooperage, built upon a burial ground. This is the site of Butler's Burial Ground, one of a number of commercial burial operations which sprang up around London in the later years of the 18th century and which were closed by the Burial Act of 1852.

The presence of a post-medieval cemetery in this area would require a significant programme of archaeological excavation and recording prior to the commencement of any construction works. English Heritage and the Advisory Panel on the Archaeology of Burials in England are presently drawing up guidelines for the excavation of post-medieval cemeteries. Failure to demonstrate adequate mitigation of impacts would be contrary to Southwark Plan policy 3.19 and London Plan policy 4B.15.

For the reasons set out above, Southwark object strongly to the use of Alfred Salter Playground as a CSO shaft site and urge Thames Water to review sites along the alignment of the CSO, including sites on its original long-list, to find an acceptable solution.

All sites

The construction of the tunnel is likely to have significant social, economic and environmental impacts. Thames Water have indicated that planning proposals will be subject to environmental impact assessment (EIA). Southwark wishes to be consulted on the scoping of EIAs. In addition to the impacts set out in the analysis above, the EIAs will be expected to cover a broad spectrum of issues including: traffic and transport, odour, air quality (all sites are located in a designated Air Quality Management Area), noise, the local economy, jobs and local educational and community facilities.

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All shortlisted sites are located within an air quality management area. Thames Water will be expected to demonstrate that proposals do not result in a reduction in air quality, through an air quality assessment, as set out in Southwark plan policy 3.8. Construction of shafts and the residual ventilation structures will also have noise and odour impacts.

In this context, the council notes with great concern the statement in the Site Suitability report that:

> "This site is considered less suitable for use as an intermediate, intermediate with CSO or main shaft site, due to the proximity of residential receptors to the west, south and east. Any shielding afforded by the site perimeter barriers would be largely ineffectual due to the height of these receptors. Twenty-four hour working has particular potential to adversely impact upon the closest receptors, and it may be necessary to restrict some of the noisier activities to daytime only. Access of HGVs to the site is also likely to result in disturbance, as they approach through residential streets.
>
> For a main shaft and the intermediate with CSO, the importing and exporting of material by barge would also result in an adverse impact on residential receptors located near to the barge jetties" (p. 11, paragraphs 7.9.1-7.9.2).

Proposals which do not demonstrate that they can mitigate these impacts satisfactorily would be considered unacceptable by Southwark, in line with Southwark Plan policies 3.1 and 3.2.

With regard to transport, while Thames Water have committed to transporting excavated materials by barge where possible, in the case of a number of sites, such as the Alfred Salter Playground, this is not feasible. All proposals will be expected to be accompanied by a transport assessment, which demonstrates that transport and traffic impacts have been addressed.

Sustainability Appraisal

Whilst any future applications affecting Southwark sites would be subject to an environmental impact assessment, it should be noted that an EIA tests the environmental impacts of a particular development. In 2005, the Thames Water Tideway Strategic Study indentified a number of strategic options for addressing the environmental problems of CSOs and concluded that the Thames Tideway Tunnel was the preferred option. Whilst this study included a regulatory impact assessment, it is not clear whether the identified options were subjected to any sustainability or environmental appraisal before selecting the Thames Tideway Tunnel or the preferred route.

The government has recently commenced consultation in respect of the draft National Policy Statement for Waste Water which addresses the need for nationally significant infrastructure projects and includes the Thames Tideway Tunnel. Whilst the draft NPS is the subject of a separate consultation response, it is noted that it relies on the 2005 study and

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states that Thames Tunnel is the preferred infrastructure solution and that the sustainability appraisal will be include "an assessment of the specific aspects" of the Thames Tunnel proposal. In the council's view, this suggests that options should have been subject to sustainability appraisal at the time the 2005 study was conducted.

We urge Thames Water to reconsider the use of King's Stairs Gardens and Alfred Salter Playground and trust that these comments will be taken into account when making a final decision on sites and the route.

Yours faithfully,

COUNCILLOR PETER JOHN
LEADER OF THE COUNCIL

Appendix 3 London Borough of Southwark's Phase Two consultation response

Southwark Council

8th February, 2012

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Dear Sir / Madam,

THAMES TUNNEL: PHASE TWO PUBLIC CONSULTATION

Thank you for consulting London Borough of Southwark on the preferred route and sites for the Thames Tunnel.

Southwark reiterates that it recognises the importance of reducing the amount of sewage that reaches the Thames and supports the efforts to clean up the river to meet the requirements of the EU wastewater directive.

Notwithstanding this, Southwark has significant concerns over the current proposal. Thames Water has not demonstrated that the tunnel proposal is the most appropriate environmental option or cost effective means of meeting the requirements of the EU wastewater directive and objects on those grounds. Southwark also strongly objects to the use of Chambers Wharf as a shaft construction site and has outstanding concerns about the works proposed at the Shad Thames Pumping Station and Earl Pumping Station.

1. Principle of the Tunnel

On 4 July 2011, Southwark, joined four other London boroughs (Hammersmith and Fulham, Kensington and Chelsea, Richmond and Tower Hamlets) to sponsor an independent commission led by Lord Selborne to review the proposed Thames Tunnel (the Commission). The report of the Commission published in October 2011 strongly recommends that the Ministerial request to Thames Water to pursue a full-length tunnel be reconsidered to enable proper evaluation and equal consideration to be given to the full range of 'best technical knowledge' options available to manage storm water.

The Commission encouraged DEFRA to recommend to the EU that there is a need for an environmental and economic reassessment to ensure not only that storm water overflow issues are addressed but also that flooding and wider societal benefits are considered and that the options pursued do not entail excessive cost for the benefits accrued in today's economic climate.

The Commission found that the alternative options to a full length tunnel have never been adequately tested, especially where such alternatives can deliver more than the mono-benefit of Combined Sewer Overflow spill reduction that the tunnel will provide. These options include reducing flows by separation, by green infrastructure, by the construction of local detached sewage treatment works, by the construction of distributed storage and by the enhancement of the existing sewerage network, thereby allowing a partial tunnel solution at a lower cost or even a non-tunnel solution.

On the basis of the Commission's findings, Southwark will continue to dispute the need for the tunnel until there has been an environmental and economic reassessment of the proposal. Furthermore, in the light of the findings, Southwark disputes the full-length storage tunnel option as the best possible means of meeting the requirements of the Urban Waste Water Treatment Directive and considers that other technical options, which remain unexplored, may be as viable and more cost-effective.

As set out in the findings of the Commission, Southwark wishes to raise serious concerns about the escalating costs of the Thames Tunnel and the impact this will have on customers, pushing a significant proportion of Thames Water bill payers into water poverty.

Alongside the reservations expressed above relating to the need for the Tunnel, Southwark objects to the use of both Chambers Wharf and Shad Thames Pumping Station as part of the proposal.

2. Chambers Wharf

It is proposed that Chambers Wharf is used as a main tunnel drive site as an alternative to King's Stairs Gardens. Chambers Wharf is a cleared re-development site that has planning permission for residential development.

It is noted that, unlike King's Stairs Gardens, Chambers Wharf is a brownfield site. The site also has access to the River Thames, which would allow the removal of excavated material and delivery of construction materials to the site via barge. Notwithstanding this, Southwark objects to the use of Chambers Wharf as a main tunnel drive shaft for the reasons set out below.

The impacts to be considered in relation to Chambers Wharf are twofold. The relationship of the proposal and the impact on both existing residential properties and future occupiers of the consented residential scheme at Chambers Wharf must be fully assessed.

The consented residential scheme at Chambers Wharf (ref. 07-AP-1262) and the impact on future occupiers is a significant consideration. Firstly, whilst the council recognises the need for efficient use of land, Thames Water must fully explore whether the proposed Tunnel and consented residential scheme are able to co-exist on the same site without adverse impacts on future residential occupiers. The scheme is likely to be implemented in the near future. The council understands St James does not propose to build out the private housing situated to the north of the site, until after the Tunnel is constructed. By virtue of a Section 106 agreement dated 8 October 2010, some 198 affordable housing units to the south of the site would be delivered before the private units. We understand that implementation of this scheme and therefore construction of the affordable housing units is likely to occur before or concurrently with the Thames Tunnel proposal. The adverse impacts of the Thames Tunnel proposal on the future occupiers of the consented scheme must be fully assessed both during construction and operation phases.

Noise and vibration

The site is located in close proximity to several existing residential properties surrounding the site including existing residential properties on Loftie Street adjacent to the east boundary of the site. The rear gardens and rear windows of several of these properties would directly face the site and would be in close proximity to key elements of the works including the underground shaft. There are also existing flats adjacent to the west boundary of the site.

The Preliminary Environmental Information Report (PEIR) states that the current noise climate is dominated by road traffic noise. This does not create an accurate impression of the existing noise environment around the site. Whilst traffic noise is audible in the vicinity of the site, it is not particularly notable, and properties around the site enjoy a generally peaceful noise climate relative to their central London location.

In its assessment on noise, the PEIR itself concludes that *"significant noise effects arising from construction activities are predicted at residential properties at Luna House, Axis Court, Chambers Street, Chambers Wharf South (proposed development), Bevington Street, Bermondsey Wall East and Fountain Square"* (PIER Non-technical Summary, Chambers Wharf, page 258). The PEIR goes onto state that *"it is anticipated that additional mitigation would be required to address significant noise effects. These could include the increased hoarding heights, use of localised screens and enclosures to reduce noise from particularly noisy, static operations"* (PIER Non-technical Summary, Chambers Wharf, page 258).

The impact of the proposals upon local residents is a particular concern given that the construction programme is expected to last for approximately six years. It is also relevant that following the construction phase of the Thames Tunnel there will be a further period of construction for the residential development, resulting in an even more prolonged period of disturbance for residents.

Given the close proximity and intimate relationship between the residential properties (including that new development proposed on Chambers Street) and the site, there is a strong likelihood of serious harm resulting from noise and disturbance upon the living conditions of the residential properties in the vicinity of the site. There are currently no detailed proposals in place which demonstrate how the harm will be mitigated and objection is therefore raised to the proposals on this basis.

Given the relationship of the construction proposals with residential properties (including the consented residential scheme on the site) extensive mitigation would be required to counter the serious noise and disturbance likely to occur, if the scheme were to go ahead. Such mitigation needs to be carefully considered well in advance of the application. They would also need to be rigorously monitored. Consideration should be given to enclosure of the head of the shaft and the main lifting and loading operations on the site. In paragraph 9.2.3 of the PIER Main Report, Volume 22: Chambers Wharf Site Assessment, it is stated in the assessment that the hoarding height will be 2.4m at this site. However in the Control of Construction Practice Part B document the height of the hoarding is stated to be 3.6m. In considering mitigation it needs to be borne in mind that the use of high hoardings and screening panels could also have adverse impacts upon both the general visual amenity of the area, key viewpoints and could appear oppressive when viewed from adjacent residential properties. Alternative noise mitigation measures such as secondary glazing should also be considered, if the proposal were to go ahead.

It should be demonstrated that the noise levels resulting from the operation of the ventilation system will not increase the current background noise levels as per "LBS Sustainable and Construction SPD".

The impact upon the living conditions of residents would be exacerbated by additional disturbance from vehicle movements to and from the site. During construction, vehicles would access and egress the site onto Chambers Street, connecting to Jamaica Street via Bevington Street. The proposed vehicular access to the site is proposed directly opposite the proposed flats on the south side of Chambers Street, increasing the likelihood of significant disturbance for future occupiers, the windows for some of whom will be immediately adjacent (albeit at a higher level) to the edge of the pavement.

For the first two years of the construction phase, average lorry movements will frequently be between 60 and 90 lorry movements per day. In the final four years of the construction phase the maximum number of lorry movements is expected to drop to drop to a maximum of 54 movements per day (for the avoidance of doubt each movement represent a trip to or from the site so the number of two way trips will be half this number). The number of overall lorry movements will drop significantly in the final year of construction. These figures are based upon an assumption that 90% of fill and excavated material movements would be transported by barge. If this 90% figure is not reached the number of lorry movements could potentially significantly increase. It is noted with concern that Thames Water indicates that the actual amount of waste transported by barge will be at the discretion of the package contractors and there is no formal commitment to achieving this target at Chambers Wharf.

There are also likely to be adverse implications, both in terms of disturbance and safety issues for the existing primary school located on Bevington Street in close proximity to the site. The council do not accept the method by which the schools are assessed against the ambient noise as indicated by the London noise maps. Instead, the criteria should be based on the baseline noise data.

Future proposals will need to clearly demonstrate how the works can operate without detriment to the operation, safety of children and learning conditions at the school. As well as the issues relating to construction of the scheme, further assessment is needed to ensure there would be no detrimental impact upon the existing and future local residents once the scheme is operational.

The proposal is contrary Policy 3.2 of the Southwark Plan which seeks to ensure that development does not result in a loss of amenity, including disturbance from noise, to present of future occupiers in the surrounding area or on the application site.

Design and visual impact

The proposed works will result in the need for amendments to the permitted scheme for residential development at Chambers Wharf to the north of Chambers Street. The detailed proposals of permanent works for the Thames Tunnel project will therefore need to be transposed onto the permitted scheme for the Chambers Wharf residential development and the council's agreement of the revised proposals will be required. The council has reservations that the proposal would be acceptable within the limitations of the existing residential scheme and Thames Water should work closely with the council to resolve this issue. Permission will need to be in place in place for any amended scheme prior to the commencement of the proposed tunnelling works.

The hoardings to be maintained during the construction period will affect views upstream and in particular significant views of Tower Bridge to the west from the public footway. The design and finish of the proposed hoardings should be given careful consideration, their presentation and maintenance for the 6 year duration of the construction should be considered and agreed with the council prior to the submission of the application. Careful consideration should also be given to the design of the hoarding to the river's edge and utilising an open fence to the extended pier to retain the up-stream views.

The 'Dolphin' is an historic river structure located immediately to the east of the wharf for the duration of the works. Careful consideration should this given the proposed use of barges to service the site and the works that will be required to the shoreline of the River. The proposals must ensure that the 'Dolphin' is properly safeguarded and protected during the construction programme.

The council would require a detailed condition survey be carried out of all heritage assets and residential properties that could be affected by the tunnelling works. The detailed condition survey should be retained for the duration of the works.

Should the scheme go ahead and without prejudice to its case, the council would support the removal of the projecting wharf and the reinstatement of the river edge. The design of the proposed vents is sensitive. These will be very prominent on the river walk and will become significant landmarks in the area. Their design should be developed more along the lines of sculptures than utilitarian vents and the council would prefer natural materials and a signature piece in this location.

The location, arrangement, scale, height and detailed design of the two kiosks remains to be agreed. The council would expect to be involved in detailed discussions about the design of these structures

The impact of the proposed un-filtered ventilation 'slot' needs further consideration – the council is very concerned over the workings of this feature of the re-constructed Thames Wall.

The 'Dolphin' should be carefully restored in accordance with a schedule of works that should be agreed with the council.

The council will need to be satisfied that the proposal is consistent with Policy 3.12 and 3.13 of the Southwark Plan and Core Strategy strategic policy 12 which seek to ensure that development achieve a high quality of both architectural and urban design, enhancing the quality of the built environment.

Thames policy area

Chambers Wharf is located in the Thames Policy Area (TPA). The purpose of the Thames Policy Area is to recognise the role of the Thames in maintaining London as an exemplary, sustainable world city.

Chambers Wharf comprises one of few development opportunities with a river frontage in Southwark and plays an important part in enabling Southwark to attract investment and meet the housing need of the borough. The site has planning permission and were it not for the tunnel proposal would be available for development. If the tunnel proposal goes ahead, the part of the site which fronts the Thames will not become available for development until 2022/23, blighting the regeneration of this part of the borough.

In view of this, the proposal is not consistent with Policy 3.29 of the Southwark Plan, Core Strategy policy 12 or London Plan policy 4C.6 which seek to ensure that character of the TPA is protected and enhanced. .

Heritage

The use of Chambers Wharf as a construction site is likely to be detrimental impact on the setting of the listed and locally listed buildings/structures close to the site. Riverside School and Bermondsey Wall West are both grade II listed and their settings would be compromised by the proposal. The proposals will also impact on nearby locally listed buildings such as 23 Jacob Street, the Dockhead Fire Station and The Ship Aground public house on Wolseley Street. Thames Water will need to demonstrate that these impacts are appropriately identified and mitigated against.

Chambers Wharf is adjacent to St Saviour's Dock conservation area and the recently designated, King Edward III Rotherhithe Conservation Area. The proposal is likely to significantly impact on the setting of the recently designated conservation area, which will be severely affected by the works which will block out most up-stream views along the river walk for the 6 year duration of the works.

Use of the site as a construction site would harm the heritage and conservation value of the area contrary to Southwark Plan policies 3.15 and 3.18 and Core Strategy policy 12.

Archaeological priority zone

The proposals for the excavation of the shaft will require an archaeological response. Archaeological works to the immediate south of Chambers Street, the southern part of the Chamber's Wharf site revealed remains relating to the post medieval shipping industry in this area together with a significant geoarchaeological potential. At St Michael's School, to the south of the site Roman settlement evidence and geoarchaeological evidence of the former watery landscape of the area was recorded. East of the site at Cherry Gardens Roman cremation burials have been identified. The judicious examination of borehole data should help with predictive modelling and the design of a suitable archaeological strategy.

The proposals also include the removal of the present jetty. Archaeological recording of the foreshore at Chamber's Wharf has revealed significant archaeological remains of various periods of foreshore archaeology. Proposals for work in this area will be required to record archaeological remains to be impacted by the removal of the jetty and new construction work for the replacement river wall. The removal of the jetty is also likely to increase the impact of tidal erosion on the foreshore so proposals for the recording of the archaeology should consider operational as well as constructional impacts upon this resource. The Thames Discovery Programme has been undertaking survey work on this foreshore as part of their wider project so a significant, recent baseline of archaeological data should be available.

It should be noted that Chambers Wharf is located within an archaeological priority zone. Southwark would expect any planning application to be accompanied by an archaeological assessment, evaluation of the impact of development and mitigation measures. Failure to demonstrate adequate mitigation of impacts would be contrary to Southwark Plan policy 3.19 and London Plan policy 7.8.

Open space

Chambers Wharf is close to Cherry Gardens which is an open space protected as Borough Open Land. It is an open space of borough importance and has the second highest level of policy protection afforded to greenfield sites. Any development on Chambers Wharf will need to demonstrate that there are no negative impacts on the nearby open space and its quality and value to the community for recreation and leisure purposes in line with Southwark Plan policy 3.26 and Core Strategy strategic policy 11.

Nature conservation

The River Thames is the borough's largest Site of Importance for Nature conservation and the site itself may have some habitats or species of value for nature conservation. Any development on Chambers Wharf will need to demonstrate that there are no negative impacts on the ecological value of the River Thames or the site itself in line with Southwark Plan policy 3.28 and Core Strategy strategic policy 11.

Transport and movement

The council is concerned about the high number of goods vehicles assumed to use the road network and the effect these will have on residential amenity, pedestrian and cyclist safety and road capacity generally, both locally and in relation to the cumulative impact of construction traffic on strategic roads. In order to minimise this, every effort should be made to transport fill, excavated material and construction elements by river. The council would expect this objective to override any commercial considerations.

Notwithstanding the above, it is recognised that there will be a requirement for goods vehicle movements. This raises concerns, as identified in the PEIR, on the safety of pedestrians and cyclists. Paragraphs 12.7.3 and 12.7.4 refer to diversion of pedestrian and cycling routes, but with no indication of the roads to which these can be diverted. Travel to and from the schools is obviously the key concern here, and the extent to which routes can be diverted will be limited by their fixed locations.

As is noted above, the lack of a formal commitment on the part of Thames Water to achieving the 90% target for transportation of waste by barge is a serious cause for objection. For this undertaking to be given any weight, it will need to be the subject of a condition of planning obligation as appropriate. Without such a commitment, it is possible that the number of lorry movements could rise substantially. Southwark considers that a binding commitment will be an essential part of the mitigation of the impacts of the proposals.

The relocation of parking should be assessed in the light of parking occupancy surveys, but it will be necessary to ensure that all current parking needs are accommodated. On the basis that no parking will be provided for workers on site and given that parking permits will not be available for workers within the controlled parking zone, overspill parking or the impact of workers' vehicles on the road network is not a concern. However, the council would wish to be assured that secure cycle parking will be provided on site.

For travel on the road network, the council considers the A200 for access to the A2 to be more appropriate than the A2208, since the A200 is part of the Strategic Road Network and that these are more appropriate than routes to the north/west, for reasons of road safety and traffic congestion.

Unless it can be demonstrated that the impacts of the proposal can be satisfactorily mitigated, the proposal will be contrary policies 5.1, 5.2 and 5.3 of the Southwark Plan, Core Strategy strategic policy 2 and London Plan policies 6.3, .68, 6.9 and 6.10.

Construction

The construction machinery and plant should be stipulated to meet the following criteria:

All contractors' vehicles cars and vans must meet or exceed the following CO_2 limits and European emission standards (euro standards) at the commencement of the contract:

- *Cars - maximum certified CO_2 emissions of 100 g/km and a minimum of Euro V emission standards*
- *Vans equal to or less than 1205 kg kerb weight – maximum certified CO_2 emissions of 110 g/km CO_2 and a minimum of Euro V emission standards*
- *Vans between 1205 and 1660 kg kerb weight – maximum certified CO_2 emissions of 150 g/km CO_2 and a minimum of Euro V emission standards*
- Vans greater than 1660 kg kerb weight – maximum certified CO_2 emissions of 210 g/km CO_2 and a minimum of Euro V emission standards

All contractors' heavy duty road vehicles and non-road diesel engines must meet or exceed the following emission standards at the commencement of the contract:

- Heavy duty road vehicles >3500 kg kerb weight – Euro 6 European emission standards
- Non road diesel engines between 19 and 36 kW – Stage 3A European emission standards
- Non road diesel engines between 37 and 55 kW – Stage 3B European emission standards
- Non road diesel engines between 56 and 560 kW – Stage 3B European emission standards

Air quality

There are no plots of the air quality assessments shown in the documentation in the PIER Main Report, Volume 22 Chambers Wharf Site Assessment.

Contamination

There are also no tables showing the results of the chemicals tests on the soils from the boreholes.

3. Shad Thames Pumping Station

Thames Water has now established that there is no longer a need to connect the Shad Thames Pumping Station CSO to the main tunnel. Instead it is proposed that storm flows are managed by utilising existing storage in the sewers upstream of the pumping station and implementing works at Shad Thames Pumping Station to inhibit it from pumping flows from the CSO into the River Thames.

Southwark has concerns about the proposed works on this site for the reasons set out below.

Noise and vibration

Given the proximity of the proposals to existing residential properties, including those immediately adjacent to the site, there is serious concern that the construction works (including excavation activity) and relating vehicular traffic will result in significant harm to the living conditions of neighbouring residents. Very careful consideration must therefore be given to the mitigation which can be provided, well in advance of the submission of the application. The council will also need to be satisfied that the operation of the revised pumping station would not result in additional noise or disturbance for residents, including noise from the proposed three storey extension to the rear housing electrical equipment. Consideration should also be given to the impact of the three storey rear extension upon the outlook and privacy of neighbouring residential properties.

As well as the issues relating to construction of the scheme, further assessment is needed to ensure there would be no detrimental impact upon the existing local residents once the scheme is operational.

The council will need to be satisfied that the proposal is consistent with policy 3.2 of the Southwark Plan which seeks to ensure that development does not result in a loss of amenity, including disturbance from noise, to present of future occupiers in the surrounding area or on the application site.

Design and Visual Appearance

This site is located within the St Saviour's Dock Conservation Area. Without prejudice to the council's objection to the proposal, further discussion should take place in connection with the demolition of an existing section of the pumping station building and the acceptability of the design of the three storey extension along with other alterations to the building including the new vehicular access doors on the front elevation.

The council will need to be satisfied that the proposal is consistent with Policy 3.12 and 3.13 of the Southwark Plan and Core Strategy strategic policy 12 which seek to ensure that development achieve a high quality of both architectural and urban design, enhancing the quality of the built environment.

Heritage

The use of Shad Thames Pumping Station as a construction site may have a detrimental impact on the setting of the listed and locally listed buildings close to the site, in particular 29 Shad Thames and Anise warehouse which are both grade II listed. Any proposals for development which impact on heritage assets should seek to enhance or preserve the heritage assets or their setting. Unless satisfactory mitigation is identified, use of the site for construction purposes would harm the heritage and conservation value of the area contrary to Southwark Plan policies 3.15 and 3.18 and Core Strategy policy 12.

Archaeological priority zone

Further information is required concerning the impacts upon the archaeological resource at this site. The drawings provided only show elevations and the area of the building to be replaced. It is understood that new pumps are to be inserted at this site. The Shad Thames area has a considerable post-medieval archaeological resource,

however, most significantly, remains from Bronze-age field systems survive, deeply buried on site. These are among some of the most significant archaeological remains of the development of agriculture in the UK. Further detail is required to determine the impacts upon this resource, which survives at approximately 4m below ground level. Proposals for this site will need to design in suitable access for archaeologists to excavate and record the archaeological resource.

It should be noted that Shad Thames pumping station is located within an archaeological priority zone. Southwark would expect any planning application to be accompanied by an archaeological assessment, evaluation of the impact of development and mitigation measures. Failure to demonstrate adequate mitigation of impacts would be contrary to Southwark Plan policy 3.19 and London Plan policy 7.8.

Transport

The council is concerned about the high number of goods vehicles assumed to use the road network and the effect these will have on residential amenity, pedestrian and cyclist safety and road capacity generally, both locally and in relation to the cumulative impact of construction traffic on strategic roads. Thames Water will need to provide details of the number of vehicle movements expected as part of a transport assessment.

Notwithstanding the above, it is recognised that there will be a requirement for goods vehicle movements. This raises concerns on the safety of pedestrians and cyclists.

The relocation of parking should be assessed in the light of parking occupancy surveys, but it will be necessary to ensure that all current parking needs are accommodated. On the basis that no parking will be provided for workers on site and given that parking permits will not be available for workers within the controlled parking zone, overspill parking or the impact of workers' vehicles on the road network is not a concern. However, the council would wish to be assured that secure cycle parking will be provided on site.

The proposal will need to demonstrate compliance with policies 5.1, 5.2 and 5.3 of the Southwark plan, Core Strategy strategic policy 2 and London Plan policies, 6.3, .68, 6.9 and 6.10.

Environmental impacts

The detailed plan 110-DX-ARC-SM04X-000465 & 110-DX-ARC-SM04X-000467 show the termination of the ventilation pipe at the eaves level. This could result in a loss of amenity due to downwash of any odour due to design of the building. There is only a site information paper for this site. It is recommended that there should be a separate volume of preliminary environmental information report in a similar manner to the "Design Development Report – Appendix Y – Other works".

4. King's Stairs Gardens

Whilst the preferred site put forward is Chambers Wharf, it is noted that Kings Stairs Gardens remains a possible alternative site and is therefore still included in the phase two public consultation.

For all of the reasons set out in the council's previous response (appendix A), including the loss of open space and as well as negative impacts on local heritage assets and value for nature conservation, Southwark continue to object strongly to the

possible use of King's Stairs Gardens as a main shaft site. Use of King's Stairs Gardens would harm many interests of acknowledged importance, including MOL, nature conservation and heritage.

The previous objections raised to the use of this site are carried forward as part of the council's response to the current consultation.

5. Druid Street

Whilst the preferred site put forward is Shad Thames Pumping station, it is noted that the site at Druid Street remains a possible alternative site and is therefore still included in the phase two public consultation.

For all of the reasons set out in the council's previous response (appendix A), including the impact on the amenity of surrounding residential properties as well as the temporary loss of an important children's play facility, Southwark continue to object to the possible use of Druid Street as a CSO construction site.

The previous objections raised to the use of this site are carried forward as part of the council's response to the current consultation

6. Earl Pumping Station

Although located within the London Borough of Lewisham, Earl Pumping Station adjoins the boundary with Southwark. There is a significant risk of impacts upon the residential properties in Southwark given their location facing the north west and south west boundaries of the site.

The PEIR identifies that there will be significant noise effects arising from construction activities for properties located with Southwark, including those properties on Chilton Grove immediately adjacent to the north west and south west boundaries of the site. Significant vibration impacts are also predicted from the construction works. No acceptable details are currently provided of how such impacts upon Southwark residents will be successfully mitigated and objection is therefore raised given the adverse impacts that would be likely to result for the adjacent residents.

It is acknowledged that all materials being imported to or exported from the site must travel by road. The council considers that vehicle routes to and from the south via the A200 are more appropriate than the A2208, since the A200 is part of the Strategic Road Network, or to the north/west for reasons of road safety and traffic congestion. The council is concerned about cyclist and pedestrian safety on Plough Way, and considers that steps should be taken to mitigate any adverse impact. The council is also concerned about general traffic congestion there and on the Lower Road gyratory and these will need to be fully assessed.

The relocation of parking to improve goods vehicle access should be assessed in the light of parking occupancy surveys, but it will be necessary to ensure that all current parking needs are accommodated. It is assumed that no parking is provided on site. Roads within Southwark in the immediate area are covered by a controlled parking zone preventing parking by site workers. Consequently, the council has no concerns about commuter traffic generation or parking. However, the council would wish to be assured that secure cycle parking will be provided on site.

7. General Matters and Mitigation

PIER Volume 2: Proposed development

In paragraph 5.2.8 of the PIER, Volume 2: Proposed development, in connection with the use of the River Thames it states that, "The horizontal alignment of the main tunnel would generally follow the River Thames where possible, because it would allow the use of the river for construction transport, where practicable and economic". The environmental benefits of this should also be taken into account.

Paragraph 5.3.55 of the report states that the 'Package contractor' will determine the delivering of material by river. As is noted above, this is not acceptable to Southwark. The council considers that it should be subject to a binding commitment.

On page 72, the figure is missing for the "Typical Schematic arrangement for active ventilation plant"

PIER Volume 5: Assessment methodologies

Paragraph 3.4.109 of the PIER, Volume 5: Assessment methodologies, only uses a typical year "October 1979 – September 1980". Where the problem would coincide with a bad year, it does not appear that the effects of climate change are being taken into account. No reference is given to the Water Research Council study and the reason for choosing the stated period. As it is predicted that certain periods will get wetter, there is a probability that the Thames Tunnel will be used more often. Within the documents there is no indication of the odour concentration around the various ventilation shafts in the borough. As it can be seen from the graph included as Appendix B, the rainfall for the typical year is 21.3mm above the 100 year average. The worst case for the amount of combined sewer overflow into the Thames Tunnel would be for the year 2000 – 2001 when the total annual (October 2000 to September 2001) rainfall was 1162.7mm. In the Environmental Statement, this year should be presented as worst case scenario for all the air quality assessments.

Page 137 in table 8.4.1 Note D the time for Sunday should be 2200 hours not 23:00 this is a Thameslink project standard.

There is no mention of noise insulation or re-housing triggers levels. There are several references to the trigger levels in the documents, but there are no references to the policy document. The Thameslink project has a twenty-nine page policy document on the noise insulation or temporary re-housing policy.

Air quality

Chambers Wharf, Shad Thames Pumping Station and Earl Pumping Station are all located within an air quality management area. Thames Water will be expected to demonstrate that proposals do not result in a reduction in air quality, through an air quality assessment, as set out in Southwark plan policy 3.8.

In paragraph 3.3.1 (c) of the Air Quality Management Plan, Thames Water states that the H_2S would be maintained for at least three years after start of operation and if records indicate good performance, such H_2S monitoring would be discounted. In another paragraph of the same document (3.5.3) it states that the H_2S monitoring would be reviewed. The H_2S monitoring should be carried out until after the first major maintenance of the Thames Tunnel, and then it should be reviewed. The H_2S monitoring is an integrated part of the monitoring system to check the odour control

plant at a central operation station. This is another good reason why the H_2S monitoring should be longer than three years and as part of BPM system.

In section four of the Air Quality Management Plan, the local authority is not included in the complaint structure.

Noise and Odour

Construction of shafts and the residual ventilation structures will also have noise and odour impacts. Proposals which do not demonstrate that they can mitigate these impacts satisfactorily would be considered unacceptable by Southwark, in line with Southwark Plan policies 3.1 and 3.2.

Paragraph 2.3.2 of the PIER Main Report, Volume 6: Project Wide effects, states that the roads A202 Camberwell to Peckham and the A2 corridor south east of the A202 junction are predicted to an increase of over 200 HGVs movements per day, which will have an adverse effect on the local air quality in an area of current poor air quality. Therefore the option of delivering and exporting of the material from the various construction sites by barges may be the best environmental option. There is no indication of the concentrations given in the volume; it is unclear whether this will be shown in the Environmental Statement.

The roads mentioned above have not been considered in the section in connection with noise and vibration because the section only includes the effects associated with the underground works.

The current noise assessment has been made on the noise – related environmental design measures as defined in the current Code of construction practices Parts A & B, however the assessment will be different when the contractor's equipment and construction sequence are known. It is suggested that a s106 agreement should be entered into to ensure that a year baseline monitoring data (Noise and Air Quality) around the various construction sites in the borough is obtained before enabling works start. For each site a Working Group is convened with representation made up from residents, local councillors, contractor, Thames Water and officers from the authority. The construction sites on the border with London Borough of Lewisham and the City of London the group should have cross borough representation.

It is not clear why there is a change in the contours in the vicinity of Tower Bridge in connection with the predicted vibration levels in Volume 6 Figure 5.4.18 TBM Ground borne noise contours.

In respect of "Volume 6 Table 5.4.4. Ground borne noise impacts from TCR" table, there is no assessment to the duration of the low impact (35 – 39 dB(A)) that the 310 residential properties. A significant period of a low impact will cause a significant impact. Also the cumulative effect of the TBM and TCR has been considered in the report. In the plan showing the Greenwich Tunnel TCR ground borne noise levels (Vol. 6 Figure 5.4.22), there is no upper limit shown for the ground borne noise contours. It is presumed from the text that the upper limit is 40dB, but this should be shown on the legend for the plan.

Flood risk

Risk of Flooding due to Groundwater

Potential elevation in groundwater levels as a result of shaft and tunnel construction schemes may introduce or increase flood risk from groundwater in the short term,

particularly in areas at high risk of flooding. For shaft construction and operation, site specific mitigation measures such as continuous dewatering during construction should be implemented in order to manage the groundwater levels and reduce risk of groundwater flooding. It is appreciated that the tunnel will be deep (at about 57m depth in Chambers Wharf) and go through bedrock in the lower aquifer; this, combined with the tunnel's relatively insignificant diameter compared to the lower aquifer thickness means it is unlikely to influence near-surface groundwater dynamics. The council recommends further assessment of groundwater flood risk (as part of EIA) following additional groundwater monitoring results to be undertaken as planned. In addition, modelling of the interaction between groundwater and surface water should be undertaken to inform the Environmental Statement (ES) on overall flood risk from the proposed schemes.

At the Chambers Wharf site, the effect of the temporary coffer dam and permanent shafts on groundwater flow is anticipated to have negligible impact; this should be further assessed and quantified in the ES. The Bermondsey area just south of the proposed Chambers Wharf shaft site has increased potential for elevated groundwater, derived from our Preliminary Flood Risk Assessment (PFRA), and has previously reported groundwater flood incident. The proximity of the Chambers Wharf site to this area enhances the need for further investigation and quantification of the effects of construction work on near-surface groundwater dynamics.

Risk of Flooding due to Surface Water

The Thames Tunnel Code of Construction Practice (CoCP, section 8.2.3) provides information on general requirements for limiting flows from site to ensure no increase in runoff rates unless otherwise agreed, and site specific (Flood Risk Assessment) FRAs recommend that measures for limiting and controlling runoff flows from site are undertaken. The council recommends that detailed measures are developed and implemented during the construction and operational phases of the schemes. The council recommends that opportunities to reduce existing site runoff must be explored as all sites (Earl Pumping Station, Chamber Wharf and Shad Pumping Station) are within or near areas vulnerable to surface water flooding. It is therefore recommended that conclusive assessments of risk of surface water flooding due to runoff from surrounding areas should be undertaken as part of ES.

Impact of future climate change to be simulated and effect on surface water flood risk fully understood and made available in the ES.

Although the three sites are currently 100% hard standing, reduction/attenuation of the velocity and volume of runoff must be considered in order to reduce the risk of flooding to surrounding areas. The council recommends that post-development mitigation measures (e.g. to meet PPS25 30% runoff increase due to climate change and Mayor's Draft Water Strategy to attenuate 50% of undeveloped runoff) are assessed, with additional investigations on feasibility of attenuation/infiltration SUDs and on potential to route flows away from site as well as from vulnerable properties. The council also recommends the reduction of currently proposed hard standing areas and introduction of permeable paving/soft landscaping in order to mitigate runoff contribution to surrounding developments.

The proposed coffer dam, raised to current tidal flood defence levels, could cause accumulation of surface water from rainfall in the working area during construction and necessitate periodic pumping of rainwater into the River Thames. Control of surface water from rainfall should be implemented during construction, as per CoCP (with contingencies for pumping failure), to ensure that flood risk from surface water on site is effectively reduced. Site specific methodologies and risk assessments should be

established (for construction and operation phases), and LBS should be engaged with on the proposals.

Risk of Flooding due to Sewer Overload
Introduction of flow discharges from construction site dewatering activities into sewers may reduce storm water capacity and lead to a peak in the local system network, which would increase the risk of flooding. It is recommended that appropriate management of pumped flows from dewatering must be developed and implemented on a site specific basis during construction. While the CoCP states that water management will be in place during construction, site specific methodologies and risk assessments should be established (for construction and operation phases) and LBS should be engaged with on the proposals.

At Shad Pumping Station, the proposal to inhibit pumping flows from existing CSO into the River Thames, utilise storage in upstream sewers and pump storm water from the pumping station into River Thames in extreme rainfall events could increase flood risk in the event of pump failure. The residual risk of flooding (and extent) due to pumping failure should be identified and mitigation measures identified and incorporated.

Risk of Flooding due to Impact of Tunnel Construction on Tidal Defences
Although management of tidal flood risk falls outside remit of London Borough of Southwark, the impact of a failure on the Thames Tidal Defence could lead to increased flood risk in surrounding developed areas of the borough. A detailed study of impact of tunnelling on flood defence settlement should be undertaken and included in ES as proposed in the PEIR.

Planning Obligations

In the event that the Secretary of State deems it appropriate to grant development consent for the Thames Tideway Tunnel, the council would expect adequate planning obligations to mitigate the adverse impacts of the development on a wide range of matters including in respect of the following non-exhaustive impacts on heritage, open space, community facilities, residential and visual amenity, transport and sustainability, employment and local procurement, public realm, other community impacts and costs of S106 administration. Further matters and issues for mitigation are likely to emerge as a detailed scheme is developed.

At this stage, it is evident the following (non-exhaustive) items would require considerable mitigation though conditions and in some cases perhaps S106 obligations;

- Archaeological investigation and mitigation and,
- Construction management plan (noise, dirt, hours), including monitoring,
- Transportation mitigation,
- Air quality monitoring and mitigation measures,
- Noise and vibration monitoring and mitigation measures.
- Sustainability mitigation

Further items may be identified as more detailed proposals emerge.

Sustainability Appraisal

The construction of the tunnel is likely to have significant social, economic and environmental impacts. Thames Water has indicated that planning proposals will be subject to environmental impact assessment (EIA). The PIER states (PIER Main

Report, Volume 4, Scoping Opinions and Technical Engagement, page 17) that no response was received from London Borough of Southwark during the consultation on the scoping report. However, Southwark submitted the response (attached as appendix B) to Thames Water on the 21st July 2011. The response raised concerns over a number of issues, including the lack of heritage consideration.

Whilst any future applications affecting Southwark sites will be subject to an environmental impact assessment, it should be noted that an EIA tests the environmental impacts of a particular development. In 2005, the Thames Water Tideway Strategic Study indentified a number of strategic options for addressing the environmental problems of CSOs and concluded that the Thames Tideway Tunnel was the preferred option. Whilst this study included a regulatory impact assessment, it is not clear whether the identified options were subjected to any sustainability or environmental appraisal before selecting the Thames Tideway Tunnel or the preferred route.

The government has recently consulted on the draft National Policy Statement for Waste Water which addresses the need for nationally significant infrastructure projects and includes specific reference to the Thames Tideway Tunnel. Whilst the draft NPS is the subject of a separate consultation response, it is noted that it relies heavily on the 2005 Strategic Study which is purported to have tested various strategic and technical options. Akin to Thames Water, the NPS states that Thames Tunnel is the preferred infrastructure solution and that the sustainability appraisal will include "an assessment of the specific aspects" of the Thames Tunnel proposal. The tone of the NPS suggest strongly that options should have been subject to sustainability appraisal at the time the 2005 study was conducted.

It is a mandatory requirement under Directive 2001/42/EC for a Strategic Environmental Assessment to be submitted with plans/programmes which are prepared for waste and/or water management where they require the amendment of a Land Use plan. The SEA is required to include an assessment of alternatives against the SEA objectives, provided there is sufficient detail to identify the significant environmental effects of each alternative. Where appropriate any cumulative, secondary and synergistic, short, medium, and long-term effects need to be highlighted, indicating whether they are likely to be permanent or temporary. In this respect, Southwark Council contend an SEA was required to adequately assess the cumulative impact of development and assess the positives and negative impacts of the scheme against other viable alternatives. Southwark Council also considers that LPAs are best placed to assess the implications of SEAs and the cumulative impacts of the proposals would affect their local areas. LPAs are therefore also best placed to determine whether the assessment of alternatives is appropriate and realistic and should be involved in the SA process from the start. To the best of Southwark's knowledge no SEA assessment of alternatives has been carried out in respect of the Thames Tunnel proposals or its alternatives. The lack of iterative sustainability testing remains an outstanding issue of concern which undermines the environmental case for the Thames Tideway Tunnel.

Southwark Council wishes to reiterate the findings of the commission and ask for a further assessment of the wider impacts of the proposal and its alternatives, in social, economic and environmental terms.

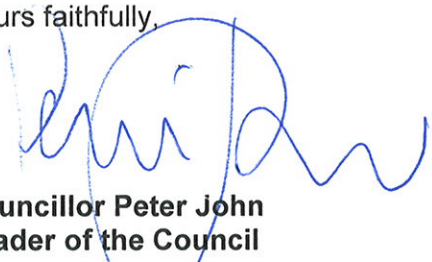
8. The National Planning Policy Statement (NPS) for Waste Water

When published, the NPS for Waste Water will set out the Government policy for the provision of the major waste water infrastructure, including the Thames Tunnel project. In accordance with the Planning Act 2008, the NPS will be used by the Infrastructure Planning Commission to guide its assessment on development consent applications, including the Thames Tunnel. It will therefore be a key document in the decision making process.

While not the subject of the current consultation, it should be noted that it is Southwark's view that the National Policy Statement (NPS) on Waste Water should not pre-empt the role of the planning process to determine whether the Thames Tunnel meets the criteria for major waste water developments. The role of NPS is to identify need and plan for infrastructure. Southwark objected to Defra's consultation on the draft NPS on those grounds. This issue, coupled with the lack of appropriate environmental testing of alternative options raises significant concerns for the council.

We trust that these comments will be given due consideration in the preparation of the development consent order for submission to the IPC.

Yours faithfully,



Councillor Peter John
Leader of the Council

Appendix A: LBS' response to Thames Water's stage one consultation of the proposed route and sites of the Thames Tunnel, January 2011
Appendix B: LBS' response to the EIA scoping report, July 2011

Appendix 4 Barge feasibility assessment

APPENDIX B

Pell Frischmann

excellence through innovation

The use of the River Lea for transportation of spoil materials

Feasibility Study

Thames Tideway Tunnel
Abbey Mills Pumping Station

October 2013

R12537T201

REVISION RECORD Report Ref: R12537T201					
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CONTENTS

1. INTRODUCTION

1.1 Objective

1.1.1 Pell Frischmann has been appointed in September 2013 by London Borough of Southwark to produce a detailed assessment to determine whether it is feasible to use the River Lee for transportation of spoil materials from Abbey Mills and whether the site could be used as a drive site for tunnelling towards Chambers Wharf.

1.1.2 The study also examines infrastructure requirements, changes to programme and cost implications arising to allow such fundamental changes to the Abbey Mills Pumping Station site use.

1.2 Background

1.2.1 The proposed Thames Tideway Tunnel (TTT) construction project, with its alignment generally following the River Thames, lends itself to using waterborne logistics during its construction and the project is committed to transport excavated material by barges where possible.

1.2.2 Abbey Mills Pumping Station has been identified as one of the 24 sites for constructing the TTT with the site currently proposed to be used as a main tunnel reception site from Chambers Wharf. The discharges from the combined sewer overflows (CSOs), collected by the TTT would then be transferred via the Lee Tunnel to Beckton Sewage Treatment Works. There would be no requirement for a new CSO Interception at Abbey Mills Pumping Station as part of the Thames Tideway Tunnel as the Abbey Mills CSO will have already been intercepted by the Lee Tunnel.

1.2.3 Currently it is planned that approximately 5.5km of 7.2m internal (8.8m external) diameter tunnel would be driven east from Chambers Wharf using a tunnel boring machine (TBM) with a slurry shield to be received at Abbey Mills Pumping Station. The main tunnel shaft (internal diameter of 25m and 72m in depth) would be the reception point for the TBM and be constructed adjacent to the Lee Tunnel shaft within the operational pumping station site. A short connection tunnel would then be constructed between the two shafts to connect the tunnels.

1.3 Scope of the report

1.3.1 The report comprises the following sections:

- Site Selection – overview of the selection process for Abbey Mills Pumping Station CSO at Phase 1, Phase 2, Section 48 and DCO consultation stages,
- Site Appraisal – description of the site and a summary of its role in the Lee Tunnel,
- Site Assessment – Calculation of the parameters associated with a drive site
- Barge use Assessment – Examines the number of barges required and the constraints arising from the tidal nature and geometry of the River Lee ,
- Proposed Strategy – provides an overview of requirements and an indicative barging strategy which would appear to be feasible for the site,
- Infrastructure Assessment – Estimate of the associated infrastructure required and any associated costs,
- Conclusions – summarises whether it is feasible to use Abbey Mills PS as a main drive site and to what extent the Lee River is suitable for waterborne transportation.

2. SITE SELECTION

2.1 Phase 1 Consultation Proposal – September 2010 to January 2011

2.1.1 Three possible sites were initially identified as main tunnel eastern drive sites within the phase 1 consultation process:

- Three Mills Studios,
- Three Mills Green, and
- Abbey Mills Pumping Station.

2.1.2 At consultation, Abbey Mills Pumping Station was identified as the preferred site to drive the main tunnel to King's Stairs Gardens. The reasons were as follow:

- Abbey Mills Pumping Station site is owned by Thames Water and should therefore be utilised as far as is reasonably possible.
- Driving the main tunnel from Abbey Mills PS would reduce the impact on the public open space and residential areas at King's Stairs Gardens, although a long connection tunnel to pick up three CSO's, would need to be constructed from the King's Stairs Gardens site and a second connection tunnel to pick up a fourth CSO would also be received at the site. The neighbouring residential area would therefore still be affected, though to a lesser extent.
- Abbey Mills PS site is relatively unconstrained compared to King's Stairs Gardens, particularly in terms of its operational nature, and there are fewer sensitive receptors in the area. It is however located in a conservative area.
- It was more likely that noise and air quality could be adequately mitigated for a main tunnel drive shaft site at Abbey Mills PS than at King's Stairs Gardens.
- There could be a compensation cost associated with the reprovision of open space which would be lost at King's Stairs Gardens.

2.2 Phase 2 Consultation Proposal – November 2011 to February 2012

2.2.1 During this consultation phase it was proposed that Abbey Mills Pumping Station should remain as a preferred main tunnel site albeit with a change of function. The tunnelling strategy was revised both in tunnelling direction and site location. The King's Stairs Gardens site was replaced by Chambers Wharf, where from it was decided to drive the main tunnel to Abbey Mills Pumping Station. Abbey Mills Pumping Station therefore become a main tunnel RECEPTION site rather than a main tunnel DRIVE site.

2.2.2 The reasons for these changes were as follows:

- Discussion with the Thames Water Lee Tunnel project team, which was then building a shaft at Abbey Mill Pumping Station, was quoted that transporting material to and from the site by River Lee and Bow Creek was at worse not feasible and at best highly undesirable where materials needed to be transported daily over a two to three year period. It was noted that a similar level of barge movements would be required if the site were used as main tunnel drive site, given the volume of excavated material that would be produced by the 24/7 tunnelling strategy.
- At Chambers Wharf, it was noted that 1,500tonne barges could be used on the River Thames to remove excavated material whereas it was noted that Abbey Mills Pumping Station possessed more constraints in having to use Bow Creek to remove

the excavated material. It was cited that only relatively small 350 tonne barges could be used during a short tidal window. Smaller capacity barges were then being used by Lee Tunnel project for these reasons.

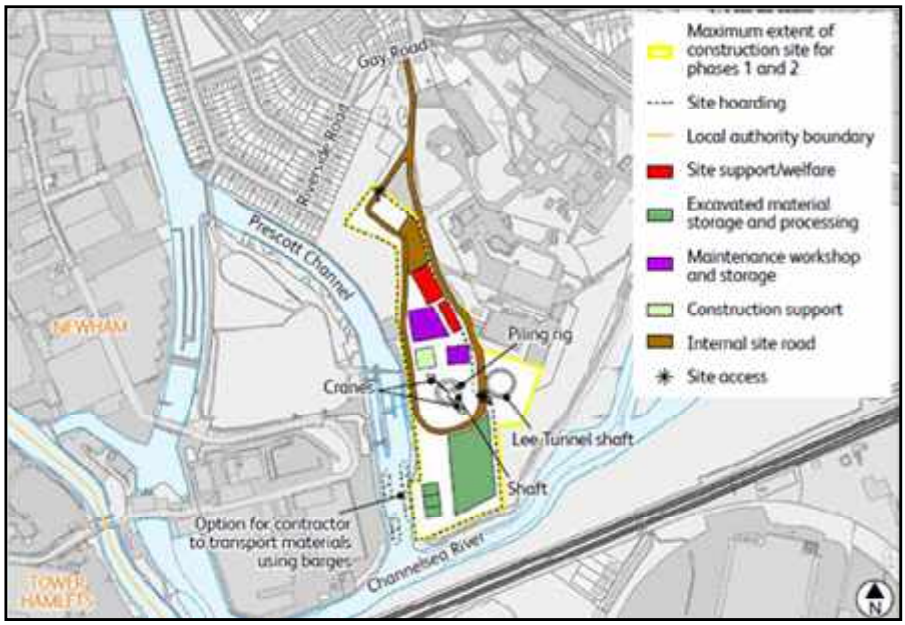


Figure 2.1: Phase 2 Consultation proposal *(Abbey Mill Pumping Station Site Information Paper)*

2.3 Post phase two consultation review – June 2012 to July 2012

2.3.1 The main objections, issues and concerns raised relevant to Abbey Mills PS site selection were summarised as follows:

- Object to the use of this preferred site and changes to the proposed use of the preferred site since phase one consultation,
- Query why shortlisted sites have not been identified,
- Site selection should avoid sites in residential and/or densely populated areas/ the scale of effects on the local area and community resulting from the selection of this site is unacceptable/has not been properly considered,
- The drive strategy and associated use of this site needs to be reconsidered; specifically instead of Chambers Wharf,
- The reasons for selecting this preferred site are flawed/questionable.

2.3.2 The main supportive and neutral feedback comments received included:

- Support for the use of the site/support the changes to the proposed use of the preferred site since phase one consultation
- The site is a suitable size and/or has sufficient capacity to accommodate the proposals
- The site is already an operational Thames Water site/is owned by Thames Water
- The effects associated with selection of this site can be managed through mitigation
- Qualified support subject to clarification being provided as to why the Lee Tunnel shaft cannot be used as the reception shaft instead of constructing a new shaft.

2.3.3 In light of the comments, it was concluded that Abbey Mills Pumping Station remained the most suitable main tunnel reception site to construct the eastern sections of the main tunnel.

2.3.4 The feedback received from the Lee Tunnel project was that whilst barging of excavated spoil from Abbey Mills is technically feasible, much larger volumes of spoil would arise if Abbey Mills were a main tunnel drive site and this amount could not be transported by barge. This is because of the limited tidal window and the time needed to navigate the tortuous River Lee up to Abbey Mills, and the inability of barges to operate at Abbey Mills at all during certain tidal conditions. This reinforced the assessment that Abbey Mills was not suitable as a main tunnel drive site but remained the most suitable main tunnel reception site providing as it does, the necessary connection to Lee Tunnel and onwards to Beckton STW.

2.4 Section 48 Proposal – July 2012 to October 2012

2.4.1 The TWU section 48 proposal confirmed that Abbey Mills Pumping Station remained the preferred main tunnel reception site to receive the eastern section of the main tunnel driven east from Chambers Wharf.

2.5 Post Section 48 publicity review – Autumn 2012

2.5.1 This stage of consultation comprised a review of comments from Section 48 publicity related to main tunnel sites and tunnelling options associated with the eastern sections of the main tunnel construction.

2.5.2 The main concerns raised relevant to site selection were summarised as follows:

- Due to its location, the site should be explored as a main drive site.
- The tunnelling strategy and associated use of this site needs to be reconsidered. The site should be used as a main tunnel drive site because it is in the middle of an industrial area and it is an opportunity to provide a future asset by improving river access.

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

- Qualified support subject to further clarification regarding use of the site.

2.5.4 Thames Water review of the site confirmed that there was no new project design issues and/or new technical information relevant to site selection. In this instance, Abbey Mills Pumping Station was selected as the main tunnel reception site to receive the main tunnel drive from Chambers Wharf.

2.6 DCO Proposal – February 2013

2.6.1 Abbey Mills Pumping Station was selected as the main tunnel reception site for the application for the following reasons:

- It is an available brownfield site with operational Thames Water works.
- This site is adjacent to Lee Tunnel shaft “F” which would provide the most efficient way to transfer flows from the Thames Tideway Tunnel to the Lee Tunnel and subsequently to Beckton Sewage Treatment Works.
- There are a number of applicable planning designations in the vicinity of the site. However, careful consideration of the location of some of the construction works

and site access and appropriate mitigation should avoid an unacceptable level of impact.

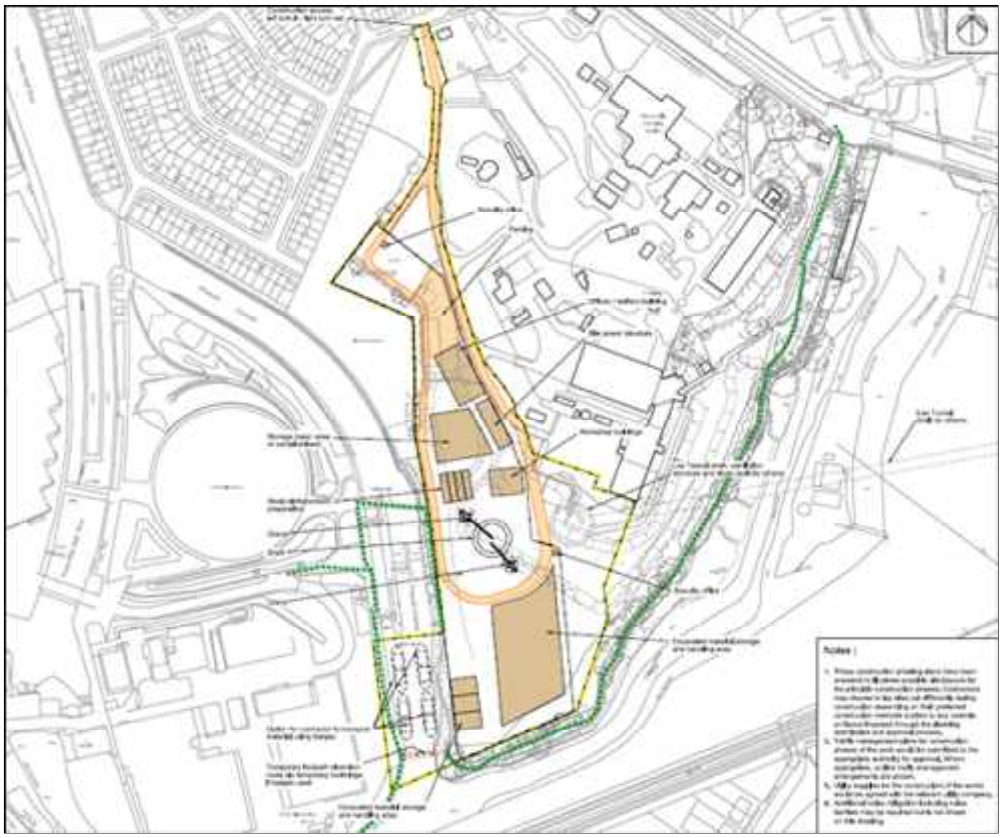


Figure 2.2: DCO proposal *(Abbey Mills Pumping Station - Book of Plans Doc. Ref 2.27)*

2.6.2 The current proposal assumes construction to begin in 2018 and would be complete by 2021 (four years) and will involve the following phases[1]:

- Site Year 1 – Site set up (4 months)
- Site Year 1 to 2 – Main Tunnel shaft construction (15 months)
- Site Year 2 to 3 – Tunnelling / TBM reception and main tunnel secondary lining (8 months)
- Site Year 3 – Construction of other structures (7 months)
- Site Year 3 to 4 – Completion of works and site restoration (10 months)

2.6.3 It is noted that the assumed average peak daily construction lorry vehicle movements (in peak month of Site Year 2 of construction) will involve 140 vehicle trips per day which accounts for 280 movements and will last 1 month[2].

[1] Environmental Statement (Doc Ref 6.2.25)
[2] Transport Assessment (Doc Ref 7.10.22)

3. SITE APPRAISAL

3.1 Description

3.1.1 The Abbey Mills Pumping Station site is located within the London Borough of Newham. It comprises an area of greenfield land to the south of the Abbey Mills Pumping Station which is currently being used for the construction of Lee Tunnel as shown on Figure 3.1.

3.1.2 The site is wholly contained within land owned by Thames Water, and is bounded to the north by Thames Water operational infrastructure and buildings. To the west, the site is bounded by the Prescott Channel and allotments, and to the south east by the Channelsea River and Abbey Creek. To the east of the site beyond the Channelsea River is an area of disused land and the Channelsea Business Centre, located on Canning Road.

3.1.3 It is accepted by both the scheme promoter (Thames Water) and other major stakeholders that the site offers potential for waterborne logistics to be used, albeit as it can only be accessed via the tidal Bow Creek, it has inherent constraints.

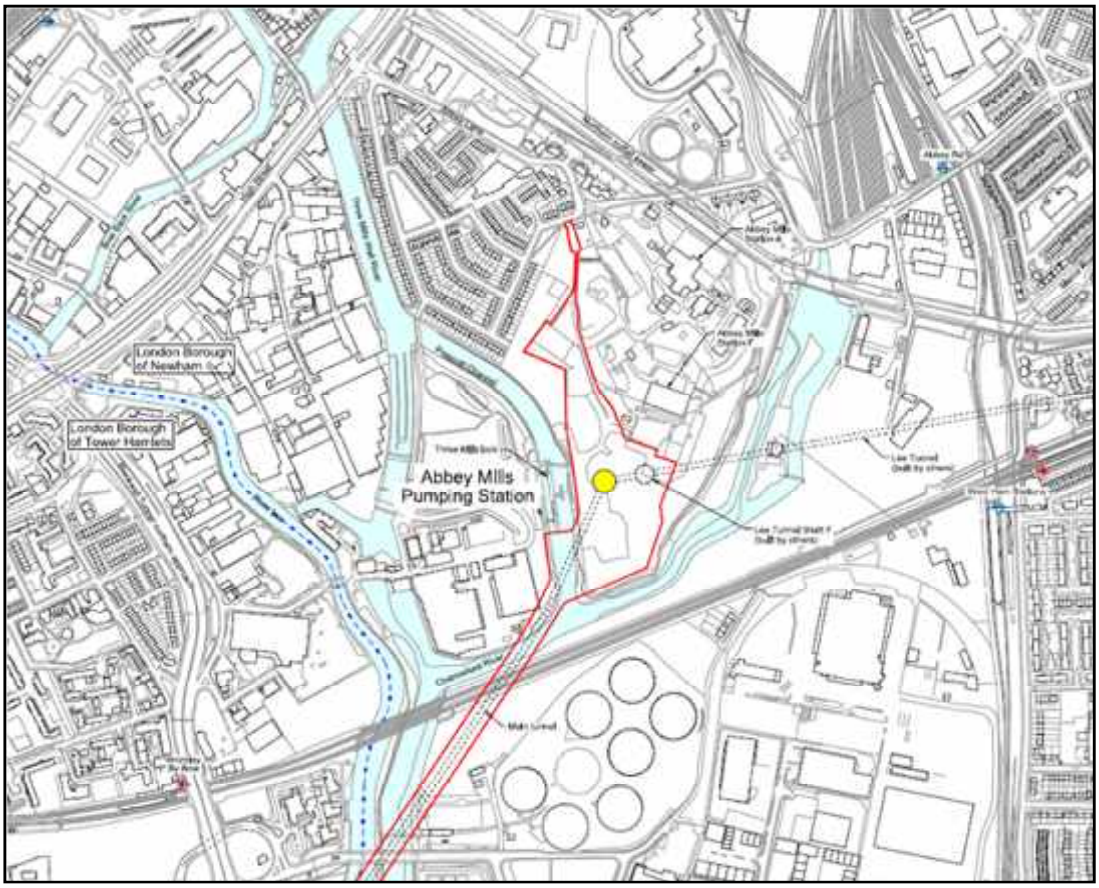


Figure 3.1: Abbey Mills Pumping Station- Site Location *(Abbey Mills Pumping Station - Book of Plans Doc. Ref 2.27)*

3.2 Lee Tunnel Summary

3.2.1 The Lee Tunnel is a sewage and transfer tunnel between two existing Thames Water sites: Abbey Mills Pumping Station and Beckton Sewage Treatment Works. The tunnel is 6.9km long at a depth of approximately 55 to 75m below ground level.

3.2.2 Construction work started in September 2010 to build the 80-metre-deep shaft at Beckton sewage works, where the tunnel was driven from. Tunnelling for this project is also taking place through chalk commencing in early in 2012 and expected to finish in late 2013.

Works at Beckton also included a connection shaft and a pumping shaft to pump outflow from the Lee Tunnel, an overflow shaft and an Outfall Culvert with associated necessary mechanical and electrical plant.

3.2.3 The site at Abbey Mills Pumping Station comprised the construction of shaft known as 'F' and a new culvert between this shaft and the Northern Outfall Sewer as well as alterations to existing minor infrastructure. For information and comparison purposes the Abbey Mills PS site layout for Lee Tunnel construction is shown in Figure 3.2.

3.2.4 The overall logistics for the Lee Tunnel project was based on delivery of goods by road and removal of spoil by barges for shaft construction only. Other spoil was to be removed by road.

3.2.5 The excavated material arising from the shaft was removed utilising cranes and skips and was temporarily stored in an enclosed spoil bin for transfer to barge by grab crane or excavator. The total spoil associated with Lee Tunnel construction was estimated to be 1,734,000 tonnes, 129,000 tonnes of which was produced by the excavation of connection shaft F at Abbey Mills. All of this spoil was proposed to and has been to our knowledge taken away by barge.

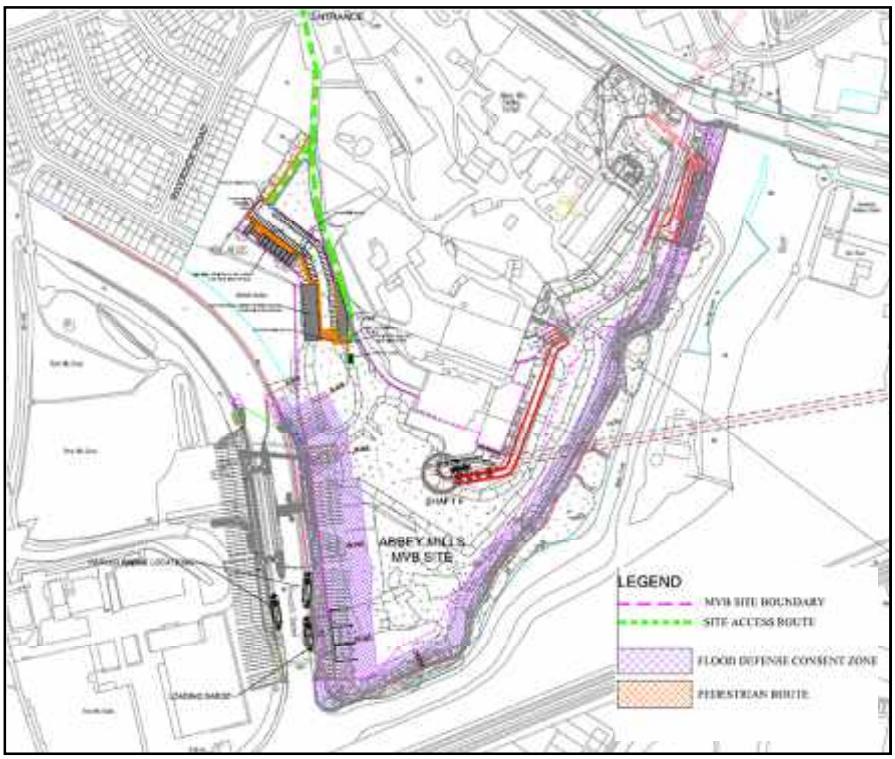


Figure 3.2: Abbey Mills PS site during the Lee Tunnel construction *(Abbey Mills Construction Management Plan, August 2010, produced by MVB)*

4. SITE ASSESSMENT

4.1 Introduction

4.1.1 As noted form section 2 the proposed use for the Abbey Mills Pumping Station site is as a main tunnel reception site. The objective of this section is to assess whether the site has the potential to be used as a main tunnel drive site whilst maintaining the scheme promoters commitment to taking 90% of the spoil away by river.

4.1.2 Between Abbey Mills Pumping Station and Chambers Wharf, it will be necessary to tunnel through chalk. As such, a Slurry Face Tunnelling Boring Machine will need to be used. The working principle of these machines is to add bentonite slurry (a mixture of clay and water) in a pressurized environment to the tunnel excavation face. The excavated spoil will then be pumped out as a liquid to a slurry treatment plant, where processes to reduce the water content to be within transportable moisture limit (TML) will take place and enable transportation. The spoil in the form of cakes or slabs would need to be stockpiled before transporting off the site.

4.1.3 To assess the feasibility we shall examine the following:

- Construction programme
- Excavated solid material,
- Volume of slurry,
- Slurry treatment
- Volume of chalk cakes,
- Area required for stockpiling,
- Area required for tunnel segment storage

4.2 Construction programme

4.2.1 As highlighted in section 2.6 the current proposed programme for Abbey Mills Pumping Station comprises 4 years of construction works and the current transport strategy assumes that all excavated material from shaft construction will be transported by road. During the most intensive construction period the impact on the surrounding road network will be 140 lorries per day (equivalent to 280 lorry movement), which will last for 1 month.

4.2.2 This report examines the possibility of changing this use to that of a main tunnel drive site and hence will involve the logistics of driving a tunnel through 5.5km of chalk. Using the construction programme produced for Chambers Wharf in the published DCO submission as a basis, it is anticipated that there would be an increase of 2 years in the construction period. An indicative programme for Abbey Mills Pumping Station would therefore be as follows:

- Site Year 1 – Site set up (4-8 month)
- Site Year 1 to 2 – Main Tunnel shaft construction (15 months)
- Site Year 3 to 4 – Tunnelling (25 months)
- Site Year 5 – Secondary lining (8 months)
- Site Year 5 to 6 – Construction of other structures (7 months)
- Site Year 6 – Completion of works and site restoration (10 months)

4.2.3 Due to these changes in construction works at Abbey Mills PS, and to align with current scheme promoter commitments for waterborne logistics we shall examine the possible transportation of the following materials:

- Excavated material from shaft construction,
- Excavated material from main tunnel construction, and

4.3 Excavated solid material

4.3.1 The volume of excavated materials are based on the geometric parameters of the tunnel and shaft as published in DCO material, while the weight has been estimated based on the widely accepted density of chalk being 2499kg/m^3.

4.3.2 Abbey Mills Shaft

4.3.3 The size of Abbey Mills Shaft is listed as:

- Depth of shaft 72m,
- Diameter of the shaft 25m

4.3.4 Thus the total volume of excavated solid chalk has been calculated to be 35,530m^3 which is equivalent to 88,322 tonnes.

4.3.5 Main Tunnel between Abbey Mills and Chambers Wharf

4.3.6 Main tunnel geometrics:

- Length of tunnel[3] 5500m,
- Internal diameter of the tunnel[4] 7.2m
- External diameter of the tunnel 8.8m

4.3.7 Using these parameters the total volume of excavated solid chalk 334,516m^3, which is equivalent to 836,000 tonnes.

4.3.8 The expectation by the scheme promoter for the TTT scheme, and one used in the basis of programmes shown within the DCO, is that an average tunnelling rate of 90-100m per week shall be achieved. This however means that for a robust assessment and in order to allow for periodic downtime in tunnelling for maintenance of the TBM etc, the site, infrastructure and logistics strategy must be capable of handling a peak tunnelling rate.

4.3.9 Using similar tunnelling projects as exemplars we would note the following. Expectation from Crossrail in 2003-04 was 140m week but 200m/week was regularly achieved. Similarly, CTRL Contract 240 from Kings Cross to Barking had 'best' rates of 282m/week in a 7 day period, 257m/week in a 14 day period and 232m/week in a 28 day period.

4.3.10 It is accepted that tunnelling in chalk possesses its own inherent difficulties as it is essentially done using a wet process with the resultant material sticky and difficult to handle – hence the need for a Slurry treatment plant. In order to provide a robust assessment we shall base this study's calculations on a peak rate of 200m/week or 29m/day.

4.3.11 This robust assessment therefore equates to an equivalent volume of 1764m^3 or 4,400 tonnes per day.

[3] As per Environmental Statement Volume 24 Greenwich Pumping Station (Doc Ref; 6.2.24)
[4] As per Environmental Statement Volume 24 Greenwich Pumping Station (Doc Ref; 6.2.24)

4.4 Volume of slurry

4.4.1 Slurry is a mixture of solid chalk and bentonite, with an accepted bulking factor of 2 compared to that of solid chalk. Based on this assumption and the chalk density provided in section 4.3, the daily slurry volume is estimated to be 3600m^3 per day.

4.5 Slurry Treatment

4.5.1 Due to the specific condition of the site, namely:

- Tunnelling trough solid chalk,
- Excavated material being chalk slurry,
- Requirement for slurry treatment to reduce moisture content,
- Moisture content remaining within the chalk cakes,

there is a risk for liquefaction during the transportation and thus appropriate measures will need to be undertaken prior to transportation of spoil to ensure safety.

4.5.2 The International Maritime Solid Bulk Cargoes Code (IMSBC Code) supply the correct information such as moisture content, Transportable Moisture Limit (TML), Flow Moisture Point (FMP) sets the required tests and precautions needed to be taken into account prior to transport the material to prevent liquefaction.

4.5.3 Cargos which contain a certain proportion of fine particles and a certain amount of moisture may liquefy when a moisture content in excess of their transportable moisture limit.

4.5.4 Flow Moisture Point (FMP) is the maximum water contents, expressed as percentages, at which a sample of cargo begin to loos shear strength. Cargoes with moisture content beyond FMP may be liable liquefy. The Transportable Moisture Limit (TML) is defined as 90% of the FMP.

4.5.5 A slurry treatment plant addresses this issue as it provides two basic functions. It prepares the bentonite slurry by mixing the slurry for use in the tunnelling process, and treats the used slurry (slurry discharge) so that it is within the TML.

4.5.6 A brief description of the process is that the slurry discharge is pumped out via pipeline to the ground surface where it undergoes a separation process for spoil removal. The primary screening equipment is the first part of STP to encounter the cuttings or contaminated slurry as it is pumped from the head of the TBM. From the primary screens the slurry will be pumped to the de-sanding and de-silting plant which normally comprises hydrocyclones and dewatering screens. The processed fluid from the desanding and desilting stage is usually pumped back to the TBM whilst the resultant solid chalk can be made into cakes for transportation.

4.5.7 A typical STP for a large diameter slurry TBM will therefore need to include the following:

- Bentonite mixing equipment, storage tank, pipework and pumps,
- Slurry storage tank,
- Primary screening equipment,
- Pumps, hydrocyclones, dewatering screens,
- Fine particle separation and flocculation plant,
- Conveyors, solids handling conveyors.

4.5.8 Using Crossrail as an example, the layout of a slurry treatment plant similar to that currently being used in East London is presented in Figure 4.1. We shall therefore use this as the basis for layout parameters and sizing.

4.5.9 From section 4.4 a slurry volume of 3,600m^3 per day will be produced with the robust assessment. Production of slurry volumes such as this will require a slurry treatment plant of a size that requires an area between 2,000-3,000m^2 as the operating capacity of such a plant is between 700 and 1.000m^3/hr so can manage such quantities.

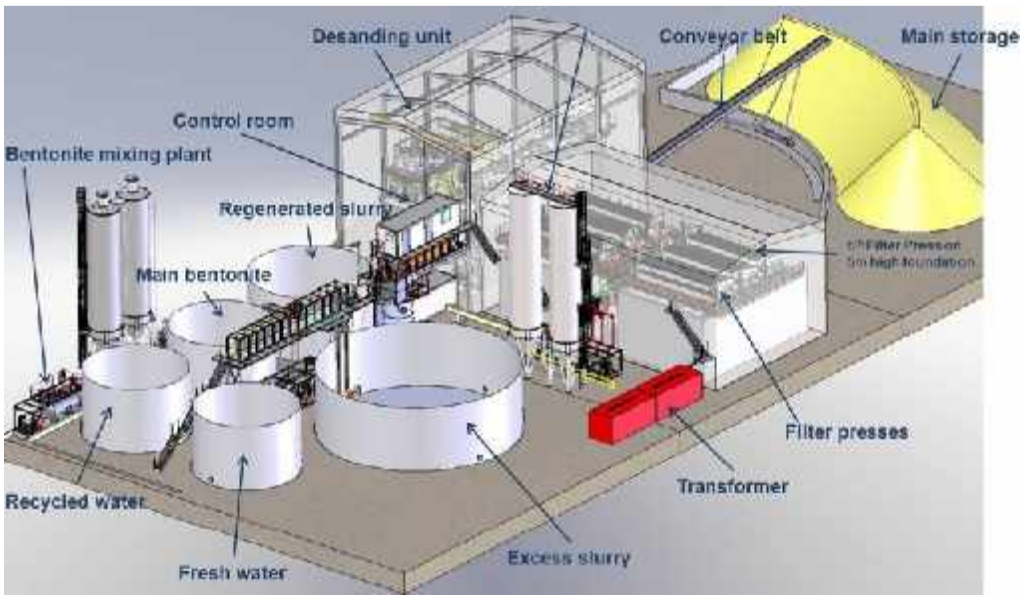


Figure 4.1: Slurry Treatment Plant at Plumstead for Crossrail 2

4.6 Volume of chalk cakes

4.6.1 The processes described above will recreate the excavated chalk into cakes. As estimated in section 4.3 the daily amount of solid chalk is 1764m^3 and therefore applying a reasonable bulking factor of 1.3, the daily excavated volumes equates to 2,300m^3 per day.

4.7 Area required for stockpiling

4.7.1 According to *"Construction Code of Practice for the Sustainable use of Soil on Construction Sites"* a stockpiling height of 3 to 4m is commonly used. The method of stockpiling depends on soil moisture and consistency though in this case we are analysing chalk cakes. Again, for a robust assessment we shall assume that the stockpiling will follow the geometric parameters:

- Angle of repose – 35 degree
- Height of stockpiling -2m

4.7.2 Two options for stockpiling methodology are shown in figures 4.2 and 4.3. Again, for a robust assessment we shall allow for a stockpile capacity of 2 days hence 4,600m^3. Using this volume an area of between 3,500m^2 and 4,000m^2 will be required.

4.7.3 It should be noted that the area required to store excavated material could be further reduced by increasing the height of stockpiling to 3 or 4m if needed.

Figure 4.2: Stockpiling Option 1

Figure 4.3: Stockpiling Option 2

4.8 Area required for tunnel segment storage

4.8.1 The size of each tunnel segment for the main tunnel is estimated as being 1.7m x 4.0m in that each 'ring' shall be 1.7m long and made up of 7 segments each 4m long. Based on the assumption that the tunnel segment will be stored as shown on Figure 4.4, ie each stack comprising 7 segments ie 1 full ring, and allowing for a clearance of 600mm between each pile, the area required for one segment pile is approximately 10.6m^2 (2.3m x 4.6m)

4.8.2 As assumed in section 4.3, a tunnelling speed of 29m per day has been used for the robust assessment, equivalent to 18 rings. The current commitment within the DCO application is for segments to be transported by road. As shown later in this study, transportation of excavated material by river shall require full unhindered use of Bow Creek and wharfage at the site so this report continues with the road based strategy for tunnel segment delivery. For a robust assessment it is reasonable to allow a stockpile of 2 days segments to be accommodated, remembering that the 29m daily rate is based on peak. The area required to store 2 days worth of segments will therefore be 380m^2 and to create a further buffer in calculation we have allowed 500m^2 on our site layout.

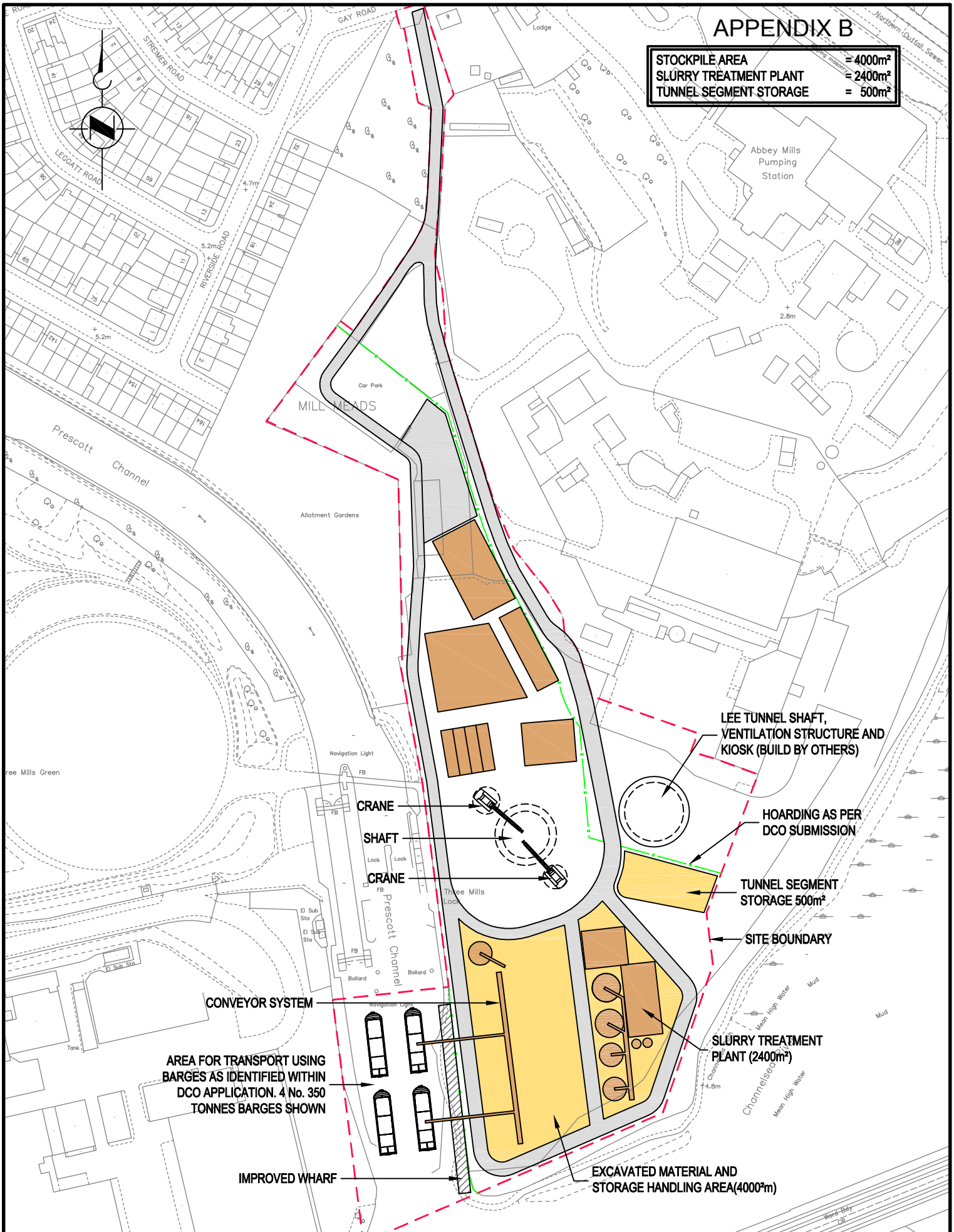
Figure 4.4: Tunnel Segments

4.9 Potential Site Layout

4.9.1 The total site area for Abbey Mills Pumping Station as shown in the DCO application is over 30,000m^2 with the southern part of the site affording the greatest potential for tunnel segment and excavated material stockpiling. From the above it is anticipated that the following areas will need to be accommodated to facilitate river transportation; Slurry Treatment Plant 2,400m^2, stockpiling two days of excavated material 4,000m^2, over 2 days stock of tunnel segments 500m^2. There will also be a need to allocate internal vehicle access routes. A provisional layout for the site, thought to be workable is shown overleaf.

APPENDIX B

STOCKPILE AREA	= 4000m²
SLURRY TREATMENT PLANT	= 2400m²
TUNNEL SEGMENT STORAGE	= 500m²



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Project: THAMES TIDEWAY TUNNEL

Drawing Title: ABBEY MILLS PUMPING STATION PROVISIONAL LAYOUT

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Drawn	GRH	25.09.13
Designed	ML	25.09.13
Checked	ML	25.09.13
Approved	AT	25.09.13

Scale: 1:2000 @ A4

File No.: 12537-C-02.dwg

Drawing Status:

Drawing No.: A12537-C-02

Revision: -

5. BARGE USE ASSESSMENT

5.1 Introduction

5.1.1 In this section we appraise what is required to transport the excavated material from the site. It sets out and assesses the constraints associated with the Abbey Mills site which possesses a tidal river frontage, in order to produce an indicative operation strategy as close to that committed to by the scheme promoter for TTT in that 90% of the excavated material from the main tunnelling operations are to be disposed of by waterborne logistics.

5.2 Number of barges required

5.2.1 As stated in section 4, the total daily amount of excavated material is 4,400 tonnes. In basic terms to maintain peak tunnelling rates, and assuming a single barge capacity of 350 tonnes, the site would need to be served by 13 barges a day to transport excavated material. It is noted that the foreshore of the site is large enough to accommodate 4 barges of that size at any one time (two barges loading and two barges waiting).

5.3 Tidal Constraints

5.3.1 The River Thames, Bow Creek and Lee River are tidal and subject to a variable (but highly predictable) semi-diurnal regime. In essence, the water levels are influenced by gravitational effects which result from the combined relative position of the earth, the sun and the moon. Spring tides (when the moon, earth, and sun are all in alignment) occur every two weeks (approximately) and Neap tides (when the moon is not in alignment with the earth and the sun) occur during the intervening period (approximately).

5.3.2 Spring tides are characterised by greater extremes of high and low water which tend to last for shorter time durations. Neap tides are characterised by less extreme high and low waters, but each HW and LW tends to last for a longer period.

5.3.3 To illustrate the effect that effect that tides can have on navigation, the following figures have to be studied. The first figure 5.1 illustrates that, to navigate below a bridge, the Under Keel Clearance (UKC) and the Air Draft must both have positive values (if UKC is negative, the barge will ground and if air draft is negative, the tug will strike the bridge).

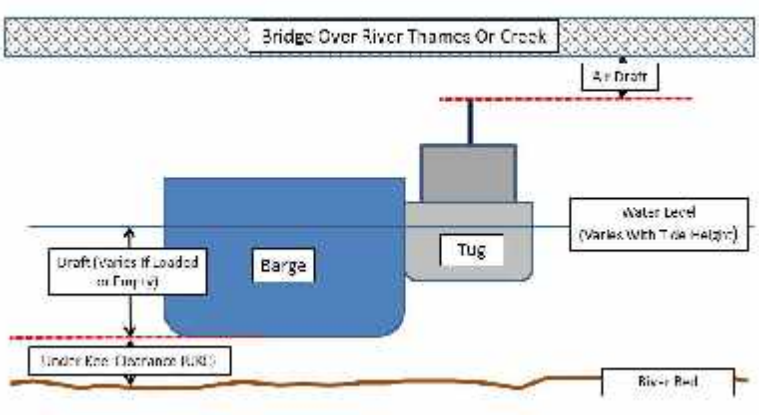


Figure 5.1: Criteria for Navigating in Tidal Waterways

5.3.4 These basics then have to be related and applied to the tidal regime on any particular day. The sketches below are based on tidal curves derived from the on-line Total Tides program published by the UK Hydrographic Office (UKHO). The tidal reference point is London Bridge and there would be very minor difference in timings but both the height and

duration of the tide will be very similar for Bow Creek and so can be used for this assessment.

5.3.5 The Figure 5.2 below is taken from an Admiralty Chart (published by UKHO) and, amongst other things shows the water depths relative to the chart datum (CD), which approximately equates to Lowest Astronomic Tide (LAT). To illustrate the importance of the "rise of tide" on navigation, five water depths have been highlighted.

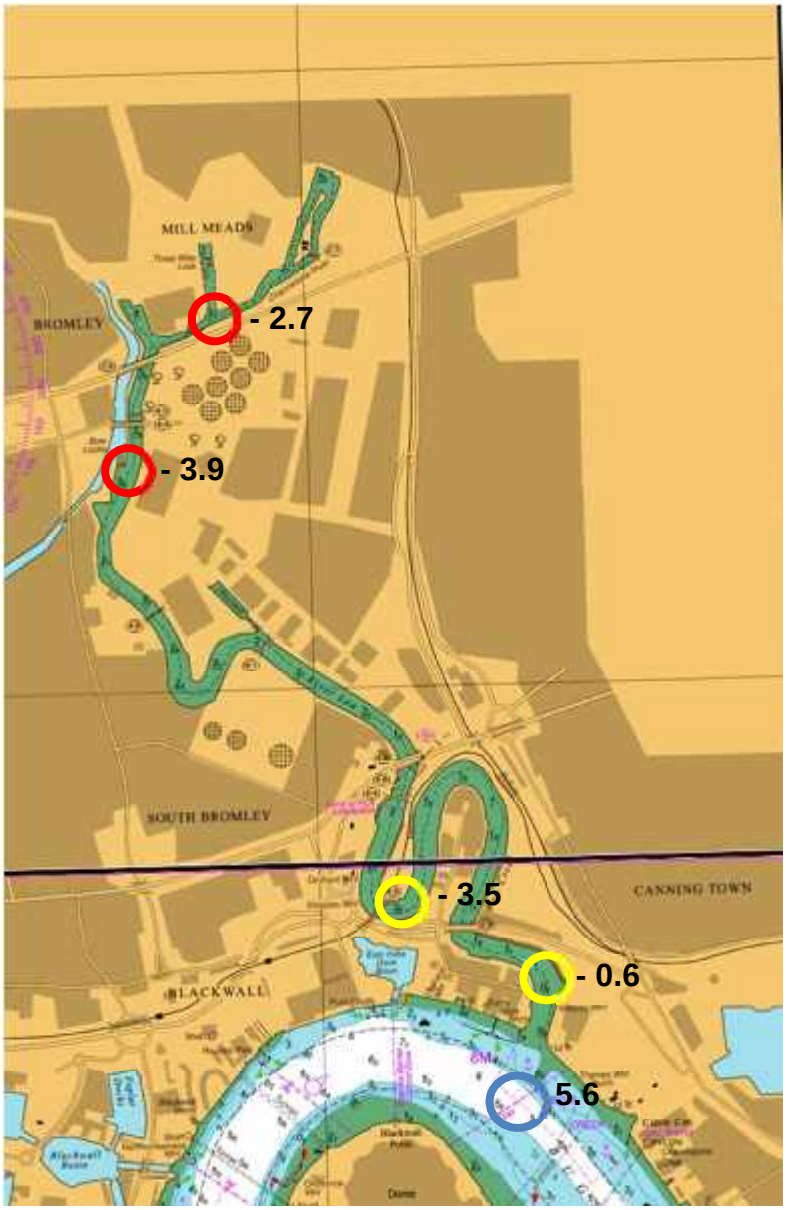


Figure 5.2: Extract of Admiralty Chart 3337 showing the Lee River

5.3.6 In **BLUE** (in the main River Thames), the water depth at CD is 5.6m, meaning that, when there is a "rise of tide" of (say) 4m, then that actual water depth is 5.6 + 4.0 = 9.6m

5.3.7 In **YELLOW** (part way along Bow Creek), the water depth at CD is minus 0.6m and 3.5m (this is known as a "drying height") and means that, when there is a "rise of tide" of (say) 4m, then the actual water depth is -0.6m + 4.0m = 3.4m or in the case of -3.5 + 4.0 = 0.5m

5.3.8 In **RED** (further inside Lee River), the water depth at CD is minus 3.9m and 2.7m and means that, when there is a "rise of tide" of (say) 4m, then the actual water depth is -3.9 + 4.0 = 0.1m or in the case of -2.7 + 4.0 = 1.3m

5.3.9 In order to move any vessel about a suitable UKC which does not fall below the minimum 10% draft, as recommended, must therefore be available at all times. If we take a barge of 350t capacity, then its draft when loaded is approx. 2.1m. We therefore have the following water depth requirements assuming that minimum 2.4m water depth is required. The required "rise of tide" along the five marked location as on the Figure 5.2 is summarised in Table 5.1.

	Natural Water Depth	Water Depth Required	Rise of Tide Required
In River Thames	5.6m	2.4m	Nil
In Bow Creek 1	-0.6m	2.4m	3.0m
In Bow Creek 2	-3.5m	2.4m	5.9m
In Lee River 1	-3.9m	2.4m	6.3m
In Lee River 2	-2.7m	2.4m	5.1m

Figure 5.1: Lee River Creek (assuming 350 tonne barges)

5.3.10 This means, with the River Lea in its current charted state, in order to navigate a 350t barge to/from the Abbey Mills PS site a "rise of tide" of 6.3m is required to enable an acceptable UKC to be achieved.

5.3.11 Examples of tidal curves as described earlier in section 5.3.4 are shown below with the first curve being for a randomly selected Spring Tide and the second for a randomly selected Neap Tide.

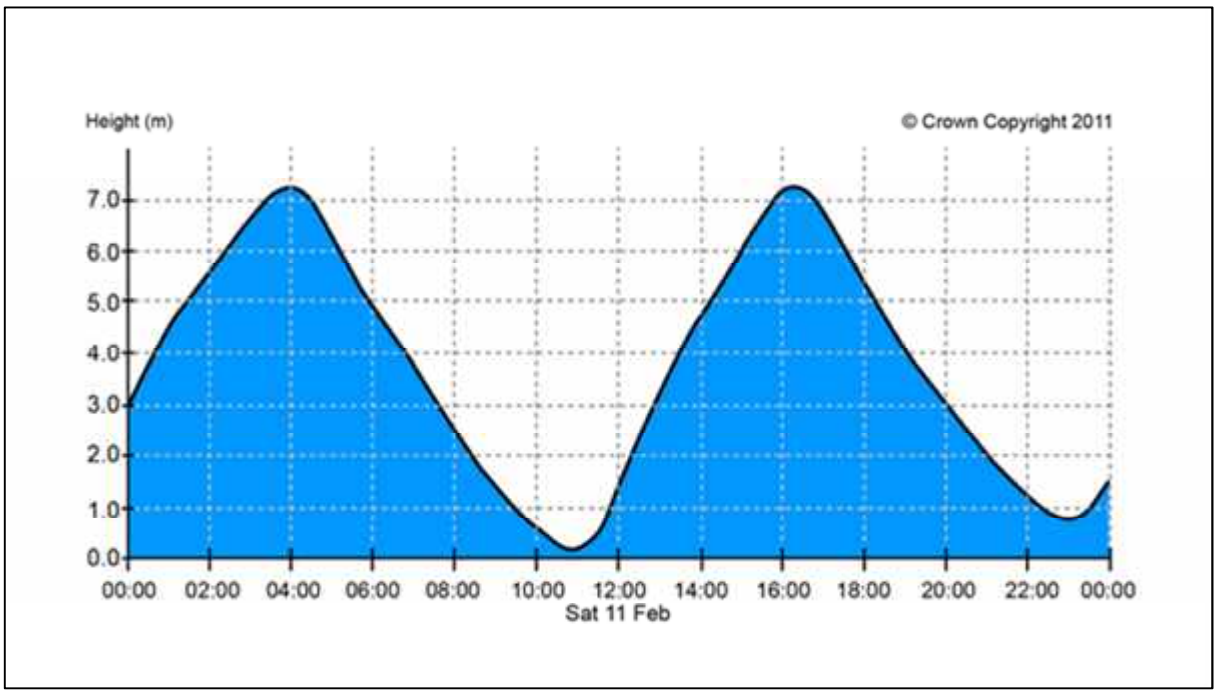


Figure 5.3: Spring Tide example tidal curve

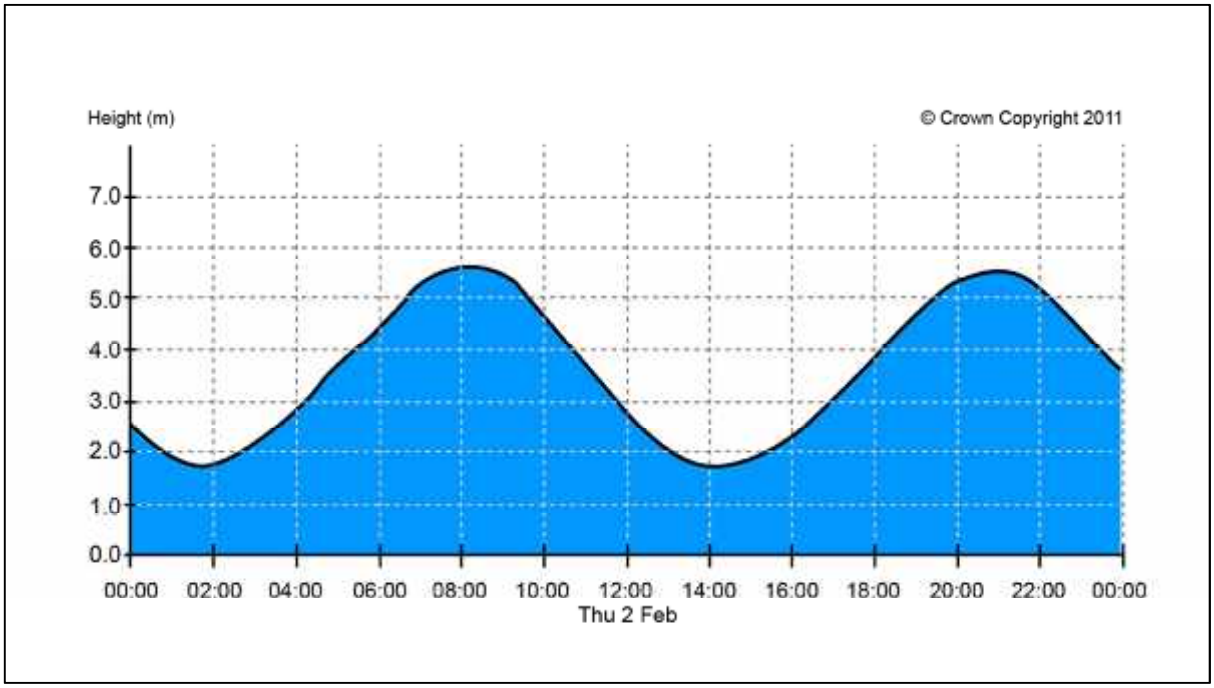


Figure 5.4: Neap Tide example tidal curve

5.3.12 As stated, to enable barges to navigate the length of the River Lea a "rise of tide" of 6.3m is required to access Abbey Mills PS site. When this is related to the Spring and Neap tidal curves illustrated on figures 5.3 and 5.4, it can be seen that during a Spring tide there is a reduced tidal "window" of approximately 2hrs accessibility for 350t barges. However, during a Neap tide, the maximum "rise of tide" is some 5.6m, hence below required "rise of tide" of 6.3m for 350t barges which makes the site totally inaccessible. This indicates that dredging of Bow Creek will need to be undertaken prior to any construction works (see section 6).

5.4 Feasibility of barges to/from the North of the site via Prescott Channel

5.4.1 In order to appraise every conceivable solution, we briefly considered whether spoil could be taken by river Northwards via the Prescott Channel and the Lee or Stort Navigation. It is noted that although these channels would allow such a length of vessel, draught limitations of 1.24m on the River Stort and 1.8m on the River Lee make this impossible, even without finding a suitable disposal site or transhipment location.

5.5 Constraints in Access for Barges under Bridges

5.5.1 The operational conditions may exist where barges are unable to pass through bridges due to there being insufficient water depths (typically large, fully loaded, barges transiting at low water) or insufficient bridge height clearance (typically large, empty, barges transiting at high water).

5.5.2 There are 11 bridges along Bow Creek and Lee River as listed in Table 5.2. The table summarise the clearance under the bridges for highest astronomic tide (HAT) and medium high water spring (MHWS). It is common approach to use MHSW for design purpose.

Bridge Name	Clearance (HAT)	Clearance (MHWS)
Lower Lea Crossing	8.8	9.4
Docklands Light Railway	8.5	9.1
Canning Town Old Railway	4.4	5.0
Dock Road Foot	5.6	6.2
Canning Town Road	4.6	5.2
Barge Dock Foot	9.1	9.7
Ailsa Wharf	4.8	5.4
Twelve Tree Road	4.4	5.0
Bow Lock Foot	4.5	5.1
District Line Rail	2.6	3.2
Hammersmith and City Rail	2.6	3.2

Table 5.2: Lee River Creek (assuming 350tonnes barges)

5.5.3 The accessible clearance for 350t barges was based on the following:

- The moulded depth is 4.3m,
- The unloaded draft is 2.1m,
- The unloaded draft is 1.5m,
- A required Air Draft is 1.0m,
- District Line Rail Datum is 10.3m,
- Hammersmith and City Rail Datum 10.3m.

5.5.4 Based on these assumptions to allow safe passage under a bridge, a minimum clearance of 3.8m is required.

5.5.5 It can be seen in the Table 5.2, that the required clearance can be met at most of the locations not only for MHWS but also for HAT. The exceptions are two bridges: the District Line Rail and the Hammersmith and City Rail, which have the lowest clearance of 3.2m at MHWS. As this is less than the required minimum, the maximum navigable MHWS of 6.5m is allowed to ensure accessibility under the bridge. This will further limit the accessibility to the Abbey Mills PS site during the Spring Tide.

5.6 Requirements for Handling

5.6.1 As shown previously the Bow Creek is tidally constrained providing only short periods of accessibility to the site per tide, ie twice daily. Because of this, and to take full advantage of the available tidal windows, the handling methodology of the spoil material will need to be very efficient.

5.6.2 For this exercise, and to employ the use of practises employed within Lee Tunnel and Crossrail projects, we shall assume a conveyor be used to transfer loads from the site to the barges. The employment of a tripper loader with adjustable slew and height has also been assumed to allow even loading of a barge during all tidal states and enable an assumed loading rate of 500 tonne per hour to be achieved.

6. PROPOSED STRATEGY

6.1 Requirement for dredging

6.1.1 From the information as described within the previous section, and in particular 5.3, it is clear that in order make the River Lee accessible during Neap Tide, dredging will be required. Using information form Admiralty Chart 3337 we have produced a cross section along Bow Creek and Lee River in order to assess the scale of this required dredging.

6.1.2 Referring to Tide Tables produced by the PLA for 2013 Mean High Water Neap at both North Woolwich and Tower Bridge is 5.9m thus with some confidence we can say that such a high tide will regularly be applicable for Bow Creek and River Lee.

6.1.3 Applying the 2.4m draft requirements of a 350t barge (as noted within section 5.3.9) anticipate the need for a usable tidal window of around 3 to 4 hrs to be created. Again examining the tidal curves a tide height of around 4.9m would enable this – hence the maximum bed level of Bow Creek/River Lee should be minus 2.5m.

6.1.4 Figure 6.1 overleaf shows the current bed profile plotted with an exaggerated scale with a line shown at 2.5m above Chart Datum to show clearly where dredging is required. From this simplistic diagram it is clear that a significant amount of dredging shall be required, with rough calculations producing a channel of such a bed level across 50% of the width totalling around 30,000m^3 of material.

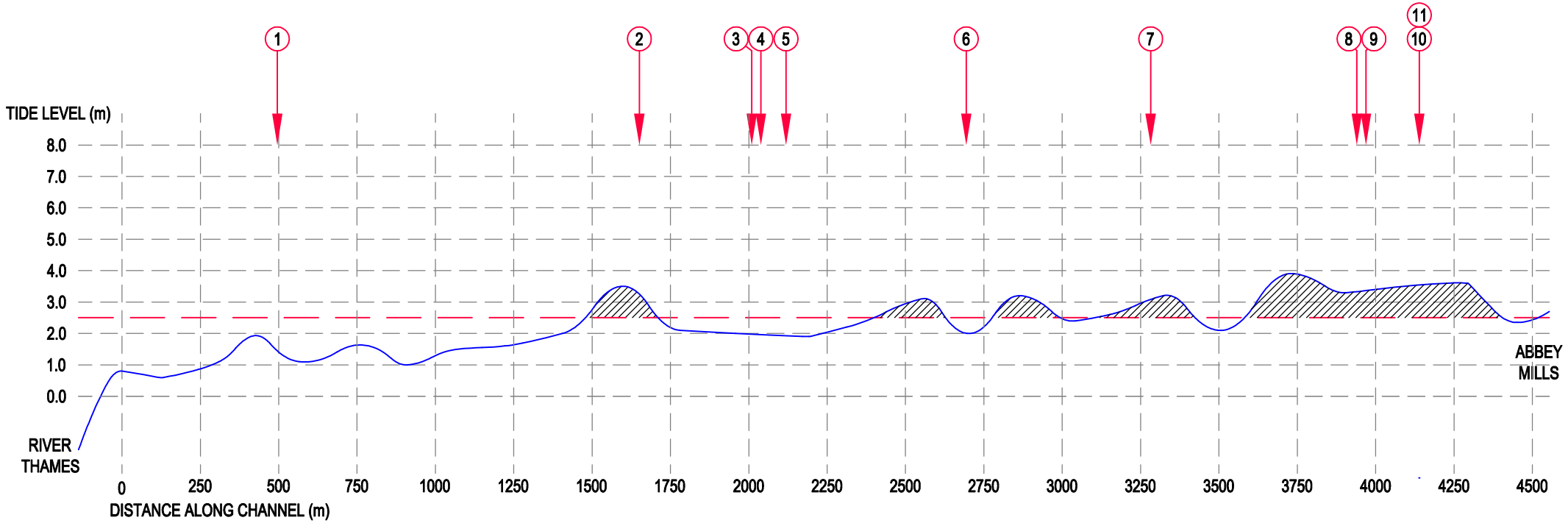
6.1.5 We understand that dredging will be subject to approval by various parties including the Environment Agency and the PLA and will require extensive structural survey checks to river walls and a significant environmental and ecological impact assessment. We would also note that any dredging would need to undertaken during the winter period from November to March.

6.1.6 Part of the consents process that the Thames Tideway Project (and, indeed, any project taking place on the Thames) must follow, is to obtain a River Works License (RWL) (relevant to construction, demolition or alteration) and a Dredging Licence from the Port of London Authority.

6.1.7 For this report, we have been unable to examine this aspect too closely but have assumed that it is reasonable to produce a bed profile as above which in fact may improve habitat and certainly navigation. It is also noted that the maximum depth of dredging is required to be 1.4m, which is not unreasonable – although it does have an associated high cost as shown later in section 7

6.2 Loading Barges

6.2.1 In order to maximise the use of the narrow tidal windows, barges will need to loaded whilst sitting aground, thus a suitable Safe Berth Not Always Afloat but Safely Aground (SBNAABSA) will need to be prepared and maintained. Cost construction of a Abbey Mills Pumping Station. Campsheds based on the assumption that 0.5m reinforced concrete and steel piles are intended to be employed for this (see Section 7 for size and approximate cost). It is noted that in any case the tonnage loaded whilst sitting aground should not exceed about 75% of the nominal barge capacity. The remaining 25% of any load would then be loaded as the barges become afloat on the rising tide.



KEY

DREDGING REQUIRED

STRUCTURE/CROSSING LOCATIONS

1. LOWER LEA CROSSING
2. DOCKLANDS LIGHT RAILWAY
3. CANNING TOWN OLD RAILWAY
4. DOCK ROAD FOOT
5. CANNING TOWN ROAD
6. BARGE DOCK FOOT
7. AILSA WHARF
8. TWELVE TREES ROAD
9. BOW LOCKS FOOT
10. DISTRICT LINE RAIL
11. HAMMERSMITH & CITY RAIL

APPENDIX B

FIGURE 6.1 - BOW CREEK EXISTING BED PROFILE

6.3 Bow Creek/River Lee use

6.3.1 Assuming that the dredging will be undertaken the site would be accessible by barges;

- Twice a day for approximately 3.5 hours during Neap Tide (Figure 6.2), and
- Four times a day of approximate 1.5 hour slots during Spring Tide (Figure 6.3). The interim period at each tide is caused by the site being inaccessible due to clearance under the London Underground bridges just south of the site (see section 5.5.3)

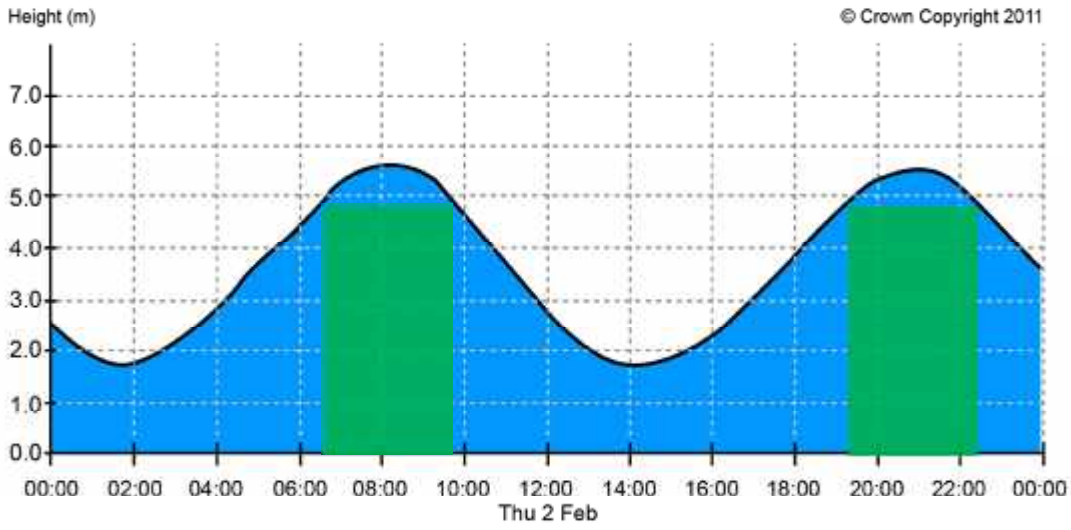


Figure 6.2: River Lee accessibility during Neap Tide

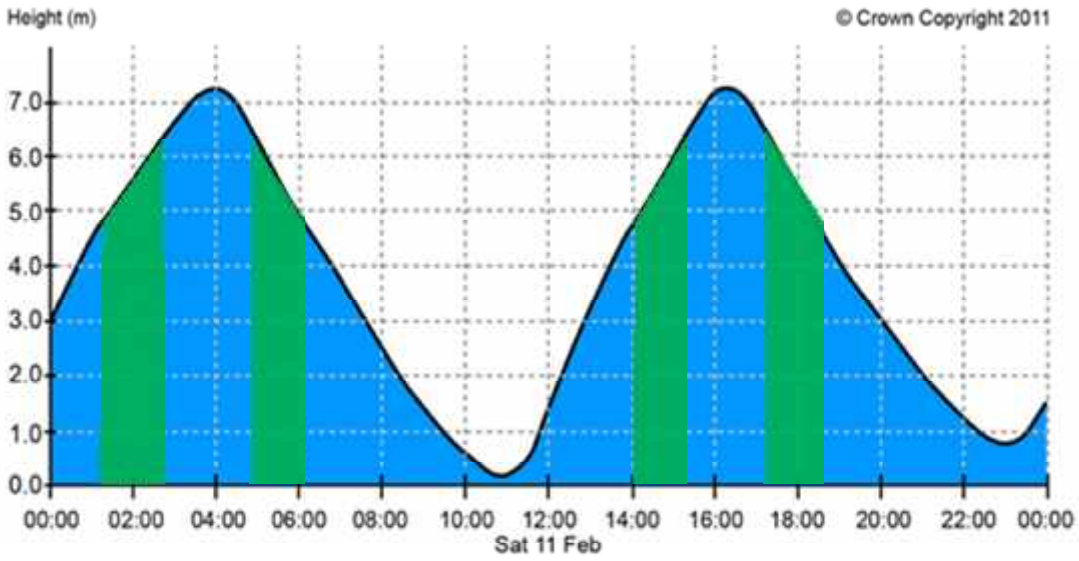


Figure 6.3: River Lee accessibility during Spring Tide

6.4 River Transport Strategy for Abbey Mills

6.4.1 Using the information gathered in the sections previously and applying the tidal accessibility windows achieved in Section 6.2 allows us to a workable strategy for barge use. It should be remembered that robust assessments have been utilised all the way through this appraisal which will allow a degree of flexibility to be created within the timings below.

6.4.2 A description of the necessary tug and barge processes/actions per tide cycle are listed below in Table 6.4.

		At the site	Along River Lee	
Status at start of tidal cycle		Two barges 75% loaded wait to be floated by tide	Mainstream tug and pulling 2 No. empty barges wait on River Thames at Bow Creek junction	
	Neap Tide			Spring Tide
Tidal Window	30 min	Two barges are filled to capacity	Mainstream tug and two barges travel from Bow Creek junction to Abbey Mills site.	30 min
	60 min	Mainsream tug moors barges in empty berths and picks up the two 350t barges from campshed.		60 min
	90 min	Shunt tug positions empty barges adjusent to wharf and over campshed	Mainstream tug tows two loaded barges from site to mooring point in River Thames	90 min
	90min	The site is not accessible due to the bridge clearance constrain during the Spring Tide, when "rise of tide" higher than 6.5m.		180 min
	120min	Two empty barges are filled to capacity	Mainstream tug picks up two empty 350t barges from mooring point	210min
	150min		Mainstream tug and two barges travel from Bow Creek junction to Abbey Mills site.	240min
	180 min	Mainstream tug moors barges in empty berths and picks ups the two 350t barges from camshed.		270 min
	210 min	Shunt tug positions empty barges adjacent to wharf and over campshed	Mainstream tug tows up two loaded 350t barges from the site to Bow Creek junction	300 min

Table 6.4: Indicative transport strategy for barges

6.4.3 This strategy shows that within each tidal window 4 x 350 tonne barges, disposing of 1400 tonnes of spoil, could be removed. As there are 2 tides per day, this would be equivalent to 2800 tonnes per day maximum.

7. INFRASTUCTURE ASSESSMENT

7.1 Required Infrastructure

7.1.1 The Abbey Mills Pumping Station will require improvements to the existing facilities and/or new infrastructure to be provided on the site in order to be used as a main drive site and facilitate the waterborne logistics. This includes the following:

- Upgraded wharf frontage,
- Campsheds - a level secure area under a barge mooring location for the barge to rest on at low tide periods, reducing the risk of uneven loading of the barge and the risk of suction under a loaded barge,
- Adaptation of a Slurry Treatment Plant to provide chalk cakes,
- Extension of Transhipment site
- Additional Tugs – one mainstream and one shunt,
- Dredging and maintenance to facilitate barge movements to loading location,
- Mooring aids such as fenders and dolphins,
- Navigational aids such as lights, signage and buoys.

7.2 Estimated Infrastructure costs

Item Description	Cost
Upgraded Wharf Frontage (70m length)	£220,000
Campshed (70m x 12m)	£180,000
Slurry Treatment Plant adaptation	£500,000
Transhipment extension	£5,000,000
Mainstream and shunt tugs	£1,800,000
Dredging of Bow Creek/River Lee (30,000m^3)	£4,500,000
Mooring Aids (fenders and Dolphins)	£250,000
Navigational Aids – eg lights signage and buoys	£350,000
Total	**£12,800,000**

7.3 Key Assumptions and Issues

7.3.1 Costs have been based upon recently gathered tender rates from similar schemes, SPONS and allow for a degree of inflation and contingency.

7.3.2 Identified infrastructure is for anticipated abnormals only ie those attributed as being additional to be able to relocate the eastern drive from Chambers Wharf to Abbey Mills.

7.3.3 It is recognised by the scheme promoter that a transhipment facility will need to be an integral part of the logistics chain for movement of materials by river. This is a facility that is therefore already required for excavated materials from Main drive sites at Carnwath Road and Kirtling Street. Currently the Eastern Drive from Chambers Wharf with its location downstream of Tower Bridge is anticipated to be serviced directly by sea faring ships ie no transhipment necessary. We estimate such a transhipment facility to cost in the region of £15m so have only included an uplift to account for the extra material it will have to handle.

7.3.4 The costs above do not take account of the need to train or recruit qualified crew and certified boatmasters as this is required by the scheme as a whole in order to deliver its DCO commitment on waterborne logistics.

8. CONCLUSIONS

8.1 Conclusions

8.1.1 The objective of the report was to determine whether Abbey Mills PS site can be used as a main drive site and whether it is feasible to use River Lea for transportation of materials.

8.1.2 It is noted that Abbey Mills PS was originally planned to be used as a main tunnel drive site at Phase 1 consultation stage, though was revised to a reception site during Phase 2. The main reason cited was the assessed difficulty in transporting materials using the Bow Creek/River Lea.

8.1.3 Based on the robust assumption that a tunnelling rate of 200m per week will be achieved equating to 4,400 tonnes of excavated material per day, the study main conclusions are as follows:

- Based on available information the current Abbey Mills PS site appears large enough to accommodate required facilitates to act as a main drive site
  - Slurry Treatment Plant 2,400m^2
  - Stockpile capacity of two days excavated material 4,000m^2
  - Storage capacity for over 2 days of tunnel segments 500m^2.
- The Bow Creek and River Lea is tidally constrained and can only be used for waterborne logistics ie spoil removal by barge, once extensive dredging is undertaken along sections of the River Lea prior to any construction works.
- Once an anticipated reasonable level of dredging has been undertaken it appears feasible that a waterborne logistics strategy could be created, so that during each Neap or Spring Tidal window 4 x 350 tonne barges could serve the site. This would equate to a maximum disposal rate of 2800 tonnes of spoil per day, equivalent to 63% of excavated material.
- The additional cost of infrastructure to enable river transport to serve the Abbey Mills PS site as a main drive site is estimated as being £12.8m.

8.1.4 The conclusions above are based on a robust assessment and it should be noted that a tunnelling scenario in which a rate of 126m per week is achieved would allow all excavated materials to be potentially disposed of using waterborne logistics. Although it is impossible to expect any major tunnelling scheme such as this to 'maintain' a rate, this figure exceeds the average rate of 90-100m per week currently assumed by the TTT scheme promoter.

APPENDIX A – DATA ON THAMES BARGES

BENNETT'S BARGES

Bennett's Barges company information

Bennett's Barges provides sustainable marine logistics solutions in London and the South East. Services include transporation of bulk materials, containers, plant, equipment, loose aggregates and waste for recycling and reprocessing.

About us

The Bennett's Barges operational team have a reputation for excellence having coordinated some of the South East's most technically complicated navigational contracts, whilst ensuring a consistently reliable service to many key long-term customers.

Photography

Centre
Steven B manoeuvring barges at Northumberland Wharf

Bottom left
Argonaut loading loose aggregate at the Isle of Grain

Bottom right
Operations at the Olympic Park East London

Area of operation

The City of London originally developed around the transport links of the River Thames and connected waterways. Today these waterways provide uncongested routes into and within the busy City allowing for sustainable transportation of bulk cargo; in one year alone Bennett's Barges saved 6 million lorry miles.

Standards

All craft operatives are appropriately qualified as required by the relevant licensing authorities. All vessels are operated within the Port of London Marine Safety Code.

History

Founded in 1983 Alan C Bennett's & Sons developed through towing and attendance contracts in the dredging and marine civil engineering sectors. Following a series of aggregate and spoil disposal projects, including The Limehouse Link and the Jubilee Line Underground Railway Extension, a link was made with Foster Yeoman Limited, now part of Aggregate Industries.

After a highly successful spell as the lighterage contractor for Yeoman Aggregates, we became part of the group in 2002. Foster Yeoman became a member of Aggregate Industries in 2006 and we completed the group customer package of sustainable transport options.

In 2009 we merged with Tidy Thames Refuse Services to form a joint venture, gaining a new Managing Director, Mr Chris Livett – Waterman to H.M. The Queen. The merger brings a broader client base and additional specialist barges and vessels. We now cater for the domestic, leisure, construction, waste and commercial sectors.

Bennett's Barges
Address: Eagle Wharf, 53 Lafone Street, London, SE1 2LX
Telephone: 020 7407 9991
Facsimile: 020 7378 1359
Email: admin@bennettsbarges.com
Web: www.bennettsbarges.com

UK standard TOWCON & BARECON conditions apply

AGGREGATE INDUSTRIES

BENNETT'S BARGES

Tug & Barge Register plant specification

Olympic Barges	Length Overall	Breadth	Container Capacity	Loaded Draught	Hold Length	Hold Width	Moulded Depth	Hold Cubic Capacity	Carrying Capacity
Patricia Brent	25.76m	7.29m	3	1.20m	18.48m	2.85m	2.85m	110 cubic m	100 tonnes
Ursula Katherine	28.65m	7.29m	9	1.90m	24.60m	6.36m	6.36m	450 cubic m	250 tonnes
Tidy Thames II	21.97m	3.85m	N/A	1.30m	13.42m	2.54m		54 cubic m	70 tonnes
Tidy Thames III	26.20m	5.16m	3	1.68m	19.36m	3.75m		167 cubic m	100 tonnes
Tidy Thames IV	26.30m	5.50m	3	1.72m	20.12m	4.10m		185 cubic m	150 tonnes
Tidy Thames V	24.00m	5.22m	3	1.70m	18.00m	4.10m		160 cubic m	130 tonnes
Container Barges									
Corrine	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Chrisline	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Carol	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Debra	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Delia	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Gaynor	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Jean	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Joyce	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Laura Lyn	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes
Selina	28.65m	7.29m	18	2.1m	24.60m	6.36m	4.3m	650 cubic m	350 tonnes

Aggregate Barges	Length Overall	Breadth	Moulded Depth	Loaded Draught	Hold Length	Hold Width	Hold Cubic Capacity	Carrying Capacity
Alan Bennett	76.50m	10.96m	4.5m	3.10m	66m	9.0m	2500 cubic m	1740 tonnes
Gordon Bennett	71.03m	10.43m	3.5m	3.10m	66m	9.0m	2000 cubic m	1250 tonnes
Our Daniel	38.25m	11.00m	5.9m	3.27m	34m	9.5m	1615 cubic m	1000 tonnes
Our Duncan	38.25m	11.00m	5.9m	3.27m	34m	9.5m	1615 cubic m	1000 tonnes
Our Dominic	38.25m	11.00m	5.9m	3.27m	34m	9.5m	1615 cubic m	1000 tonnes
Our Frankie	71.03m	10.43m	3.5m	3.10m	66m	9.0m	2000 cubic m	1250 tonnes

Push/Pull Tugs	Length Overall	Breadth	Moulded Depth	Loaded Draught	Horse Power	Bollard Pull
Argonaut	24.50m	6.60m	3.6m	2.59m	1,000hp	12T
Steven B	23.37m	5.70m	2.2m	2.20m	1,250hp	12T
Sea Challenge II	22.79m	7.10m	3.6m	3.20m	1,000hp	15T
Tidy Thames I	28.35m	5.77m	3.6m	1.30m	(Specialised multi-purpose self propelled barge)	

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UK standard TOWCON & BARECON conditions apply

AGGREGATE INDUSTRIES

BENNETT'S BARGES

Aggregate Barges plant specification

The ultimate sustainable transportation solution, Bennett's Barges has a fleet of 6 bulk cargo/aggregate barges.

Ranging in capacity upto 1740 tonnes the advantages of transporting materials in these bulk carg carriers is huge compared to road transportation.

Our largest barge can carry approximately over 60 lorry loads; the scale of environmental, traffic congestion and financial savings is therefore plain to see.

Photography

Centre
Sea Challenge II pushing Gordon Bennett at the top of Erith Reach

Bottom left
Navigating Our Daniel through the Thames Barrier

Bottom right
Loading aggregate at the Isle of Grain

Aggregate Barges	Length Overall	Breadth	Moulded Depth	Loaded Draught	Hold Length	Hold Width	Hold Cubic Capacity	Carrying Capacity
Alan Bennett	76.50m	10.96m	4.50m	3.10m	66m	9.00m	2500 cubic m	1740 tonnes
Gordon Bennett	71.03m	10.43m	3.50m	3.10m	66m	9.00m	2000 cubic m	1250 tonnes
Our Daniel	38.25m	11.00m	5.90m	3.27m	34m	9.50m	1615 cubic m	1000 tonnes
Our Duncan	38.25m	11.00m	5.90m	3.27m	34m	9.50m	1615 cubic m	1000 tonnes
Our Dominic	38.25m	11.00m	5.90m	3.27m	34m	9.50m	1615 cubic m	1000 tonnes
Our Frankie	71.03m	10.43m	3.50m	3.10m	66m	9.00m	2000 cubic m	1250 tonnes

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UK standard TOWCON & BARECON conditions apply

AGGREGATE INDUSTRIES

A member of the Hanson Group

Appendix 5 Noise Assessment