

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Sustainability Statement

Doc Ref: **7.07**

Appendix B.21

Greenwich Pumping Station

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.21 Greenwich Pumping Station

Type of site:	CSO site, long connection tunnel drive site
Description of proposals:	The site is situated west of Norman Road and north of Greenwich High Road including Phoenix Wharf to the north of the railway viaduct in the London Borough of Greenwich. The site would intercept and divert flow from the Greenwich Pumping Station CSO and drive the Greenwich connection tunnel to Chambers Wharf.
<p>Water quality Maintain and enhance river water quality</p>	
<p>Appraisal The proposals would support the objective. Particular issues of relevance to the site appraisal include:</p> <ul style="list-style-type: none"> • The site lies within a source protection zone. The shaft would pass through the upper aquifer into the lower aquifer. Groundwater contamination has been identified at the site and dewatering would be required. Suspended solid settlement and further treatment as set out in the <i>CoCP</i> where required would ensure that contaminants are removed from effluent before discharge into the tidal Thames. • River water quality could be affected through surface water runoff and exposure of the drainage system to contaminants. Control measures outlined in the <i>CoCP</i> would ensure that these effects would be mitigated and that river water quality is maintained. • No in-river works are proposed at the site, therefore, river water quality would be maintained. • Once operational the interception of the Greenwich Pumping Station CSO would lead to a reduction in the spill frequency from 51 times to 4 times per year. The yearly discharge volume would be reduced from 8,320,000m³ to 573,000m³ and would lead to a reduction sewage derived litter from 2,100t to 315t. River water quality would consequently be enhanced. <p>In summary, surface water quality would be maintained during construction and enhanced during operation, therefore the proposals would support the objective.</p> <p>Further details can be found in the <i>Environmental Statement</i> and the <i>CoCP</i>.</p>	
<p>Biodiversity Maintain and enhance biodiversity</p>	
<p>Appraisal The proposals would support the objective. Particular issues of relevance to the site</p>	

appraisal include:

- The site comprises hard standing, amenity grassland, scattered trees, and introduced shrub planting and tall ruderal vegetation. The site would have to be cleared for construction. This temporary loss of habitat would however not affect bat or bird populations and habitat would be reinstated after the construction. Terrestrial biodiversity would be maintained throughout the development.
- There would be no in-river activity during construction so that aquatic ecology would not be affected.
- Once operational there would be positive effects on aquatic biodiversity due to the reduced amount of sewage and sewage derived litter entering the ecosystem. Improved dissolved oxygen levels and sediment nutrient levels would improve habitat quality and consequently enhance species diversity. Enhanced habitat would be particularly beneficial to fish and invertebrate populations.

In summary, terrestrial biodiversity would be maintained. The proposals would have limited bearing on the objective during construction as no in-river works are proposed.

Further details can be found in the *Environmental Statement* 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 will be implemented through project-wide initiatives, and not specifically at the site level. Energy Management Plans will be implemented through the *CoCP*, which, alongside Thames Water's proposals to account for carbon emissions throughout the construction process, will 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 issues are anticipated to arise at the site:

- Greenhouse gas emissions resulting from construction materials at the site would be approximately 41,000t CO₂e. During the construction phase approximately 2,000t CO₂e and 10,000t CO₂e would result from logistics and construction (TBM, plant and machinery operation, lighting and welfare facilities) respectively.
- Low level lighting at the steps to the shaft would be provided for maintenance in operation minimising energy requirements.
- The site would make use of passive ventilation in operation. Energy requirements for venting would be minimised and efficiency of ventilations points maximised.

In summary, the proposals would support the objective as they minimise energy requirements and maximise energy efficiency.

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 objective to maximise resilience and adaptability to climate changes, and take account of flood risk in design.

Particular issues of relevance to the site appraisal include:

- The site is at tidal flood risk from the tidal Thames and at fluvial flood risk from the tidal Thames and Deptford Creek. Existing flood defenses would be maintained, monitored and repaired if required.
- Risk from surface water flooding would not be increased. Surface water would be discharged into the Creek.
- The risks posed from groundwater flooding are low. Internal dewatering would ensure that the flood risk remains unchanged. Further, monitoring is proposed during construction and operation.
- Existing sewers would be maintained during construction. Flows currently being pumped to the Greenwich Pumping Station would be diverted to the main tunnel during operation. Consequently, there would be no increase of sewer flood risk.
- The site is not situated within the Central Activity Zone or within an area deficient of open space and there would be in increase in hard standing. This would maximise adaptability and resilience to future temperature changes as the risk of urban heat would be alleviated.

In summary, the proposals have taken flood risk into account in order to ensure that flood risk from any source would not be increased.

Further details can be found in the *Environmental Statement*, the *Site Selection Report* and the *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 by minimising the amount of waste arising. However, would not minimise impacts on the environment and communities resulting from waste. Particular issues of relevance for the site appraisal include:

- A shaft with an internal diameter of 17m and a depth of 46m would be excavated. In addition the site would serve as a long connection tunnel drive site. This would lead to an estimated 317,000t of excavated material, mainly consisting of chalk (288,000t). The material would be managed in accordance with the *Excavated material and waste strategy* (see *Environmental Statement Vol 3 Appendix A3*).

- A total of approximately 1,600t of construction waste would arise. Approximately 58t of welfare waste would arise per year. This would be managed through measures set out in the *CoCP*, including application of a site waste management plan to maximise re-use, recovery, recycling and beneficial use in accordance with the waste hierarchy.
- Operational waste would result from maintenance of the air management unit and would be negligible. The objective would therefore not be affected.

In summary, the proposals would support the objective as they promote re-use, recovery, recycling and beneficial use through measures set out in the *CoCP* and the *Excavated material and waste strategy* (see *Environmental Statement Vol 3 Appendix A3*).

Further details can be found in the *Environmental Statement*, the *Excavated material and waste strategy* (see *Environmental Statement Vol 3 Appendix A3*) and the *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 will assist to promote the sustainable use of resources. Further details are available within the resources and raw materials section (Appendix A).

Whilst largely addressed at the project-wide level, at the site level, the proposals would support the objective. The following considerations are relevant to the sustainability at the site level:

- It is estimated that 50,000L of water would be used every 24 hours during the peak construction period between 2017-2020. This is largely accounted for by water required for shaft and tunnel grout/concrete (20,000L/d), TBM cooling and spoil (14,000L/d) and mitigation measures such as washdown and dust suppression (11,000L/d). The water requirements are within the available water for London as estimated in Thames Water's Resource Management Plan. Consequently, the volume of water used is considered to be sustainable.
- 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 support the objective as they would make sustainable use of water.

Further details 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 objective, albeit with some restrictions regarding noise. The proposals would encourage equality and sustainable communities. Particular issues of relevance to the site appraisal include:

- The construction would last approximately 5.5 years. Standard and extended working hours would be in place with continued working hours required for the construction/secondary lining of the connection tunnel which are estimated to last 27 months. The *CoCP* sets out measures to ensure that health and safety within the community would not be compromised through the development.
- With embedded measures it would not be possible to mitigate significant adverse effects relating to noise at all receptors during construction. No further on-site mitigation would be possible therefore the use of double glazing and other compensation would be put in place to offset affects where appropriate. Whilst this would ensure health and safety the well-being of affected receptors could be affected should relocation be necessary.
- Health, safety and well-being would not be affected by vibration from the construction.
- The site is located within the London Borough of Greenwich AQMA. The proposals would ensure that health and safety within the community would not be at risk through emission and dust resulting from the construction.
- The number of days recreational river users are exposed to pathogens would be reduced from 204 days to 16 days per year. This would ensure health, safety and well-being of river users.
- 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. The outcomes have 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 ensure that health and safety within the community is not compromised from air quality or vibration resulting from the construction. However, some receptors would be affected by noise during construction, which could only be mitigated through compensation. This would ensure health and safety but could affect the well-being should relocation be necessary. There would be beneficial effects on recreational river users during operation as pathogens would be reduced through interception of the CSO.

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 of relevance to the site appraisal include:

- A maximum of 165 workers would be employed at any one time at this site during construction. This employment opportunity would support the objective for a strong and stable economy.
- Development on this site would result in the displacement of the builders' merchant business. Compensation measures would be in place for relocation. The proposals would support the objective assuming successful relocation.
- Three hotels in near proximity of the site would potentially be affected. Compensation mechanisms would be available for financial loss or damage to property. However, it must be noted that the outcome of a compensation claim is not guaranteed at this point.

In summary, the proposals would support the objective as they create employment opportunities and would help businesses in the surrounding area to keep business up during construction.

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 to minimise significant adverse environmental effects, however, with some restrictions relating to noise. The proposals would support the objectives regarding townscape and historic environment in the long-term. Particular issues of relevance to the site appraisal include:

Environmental effects

- The site is located within the Greenwich AQMA. Measures in the *CoCP* would ensure that there are no significant adverse effects relating to air quality.
- There would be no significant adverse environmental effects relating to vibration resulting from construction. However, there would be significant adverse effects relating to noise on two receptors during construction. No further on-site mitigation would be possible and compensation would be in place to offset affects where applicable.
- Artificial lighting would be necessary at the site in the evenings and in during continuous working hours. Measures in the *CoCP* would ensure that light spill would be minimised and not result in significant adverse environmental effects.
- Consequently, the proposals would support the objective as they seek to minimise significant adverse environmental effects, albeit with some restrictions relating to noise.

Landscape and townscape

- There would be changes to the character of the site and its surroundings during construction as existing structures and vegetation would need to be removed. Temporary site hoardings, welfare facilities, a noise shed and the presence of construction activity would add to these changes.
- The changes to the current setting of the site and surrounding would be minimal

during operation as the construction would take place on an already existing site.

Historic environment

- The site lies within an Archaeological Priority Area and includes several Grade II listed buildings. There would be changes to the historic environment due to the presence of construction equipment and activity. These changes would be restricted to the construction and measures in the *CoCP* would ensure protection of listed buildings.
- The Grade II listed Beam Engine House would be used to house ventilation structures during operation. This would require localised modifications and refurbishment. A level 3 standing structure survey would be conducted to form preservation by record and to inform the sensitive reinstatement of stairs. The proposals would support the objective by giving use to the building and ensuring its upkeep.
- Once operational there would be positive changes to the setting of the wider pumping station and the railway viaduct resulting from the proposed landscape design. Therefore, the proposals would support the objective.
- There is potential for buried heritage assets on site. An archaeological investigation and recording would be carried out to form preservation by record should buried assets show to be present on site.
- The proposals would consequently support the objective.

In summary, the proposals seek to minimise significant adverse environmental effects. However, significant effects relating to noise during construction would not be further mitigated at two receptors. The townscape would be changed during construction but would not be affected once operational. The historic environment would experience some changes during construction and would be enhanced through landscaping after construction. A Grade II listed building would be used during operation. This would contribute to its conservation by promoting its upkeep.

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 support the objective. Particular issues of relevance to the site appraisal include:

- The site is located within the Greenwich Pumping station and would make efficient and sustainable use of existing brownfield land.
- During operation the ventilation structures would be housed in the existing Beam Engine House. This would require some modifications and refurbishment of the building but would eliminate the need for construction of a new building. The proposals would therefore support the objective.

In summary, the proposals would support the objective by making efficient and sustainable use of existing brownfield and buildings.

Further information can be found in the *Environmental Statement* and the *Site Selection Record*.

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 support the objective. Particular issues of relevance to the site appraisal include:

- The peak construction (12 months) would require approximately 154 HGV movements per day. On average 50 HGV movements per day would be required on average over the construction period.
- Additional traffic resulting from the construction would be managed through measures set out in the *CoCP* such as the requirement for provision of a transport management plan to minimise detrimental impacts on the environment and community.
- The PTAL for the site has been classified as 4, indicating a good level of accessibility via public transport. Measures in the *CoCP* such as only allowing vehicles necessary to undertaking works on site would help minimise additional road traffic and therefore minimise detrimental effects on communities and environment.

In summary, the proposals would not minimise the impact arising from the transport of materials. The site has a good accessibility via public transport which would mitigate against impacts resulting from additional road traffic from site workers.

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

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