

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Sustainability Statement

Doc Ref: **7.07**

Appendix B.3

Barn Elms

APFP Regulations 2009: Regulation **5(2)(q)**

Hard copy available in

Box **48** Folder **B**
January 2013

**Thames
Tideway Tunnel**



Creating a cleaner, healthier River Thames

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Appendix B: Site-specific appraisal

B.3 Barn Elms

Type of site:	CSO site, short connection tunnel drive site
Description of proposals:	The site is located within the London Borough of Richmond upon Thames and comprises land within a school's sport centre, a playing field and a small area of a roadway. The site would be used to intercept the West Putney Storm relief and as a connection tunnel drive site.
<p>Water quality</p> <p>Maintain and enhance river water quality</p>	
<p>Appraisal</p> <p>The proposals would support the objective. Particular issues of relevance to the site appraisal include:</p> <ul style="list-style-type: none"> • The site does not lie within a source protection zone. The shaft would go through the upper aquifer but due to the ground conditions (clay) there would be no need for de-watering, nor is there concern that contamination may be mobilised. Construction of the shaft would consequently not lead to deterioration of river water quality. • Pollutant runoff would be mitigated through appropriate site drainage as outlined in the <i>CoCP</i>, preventing the discharge of pollutants via combined or surface water drains as part of the surface water discharge from the construction site. • Once operational the interception of overflow discharge at West Putney Storm relief would lead to a reduction of spill frequency from 30 to 1 time per year. The yearly discharge volume would be reduced from approximately 37,000m³ to 1,500m³ consequently leading to a reduction in sewage derived litter from 9t to less than 1t. The proposals would enhance water quality in operation. <p>In summary, river water quality would be maintained during construction. Interception of the CSO would enhance water quality in the operational phase.</p> <p>Further details can be found in the <i>Environmental Statement</i> and the <i>CoCP</i>.</p>	
<p>Biodiversity</p> <p>Maintain and enhance biodiversity</p>	
<p>Appraisal</p> <p>The proposals would support the objective. Particular issues of relevance to the site appraisal include:</p> <ul style="list-style-type: none"> • Two small trees and amenity grassland would be removed from the site during construction. These effects would be temporary as reinstatement would take place once construction works have ended. Trees would be replaced and natural 	

grassland of higher habitat importance seeded. Habitat diversity would not be reduced during construction.

- During construction lighting principles outlined in the *CoCP* would ensure that notable species would not be disturbed in their natural behaviour. Bird nesting and bat boxes would be provided in operation. Brown roofs would be installed on the combined kiosk and ventilation column structure and would provide further habitat enhancement. The objective would be met by the proposals as terrestrial biodiversity would be maintained during construction enhanced in operation.
- The site is not directly adjacent to the water course and no effects would occur on aquatic biodiversity during the construction.
- During the operational phase there would be positive effects on aquatic biodiversity due to the reduced amount of sewage and sewage derived litter entering the ecosystem. This reduction would lead to an improvement in dissolved oxygen concentrations and reduce the level of sediment nutrient levels, consequently improving the quality of habitats and enhancing biodiversity.

In summary, the proposals would maintain aquatic and terrestrial biodiversity during operation and enhance both of these during operation.

Further details can be found in *the Environmental Statement, Design Principles* and the *CoCP*.

Climate change mitigation

Maximise energy efficiency and minimise the carbon footprint of the project

Appraisal

This objective is most appropriately appraised at the project level, as opposed to the site level. This is because whilst there are variations in energy and CO₂ emissions between sites, in general, these are representative of the different types of site proposed (eg, drive site, CSO interception). The individual sites do not provide an appropriate measure of how far this sustainability objective has been achieved. This is detailed within the *Energy and Carbon Footprint report*.

Procedures to maximise energy efficiency and minimise the carbon footprint of the scheme would be implemented through project-wide initiatives, and not specifically at the site level. Energy Management Plans would be implemented through the *CoCP*, which, alongside Thames Water's proposals to account for carbon emissions throughout the construction process, would assist in the management of emissions arising from the sites.

Energy and emissions are discussed in the thematic appraisal within the climate change mitigation section (see Appendix A). Additional details are also provided within the *Energy and Carbon Footprint report*.

Whilst predominantly addressed at the project-wide level, at the site level it is anticipated that the proposals would broadly support the objective. The following broad issues are anticipated to arise at the site:

- Greenhouse gas emissions resulting from construction materials at the site would be approximately 3,000t CO₂e. During the construction phase approximately 150t CO₂e and 950t CO₂e would result from logistics and construction (TBM, plant and machinery operation, lighting and welfare facilities) respectively.
- Lighting during operation would be restricted to a low level light at the kiosk door.

The light would be activated to a motion control switch which would be linked to the door opening.

- During operation the site would make use of passive ventilation. Consequently it would support the objective by minimising the energy requirements for venting and maximising the efficiency of ventilation points.

In summary, the proposals would support the objective during operation as energy requirements for lighting and venting would be minimised.

Further details can be found in the *Environmental Statement* and the *Energy and Carbon Footprint Report*.

Change adaptation and flood risk

Maximise resilience and adaptability to change;

Take account of flood risk in the design of sites

Appraisal

The objective on resilience and adaptability to climate is predominantly considered at a project-wide level due to relevant changes in population and climate occurring at regional level rather than specifically at a site level (see Appendix A).

However, at the site level, the proposals would support the objectives to maximise resilience and adaptability to change, and take account of flood risk in design. Particular issues of relevance to the site appraisal include:

- The site is at high risk from tidal and fluvial flooding from the River Thames and from fluvial flooding from Beverly Brook. Flood defences along the banks of the River Thames would be maintained and monitored. There would be no increased flood risk resulting from the development. Further, an emergency plan would be in place.
- The flood risk from groundwater and sewers would remain unchanged (low) throughout the development. Appropriate site drainage in accordance with the CoCP would ensure that the risk of surface water flooding would not be increased.
- Permeable surfacing would be incorporated into hard standing and access road to help manage surface water runoff. This would further be supported by installation of brown roofs on the electrical kiosk and ventilation column building maximising resilience and adaptability in operation.
- There would be an increase in hard standing due to the construction of an access road. However, the site is not located within the Central Activity Zone and the increase would be minor. In addition the site is located next to the River Thames, meaning that the risk of urban heat is reduced. The proposals would therefore support the objective of maximising resilience and adaptability to change.

In summary, the proposals have taken flood risk into account so that there would be no increased risk of flooding from any source resulting from the proposals. Resilience and adaptability to change would be supported through the use of permeable hard standing and installation of brown roofs for surface water attenuation. As the site is located adjacent to the river resilience to increasing temperatures would be given.

Further details can be found in *the Environmental Statement, Site Selection Report* and *CoCP*.

Excavated materials and waste management

Minimise waste arisings and its impacts on the environment and communities and to promote re-use, recovery, recycling and beneficial use

Appraisal

The proposals would support the objective of minimising waste arisings. Particular issues of relevance to the site appraisal include:

- A shaft with an approximate internal diameter of 6m and a depth of 34m would be excavated and a connection tunnel constructed to join the shaft to the main tunnel. This would lead to an estimated 13,000t of excavated material, with 410t of site strip, 1400t of made ground, 5500t of imported fill and 5700t of London Clay. The materials would be managed in accordance with the *Excavated material and waste strategy* (see *Environmental Statement Vol 3 Appendix A*) that seeks to maximise beneficial re-use of material.
- An estimated 540t of construction waste would be generated, which would be managed through measures set out in the *CoCP*, including the application of a site waste management plan to maximise re-use, recovery and recycling in accordance with the waste hierarchy.
- Approximately 8t of welfare waste would be produced by staff per year during construction. This would be managed through measures set out in the *CoCP* including the site waste management plan to maximise re-use, recovery and recycling. Waste management at the site would consequently support the objective.
- The removal of trees from the site would generate vegetative waste which would be diverted from landfill unless the material would include invasive plants.
- There is a high risk of asbestos in the existing facilities to be demolished. Waste containing asbestos would be dealt with appropriately and according to relevant regulations, ensuring that there would be no impacts on environment and communities.
- Operational waste at the site is considered to be minimal, resulting from routine maintenance and would not affect the objective.

In summary, the proposals would divert a large amount of waste from landfill through re-use, recovery, recycling and beneficial use. Structures with potential of containing asbestos would be removed appropriately to ensure that the community and environment would not be impacted through the process.

Further details can be found in the *Environmental Statement, Excavated material and waste strategy* (see *Environmental Statement Vol 3 Appendix A*) and *CoCP*.

Resources and raw materials

Promote the sustainable use of resources

Appraisal

The objective to promote the sustainable use of resources is most appropriately appraised as a project-wide issue, rather than specifically at the site level. Whilst it will be important to work towards the objective through ongoing considerations towards the further design of sites, the major opportunities will arise by taking interventions across the project as a whole.

A significant volume of materials would be required to support construction. The material

specification required are central to the durability of the tunnel and therefore the scope for promoting the sustainable use of resources is limited by engineering requirements. A range of measures are proposed at the project level which support the objective and which would assist to promote the sustainable use of resources. Further details are available within the resources and raw materials section (Appendix A).

The following broad considerations are relevant to the sustainability at the site level:

- It is estimated that 25,000L of water would be used every 24 hours during the peak construction period on 2018. This is largely accounted for by 15,000L/d for shaft and tunnel grout/concrete and by 8,000L/d for mitigation measures such as washdown and dust suppression. The water requirements are within the available water for London, as estimated in Thames Water's Resource Management Plan. Consequently, water resources would be sustainably sourced.
- The operation of the site is not anticipated to present a large demand for materials, with the exception of those required in routine maintenance.

In summary, the proposals would make use of sustainable supplies of water during construction and would not require materials during operation. Consequently, the objectives would be supported by the proposals.

Further information can be found in the *Environmental Statement* and the *CoCP*.

Population, human health and equality

Ensure health and safety, and support the well-being of communities in which the project operates;

Encourage equality and sustainable communities

Appraisal

The proposals would support the objectives. However, significant negative effects relating to noise cannot be mitigated. The proposals would encourage equality and sustainable communities. Particular issues of relevance to the site appraisal include:

- The construction is estimated to last 2.5 years and standard working hours would be in place. Continuous working hours would be required during the construction of the connection tunnel which would last approximately 4 months. The *CoCP* sets out measures to ensure health and safety and support well-being within the community.
- Measures set out in the *CoCP* seek to minimise noise and vibration. However, there would be significant adverse effects relating to noise at one of the surrounding receptors during construction, which could not be further mitigated on site. Measures such as secondary glazing and compensation would be in place to off-set these effects where applicable. Whilst this would ensure health and safety, it is possible that the well-being of some receptors would be affected.
- The site is located within the London Borough of Richmond upon Thames AQMA. Mitigation measures would be in place to ensure that safety and health would not be compromised by the development and that the well-being within the community would be supported.
- Once operational, interception of the CSO would reduce the number of days that recreational river users would be exposed to pathogens from 120 to 4 days per year, consequently being beneficial to health and safety of river users.
- The site comprises land within the Barn Elms School Sports Centre which would be temporarily lost as public realm during the construction period. Once construction has been completed the open space would be available for public use. Only a small

part of the area would be affected and public access restored during operation, therefore, the proposals would have limited bearing on the objective.

- Changing rooms on site would have to be demolished and track and field facilities removed. The changing rooms would be replaced with new facilities and track and field facilities re-established on the grounds of Barn Elms School Sports Centre. These changes would be beneficial to health and safety of the community as the building is considered to be at high risk of asbestos would be removed and replaced.
- Encouraging equality and sustainable communities is predominantly addressed at the project wide level. However, extensive public consultation has been undertaken to take into account the community's views on the proposals at the site. This has been considered in conjunction with engineering, environmental, planning and cost issues to achieve a balance between vying interests. Consequently, it is considered that the proposals support the objective of equality and sustainable communities.

In summary, the proposals would support the objective by ensuring that health and safety would not be comprised through air quality and noise and vibration effects from the construction. However, it must be noted that one of the local receptors would experience significant noise effects during construction, which could only be avoided through compensation so that well-being may be affected. Loss of amenity space would be at a small scale and temporary. The changing room facilities, which are at a high risk of containing asbestos would be demolished and replaced, whilst exposure of recreational users of the river to pathogens would be reduced. Consequently, the proposals would support the objective.

Further details can be found in the *Environmental Statement* and the *CoCP*.

Economy

Promote a strong and stable economy

Appraisal

The proposals would support the objective. Particular issues relevant to the site appraisal include:

- A maximum of 40 workers would be employed at any one time during construction. This would support the objective by creating employment opportunities.

Further details can be found in the *Environmental Statement*.

Environmental protection and enhancement:

Minimise significant adverse environmental effects relating to air quality, noise & vibration and lighting from construction and operation of the Thames Tideway Tunnel;

Protect and enhance the character of landscapes and townscapes;

Protect and conserve the historic environment.

Appraisal

The proposals would support the objective of minimising adverse environmental effects. The objectives relating to landscape and townscape and historic environment would be supported. Particular issues relevant to the site appraisal include:

Environmental Effects

- The *CoCP* outlines stringent measures that would limit adverse environmental effects relating to air quality, vibration and lighting.

- However, one of the local receptors would be affected by significant adverse effects relating to noise during construction. All practical on site mitigation measures have been incorporated into the design of the site. Measures such as secondary glazing and compensation would therefore be provided to off-set these effects where applicable. The proposals have minimised significant adverse environmental effects where possible and as such would support the objective, albeit some impacts would remain.

Landscape and Townscape

- The character of the site and the surrounding area would be temporarily altered through removal of trees, green space and installation of construction facilities. Presence of construction activity and equipment would temporarily alter the townscape. The proposals would therefore not support the objective during construction.
- Replacement of trees and reinstatement of the site after construction would protect the current character of the site. Permanent structures (kiosk and ventilation column) would remain on site after the construction has been completed. These structures would be carefully designed to suit the character of the site. However, some permanent changes would remain.
- The surrounding townscape and views would not be affected through the permanent structures. Therefore the proposals would support the objective on a larger scale, albeit some small changes at the site would remain.

Historic Environment

- No nationally designated assets are located on site. However, the site lies partly within the locally designated Barnes Common Archaeological Priority Area and bears potential for buried assets. Archaeological investigations and watching brief techniques prior and during construction would achieve preservation of buried assets by record.
- Upstanding remnants of first sewage works, including machinery, may need to be removed for the construction. Photographic recording would ensure conservation.
- A tree dating back to the mid-18th century is located nearby the site. Protection measures are included in the *CoCP* to protect this asset.

In summary, the proposals seek to minimise adverse environmental effects, however, significant adverse effects relating to noise during construction, could not be further mitigated. The character of site and the surrounding area would be affected during construction. Permanent structures would permanently alter the character of the site but not of the surrounding townscape. Buried and above ground historic assets would be conserved by record and the mid-18th century tree in the proximity of the site would be protected through measures set out in the *CoCP*.

Further details can be found in the *Environmental Statement* and the *CoCP*.

Land use

Efficient and sustainable use of land and buildings

Appraisal

The proposals would not fully support the objectives. Particular issues of relevance to the site appraisal include:

- The site is located on an area of open green space. A permanent access road would

be built and would lead to an increase in hard standing. However, a change in function, from main tunnel drive site to short connection tunnel drive site, throughout the consultation and site selection process has allowed the size of the site to be minimised. The proposals would make efficient use of land, albeit on greenfield and would therefore not fully support the proposals.

- Barns Elms Sports Centre changing facilities would need to be demolished and rebuilt. It must be noted, however, that the changing facilities are at high risk of containing asbestos and that its removal would overall be profitable.

In summary, the proposals would not support the objectives as they require development on greenfield.

Further details can be found in the *Environmental Statement* and the *Site Selection Report*.

Sustainable transport

Minimise the detrimental impacts associated with the transport of construction materials and waste on communities and the environment, by prioritising the use of sustainable transport

Appraisal

The proposals would not support the objectives. Particular issues of relevance to the site appraisal include:

- As there are no river services in proximity of the site it would not be practicable to transport materials through use of river transport. Routes would be chosen to minimise effects on the community due to denser traffic which would consequently support the objective.
- There would be approximately 44 HGV movements per day during the peak construction period which would last 1 month. It is estimated that 12 HGV movements would be required on average during the construction period. Measures set out in the *CoCP* such as provision of a traffic management plan would ensure that detrimental impacts arising from construction traffic would be minimised.
- The PTAL for the site has been classified as 1 to 2, indicating a poor level of accessibility via public transport. However, parking space on site would not be available and is restricted in the surrounding area. It has been estimated that workers would not travel to site via car. Measures in the *CoCP* support sustainable transport for workers, therefore supporting the objectives.
- The objective refers to impacts associated with transport during construction and is therefore not applicable during operation.

In summary, the proposals would not support the objective of minimising detrimental impacts associated with transport. Materials would have to be transported to and away from the site by HGV. No workers are expected to travel by car to the site.

Further details can be found in the *Environmental Statement*.

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Thames Water Utilities Limited

Clearwater Court, Vastern Road, Reading RG1 8DB

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