

Thames Tideway Tunnel
Thames Water Utilities Limited



Application for Development Consent

Application Reference Number: WWO10001

Planning Statement

Doc Ref: **7.01**

Appendix Y

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

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**Thames
Tideway Tunnel**



Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Planning Statement Appendix Y: Beckton Sewage Treatment Works

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Appendix Y: Beckton Sewage Treatment Works

Y.1 Introduction

- Y.1.1 A worksite is required to install new infrastructure to transfer combined sewage from the main tunnel system (including the Lee Tunnel) to Beckton Sewage Treatment Works (STW) for treatment, and to connect a new siphon tunnel to the proposed Lee Tunnel overflow shaft. The proposed development site is at Beckton STW, which is located in the London Borough of Newham.
- Y.1.2 As part of a separate project, Beckton STW is being upgraded to cater for a forecast increase in flows from the Thames Tideway Tunnel and the Lee Tunnel (the London Tideway Tunnels), based on predicted population growth. The Thames Tideway Tunnel would collect CSO discharges along the length of the tunnel and deliver these flows via the Lee Tunnel to Beckton STW. The location of the site is illustrated in Annex Y.
- Y.1.3 This assessment is structured as follows:
- a. Section Y.2 provides a brief description of the Beckton STW site.
 - b. Section Y.3 sets out the planning context for works in this location.
 - c. Section Y.4 describes the site-specific development for which consent is sought and the way in which the proposals evolved through consultation.
 - d. Section Y.5 provides an analysis of the principal site-specific planning considerations and how the proposals comply with relevant planning policy.
 - e. Section Y.6 provides an overall conclusion of the site-specific assessment for the proposed works at the site.

Y.2 Site description

- Y.2.1 Beckton STW, located in the Beckton ward of Newham, is the largest STW in the UK, with substantial areas of plant machinery, tanks and buildings. It is one of the dominant historical land use features of the area.
- Y.2.2 The site itself comprises two areas within the southern and western sections of the operational Beckton STW compound. The western section of the site comprises land under development for the Lee Tunnel and Beckton Sewage Treatment Works Extension scheme. The southern section comprises an area of hardstanding and operational infrastructure associated with the STW bounded by internal access roads. An aerial photograph of the site is provided in Figure Y.1 overleaf.
- Y.2.3 Beckton STW is bounded by the Alfred's Way trunk road to the north, Barking Creek to the east, the River Thames to the south, and by Royal Docks Road, Hornet Way and Armada Way to the west.

Figure Y.1 Aerial photograph of Beckton Sewage Treatment Works



Y.2.4 Jenkins Lane waste transfer station, a cinema and a retail complex lie to the north of the STW. To the east of Barking Creek are a large timber yard and various warehouses. An area of vacant land lies on the opposite bank of the River Thames to the south. The area to the west comprises a mixture of business and retail parks and Royal Docks Road. There are no residential properties in close proximity to the site.

Y.2.5 The key features of the site are illustrated in Annex Y.

Y.3 Planning context

Y.3.1 In developing the proposals and mitigation measures for the development at Beckton STW Thames Water¹ had regard to the policies set out in the National Policy Statement for Waste Water (the 'NPS') and to local development plan designations where they are relevant to the application.

¹ Thames Water Utilities Ltd (TWUL). The Draft Development Consent Order (DCO) contains an ability for TWUL to transfer powers to an Infrastructure Provider (as defined in article 2(1) of the DCO) and/or, with the consent of the Secretary of State, another body

- Y.3.2 In this case the local development plan comprises the *London Plan* (2011), the London Borough of Newham's *Core Strategy* 2011 and the London Borough of Newham's saved *Unitary Development Plan* (2001) policies.
- Y.3.3 Under the Town and Country Planning Act 1990, Beckton STW constitutes operational land that is specifically used or held for the purposes of carrying out Thames Water's statutory undertakings.
- Y.3.4 Policy INF3 in the *Core Strategy* provides explicit support for the project, which is designated under *Core Strategy* spatial designation U2, which passes through Beckton STW.
- Y.3.5 As defined in the *Core Strategy*, the site falls within a designated employment hub and partially within a designated Strategic Industrial Location.
- Y.3.6 The site falls within the Beckton Lands South Site of Importance for Nature Conservation (SINC) and The Greenway and Old Fort Nature Reserve SINC and lies adjacent to the River Thames and Tidal Tributaries SINC. The site also falls within the Roding Valley Archaeology Priority Area and partially within a network of green space.
- Y.3.7 A Grade II listed chimney on the southern section of the site, constructed by Sir Joseph Bazalgette as part of the STW in 1887/89, was dismantled to mitigate the Lee Tunnel works and will be reinstated by the Lee Tunnel project on completion.
- Y.3.8 A proposed bus corridor dissects the proposed site from north to south, beginning at Jenkins Lane in Barking and ending in the Royal Docks. A recreational footpath/cycle network is also indicated along the Greenway within the STW.
- Y.3.9 The main flood risk to the site is from the tidal Thames, and tidal Barking Creek. The site lies within a 'high probability' flood zone, although it is protected by flood defences.
- Y.3.10 A number of planning applications relevant to the site have been submitted within the last five years. The Lee Tunnel and Beckton Sewage Treatment Works Extension scheme comprise a storage and transfer tunnel for combined sewage between Abbey Mills Pumping Station and Beckton STW (the 'Lee Tunnel'). It also comprises an extension to STW, which is being upgraded to handle additional combined sewage flows from the London Tideway Tunnels and to prepare for future population growth. Planning permission 08/01159/LTGDC (and its subsequent amendments and associated listed building consent applications) is currently being implemented at Beckton STW.
- Y.3.11 Planning application 10/01713/LTGDC for an enhanced sewage sludge digestion facility at the site was approved in March 2011 but is not proposed to be implemented. A new application 12/01573/FUL for a revised enhanced sewage sludge digestion facility was submitted in August 2012 but has not yet been determined.

Y.4 Description of development

Overview

- Y.4.1 The proposed works at Beckton STW comprise the installation of infrastructure to transfer CSO flows from the London Tideway Tunnels to Beckton STW and the connection of a new siphon tunnel to the Lee Tunnel overflow shaft. This would entail the construction of two shafts, a siphon tunnel and the installation of two pumps.
- Y.4.2 The majority of the works required at Beckton STW are currently under construction as part of the Lee Tunnel and other projects.
- Y.4.3 Works are currently being undertaken at the site to increase the capacity of Beckton STW to process CSO flows from the London Tideway Tunnels in preparation for future population growth.

Application for development consent

- Y.4.4 The geographic extent of the proposals for which development consent is sought is defined by the limits of land to be acquired or used and the Site works parameter plan, included in the *Book of Plans*, which defines the zones within which specific elements of the proposals would be located. Table Y.1 below lists the application drawings of relevance to this site, and their status.

Table Y.1 Beckton Sewage Treatment Works: Drawings that define the proposed development

Drawing title	Status	Location
Proposed schedule of works	For approval	Schedule 1 of The Draft Thames Water Utilities Limited (Thames Tideway Tunnel) Development Consent Order (the 'Draft DCO')
Access plan	For approval	<i>Book of Plans</i> , Vol 14, Section 28
Site works parameter plan	For approval	<i>Book of Plans</i> , Vol 14, Section 28
Permanent works layout	Illustrative	<i>Book of Plans</i> , Vol 14, Section 28
Construction phases	Illustrative	<i>Book of Plans</i> , Vol 14, Section 28
Highway layout during construction	Illustrative	7.10.24 Transport Assessment Beckton Sewage Treatment Works Figures
Permanent highway layout	Illustrative	7.10.24 Transport Assessment Beckton Sewage Treatment Works Figures

- Y.4.5 The proposed structures and works at this site do not fall under the Nationally Significant Infrastructure Project. However, the works at this site are associated development (Work No. 27) and include construction of works above and below ground to transfer flows from the Tideway Pumping Station to the inlet works of the STW, installation of additional equipment at the inlet works; construction of a siphon tunnel inlet shaft,

construction of a siphon tunnel outlet shaft, construction of a siphon tunnel with superstructure above the siphon inlet shaft from the Tideway Pumping Station to the siphon tunnel outlet shaft; and construction of pits, chambers, ducts and pipes for cables, hydraulic pipelines, utility connections, utility diversions and drainage, including facilities for drainage attenuation.

Y.4.6 The full description of the proposed development can be found in Schedule 1 to the *Draft DCO*. Further details temporary construction works and permanent operational structures are contained below and an extended description can also be found in the (*Environmental Statement*, Vol 26).

Construction

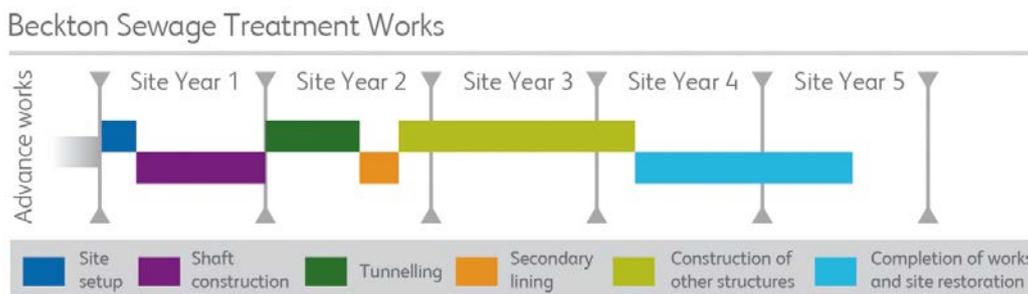
Y.4.7 Construction at Beckton STW is anticipated to take approximately four and a half years and would involve the following phases (with some overlaps):

- a. site setup (approximately two months)
- b. shaft construction (approximately ten months)
- c. tunnelling (approximately seven months)
- d. construction of other structures (approximately 18 months)
- e. completion of works and site restoration (approximately 16 months).

Y.4.8 Connection of utilities and diversion of utilities may be conducted in advance of the main activities listed above.

Y.4.9 This site would operate to the standard, extended and continuous working hours for various phases and activities as set out in the *CoCP* Part A and B (Section 4). Standard working hours would be applied to all of the above phases of construction work apart from elements of shaft construction, secondary lining and tunnel works as described below.

Figure Y.2 Construction timeline



Y.4.10 Extended working hours would be required at this site to allow for major concrete pours for shaft construction including diaphragm wall panels and other large elements. It was assumed that extended hours would be required approximately twice a week during diaphragm walling for a total duration of approximately four months (two months per shaft). It is also assumed that continuous hours would be required during the tunnel boring machine (TBM) drive for approximately seven months and during

secondary lining for approximately two months. The exact timing of any extended hours of working would be consulted on, and notified to the London Borough of Newham.

- Y.4.11 Construction traffic would access the site from Alfred's Way (A13), through the existing sewage treatment works entrance off Jenkins Lane. Traffic would leave the site via the same route.
- Y.4.12 It is anticipated that an average of 10 heavy goods vehicles (HGVs) would access the site per day for the majority of the construction period. This would rise to approximately 25 HGVs per day over an estimated five month period during the construction of the siphon tunnel. There may be additional periods during key construction activities when these HGV numbers would need to be exceeded. Further details regarding the number and breakdown of anticipated heavy goods vehicles accessing the site per day is contained within the *Transport Assessment*, which accompanies the application.
- Y.4.13 Potential layouts of the construction site are shown on the Construction phasing plans in Annex Y. It should be noted that these layouts are illustrative only. The contractor may arrange the site in a different way, depending on the chosen construction method, provided that any environmental effects are appropriately managed.

Site set-up

- Y.4.14 Hoarding would be erected around areas of heavy construction works to the heights specified in the *CoCP*. Office and welfare facilities would be set up for the project.
- Y.4.15 The approach to any land remediation that might be required cannot be defined at this stage. However, it is assumed that any remediation that is required would occur within this earliest phase of construction and that any associated lorry movements would be substantially lower than the subsequent peak during the main construction phases.

Shaft construction

- Y.4.16 The 7m and 9m internal diameter shafts would then be constructed using diaphragm wall techniques.
- Y.4.17 During diaphragm wall excavation the trench would be filled with bentonite for ground support; on completion of the excavation, steel bar reinforcement cages would be lowered in before concrete would be pumped into the trench in order to displace the bentonite and form a wall panel.
- Y.4.18 This process would be repeated for each diaphragm wall panel in order to create the full circle of the shafts. Diaphragm wall excavated material would be processed as required and then loaded onto lorries for transport off site.
- Y.4.19 The shaft excavation would commence after the diaphragm walls are complete. Excavated material would be put into skips within the shaft working area and hoisted by crawler crane from the shaft and deposited in a suitable storage area. After any required treatment, the material would

be loaded onto lorries for transport off site. Once the excavation is complete, a steel reinforced concrete base slab would be formed at the base of each shaft.

Y.4.20 It is anticipated that dewatering would be required. Dewatering wells would be drilled from within the shafts (a process known as 'internal dewatering') and groundwater extracted via pumps.

Y.4.21 It is anticipated that grouting at the toe of the diaphragm wall would also be required to reduce the flow of water.

Tunnel construction

Y.4.22 The siphon tunnel would be driven from the siphon inlet shaft. It is assumed that the tunnel would be constructed by a slurry or earth pressure balance TBM. Ground treatment would be required for the TBM launch and reception.

Y.4.23 Once launched the TBM would cut the ground by rotating the cutter head whilst hydraulic shove rams would propel it forward. The TBM would move forward and a temporary railway built behind it within the tunnel as the TBM proceeds to bring material to the TBM including precast concrete segments. The TBM would be received into the shaft on a cradle and would be lifted out of the shaft by heavy lift mobile crane, cleaned then dismantled and transported off site.

Secondary lining of tunnel and shaft

Y.4.24 Secondary lining is an additional layer of concrete placed against the inside of a tunnel's primary concrete segmental lining for watertightness and to improve the overall structural durability. It was assumed that the shaft and siphon tunnel would have reinforced concrete secondary linings.

Y.4.25 It was assumed that on completion of the tunnelling phase, a batching plant would be mobilised to site. The plant would supply the secondary lining of the tunnel. Concrete would be batched on surface and pumped or skipped to the tunnel.

Y.4.26 The secondary lining of the tunnel would be constructed by installing steel reinforcement, erecting a cylindrical shutter within a short length of tunnel and pumping concrete into the gap between the shutter and the primary lining. Once the concrete hardens sufficiently, the shutters would be removed and erected in the next section of tunnel.

Y.4.27 It is assumed that the lining of the shafts would be made of reinforced concrete placed inside the shaft's primary support. The steel reinforcement would be assembled in sections and a shutter would be used to cast the concrete against. The shutter would be assembled at the bottom of the shaft and sections of reinforcement installed and lining cast progressively up the shaft.

Y.4.28 Any reinforced concrete structures internal to the main tunnel shaft and the roof slab would be constructed in a similar manner progressively from the shaft bottom.

Construction of other structures

- Y.4.29 Approximately 0.5km of approximately 2.4m internal diameter pipe line would be constructed for flow transfer to the inlet works, either elevated above ground or in the tunnel below ground, depending on the design of the Lee Tunnel Flow Transfer System which it would duplicate. The discharge chamber which connects the flow transfer pipeline to the existing elevated inlet works would include a weir chamber and distribution pipes.
- Y.4.30 The siphon inlet shaft would be connected to the flow transfer pipeline by two approximately 2.1m diameter pipes constructed in open trench.
- Y.4.31 The siphon inlet shaft would also have two 600mm internal diameter and 30m long drain-down pipes connecting to the existing connection shaft at a depth of approximately 35m. Prior to constructing the pipes, eyes would be formed in the base of the siphon inlet shaft and in the connection shaft and the ground in between treated to control groundwater. It is assumed that the pipe would be constructed by pipe-jacking, Horizontal Directional Drilling, micro-tunnel or auger bore.
- Y.4.32 The siphon outlet shaft would be connected to the Lee Tunnel overflow shaft via a reinforced concrete valve chamber and connecting culvert, constructed using an open trench approach.
- Y.4.33 Two additional pumps and motors, pipe work and controls are required in the pumping station currently under construction by the Lee Tunnel project. The Lee Tunnel project will install four of the six pumps required (and the Thames Tideway Tunnel project would install the two additional pumps). A mobile crane would be used to lower the pumps and motors to the base of the pumping station dry well, the existing station crane (located near the base of the station) would then be used to move the pumps and motors into their final positions.
- Y.4.34 The transformers, control panels and associated equipment to be installed in the existing Power Complex building would be delivered by lorry and offloaded and moved into position using a mobile crane.
- Y.4.35 The three duplicate grit removal gantries for the inlet works grit channels would be fabricated off-site, delivered to site on low-loaders and craned into position using a mobile crane.

Completion of works and site restoration

- Y.4.36 On completion of the construction works the permanent works area would be finished in accordance with the landscaping requirements.

Operation

Flow transfer pipeline

- Y.4.37 The flow transfer pipeline would be sized for a flow of $7.65\text{m}^3/\text{s}$, being half the maximum discharge from the Tideway Pumping Station. The flow transfer pipeline currently under construction for the Lee Tunnel will take the other half of the flow.

- Y.4.38 The discharge chamber for the flow transfer pipeline would be approximately 15m x 4m in plan, extending about 2m above ground level and 5m below ground level.

Inlet works: Duplicate grit removal gantries

- Y.4.39 A duplicate set of three new grit removal gantries are to be installed at the inlet works grit channels. The new grit removal gantries would be standby units to the existing gantries. They would be operated and maintained by the same on-site teams.

Siphon tunnel and shafts

- Y.4.40 The siphon tunnel would connect the Tideway Pumping Station to the Lee Tunnel outlet shaft. The tunnel would have an approximate internal diameter of 2.8m and approximate depth of 20m.
- Y.4.41 The siphon tunnel inlet shaft would be approximately 9m internal diameter. The siphon tunnel outlet shaft would be approximately 7m internal diameter.
- Y.4.42 The Lee Tunnel outlet shaft would carry bypass flows from the pumping station to the overflow shaft outfall culverts.
- Y.4.43 The 17m by 7m by 8m high electrical and control kiosk for the siphon tunnel inlet shaft is sized to accommodate the mechanical, electrical and control equipment and access facilities associated with the siphon inlet tunnel.

Permanent restoration and landscaping

- Y.4.44 On completion of the construction works the permanent works area would be restored. No additional landscaping works are proposed.

Access and movement

- Y.4.45 Existing access to the site is from Alfred's Way via Jenkins Lane and operational access roads within the site.
- Y.4.46 During construction vehicle access would be via Alfred's Way (A13), and through the existing Beckton STW entrance off Jenkins Lane. Traffic would egress the site via the same route. Further detailed information on traffic and access can be found in the *Transport Assessment*.
- Y.4.47 Permanent hardstanding areas would be provided around shafts and chambers to facilitate maintenance. These would connect to existing hardstanding or access roads within Beckton STW.
- Y.4.48 Once the development is in operation, for safety and security reasons, Beckton STW would remain accessible only to Thames Water personnel and contractors.

Typical maintenance regime

- Y.4.49 Inspections of below-ground equipment would be required approximately every three to six months, and would be carried out as part of the maintenance activity for the sewage treatment plant and generally by personnel based at Beckton STW.

Y.4.50 Should a major blockage occur, a crane or jetting lorry would be brought to the site to clear the blockage.

Y.4.51 It is anticipated that once every ten years, a major internal inspection of the siphon tunnel and shafts would be required. It is likely that this would involve an expert team of inspection staff, a small support crew with support vehicles, and two mobile cranes to lower the inspection team into the shafts. This process would take several days.

Scheme development

Y.4.52 The requirement for works at Beckton STW is fixed as this is where the Lee Tunnel terminates and flows from the Thames Tideway Tunnel would be treated. As detailed in Section 4 of this *Planning Statement*, the use of Beckton STW was considered through the site selection process, particularly in respect of the alternative tunnel routes that were considered.

Y.4.53 The proposed Beckton STW site was subject to over two years of extensive consultation and engagement. The site featured in two full rounds of public consultation, and a period of pre-application publicity. Throughout this period the scheme evolved in response to consultation, through engagement with key stakeholders, and through on-going design development. The *Consultation Report*, which accompanies the application, contains detailed information on the consultation process.

Y.4.54 Few issues arose throughout pre-application consultation regarding the proposed use of Beckton STW. However, there are a number of planning considerations, and key design requirements, associated with the use of the site, and these are addressed in the planning assessment in Section Y.5 which follows:

- a. Principle of the use of the site: This issue is addressed in the Meeting the need and Land use including open space, green infrastructure and green belt subsections below.
- b. The need for flexibility in design: This issue is addressed in the Good design subsection below.
- c. The effect of the proposed works on amenity: This issue is addressed in the Air quality, emissions, dust and odour, Noise and vibration, Landscape and visual (including townscape), Light, and Socio-economic subsections below.

Y.5 Site-specific planning considerations

Y.5.1 This section provides an analysis of the key planning considerations associated with the proposed works at Beckton STW. It considers the issues and factors identified in the NPS and other issues such as design and amenity effects which arose from consultation and are relevant to the site. The design response to each of these issues was informed by extensive consultation with stakeholders, as set out in the *Consultation Report*, and detailed below.

Meeting the need

Y.5.2 The proposed site at Beckton STW forms a vital component of the Thames Tideway Tunnel project. It would be successful in meeting the specific need of transferring the flows from the tunnel for treatment at the existing STW.

Y.5.3 The proposed use of Beckton STW attracted few comments from stakeholders. There is broad consensus that the works are required, that this is an appropriate site, the use of which should not lead to unacceptable impacts.

Good design

Y.5.4 The proposed layout is constrained by the existing built sewage infrastructure within the site, and infrastructure which is currently under construction. The proposals are also a product of the function they need to perform in transferring and directing flows through the site, the need to carry out regular routine maintenance of plant, and the requirements of health and safety legislation.

Y.5.5 The design of the proposals for the site evolved through two rounds of consultation and continued engagement with key stakeholders. The detail of the consultation process for the site is reported in the *Consultation Report* and the *Design and Access Statement*.

Y.5.6 The principal issues that influenced design at Beckton STW arising from Thames Water's analysis of site opportunities and constraints are:

- a. Design the works with the flexibility to fit with the existing operational STW site and the final layout of the Lee Tunnel project works.
- b. Design the project works to be in keeping with the existing STW.
- c. Manage construction impacts.

The need for flexibility

Y.5.7 In its application for development consent, Thames Water sought to achieve an appropriate balance between certainty and flexibility. Approval is therefore sought through the application for development consent for a scheme framed within defined parameters and design principles.

Y.5.8 The design proposals at Beckton STW require a high level of flexibility. The STW is undergoing considerable change and expansion as part of the Lee Tunnel and Beckton Sewage Treatment Works Extension scheme. In order to ensure that the project works are compatible with this scheme and any associated final design amendments the design presented in this application for development consent is illustrative, except for the site works parameter plans, which are for approval.

Y.5.9 The Site works parameter plans define the zones within which certain elements of the project would be located, including a vertical zone which limits the height of the proposed structures.

Design to be in keeping with the existing STW

- Y.5.10 A key design aspiration for further developing the designs at a later date is to ensure the designs are in keeping with their operational surroundings and to contribute to the use of the site as a strategic STW site.
- Y.5.11 The scale of the proposed above-ground structures is also determined by the functional requirements. The appearance of the project structures would be in keeping with existing structures, plant and buildings at the site.
- Y.5.12 The proposed structures would be modest in comparison to the below-ground works and the existing and approved new structures at the STW. The appearance of the proposed above-ground structures would be appropriate and in keeping with existing structures, plant and buildings at the site. The project signature design would not be used for ventilation outlets as this would be out of keeping with the operational site (design principle BESTW.02). Materials shall be durable, robust, and comply with Thames Water standard requirements (design principle BESTW.03).
- Y.5.13 The proposed above-ground structures would be integrated around the existing vehicular and pedestrian routes within the site. No additional landscaping works are proposed.

Managing impacts of construction

- Y.5.14 The *CoCP* submitted as part of the application for development consent sets out how the environmental effects resulting from the construction of the project would be managed. The *Draft DCO* includes requirements that the construction works are to be carried out in accordance with the *CoCP*.
- Y.5.15 Design measures to manage impacts of construction traffic are outlined in *CoCP* Part A which includes the provision of site-specific transport management plans which set out how vehicular access to the site would be managed so as to minimise impact on the local area and communicate this with the local borough and other stakeholders.
- Y.5.16 Further specific design measures to minimise temporary construction impacts at this site are outlined in the *CoCP* Part B and include the specification of construction traffic access, and the protection of trees and habitats.

Water resources and flood risk

- Y.5.17 In terms of ground water resources there are no licensed or known abstractions from the upper or lower aquifers within a radius of 1km of the Beckton STW site. The nearest Source Protection Zone lies approximately 1.2km away to the north. There are no environmental designations relevant to groundwater in the vicinity of the Beckton STW site.
- Y.5.18 The Lee Tunnel and the sewage works upgrades proposed at Mogden, Beckton, Crossness, Long Reach and Riverside STWs would be operational by the time construction of the project commences. Significant improvements in the water quality in the tidal Thames are anticipated as a result of these projects.
- Y.5.19 With the measures incorporated into the design and *CoCP*, including adherence to good pollution prevention practice, potential construction

impacts on surface water resources, river flows and groundwater resources are not predicted to be significant.

- Y.5.20 The project would divert flows that would previously have been discharged as combined sewage to the tidal Thames during rainfall events, to be discharged from Beckton STW as treated effluent. No effects on the discharge quality from the Beckton STW outfall would result from the project, but there would be a slight increase in the discharge quantity from the Beckton STW effluent channel once the project is operational.
- Y.5.21 No significant effects on surface or groundwater quality are anticipated either during construction or operation.
- Y.5.22 Beckton STW lies adjacent to the confluence between the River Roding (also known at this location as the Barking Creek) and the tidal Thames. The Environment Agency Flood Map identifies the Beckton STW site to lie within three different flood zones (Zones 3a, 2 and 1) as a result of tidal flooding from the River Thames and Barking Creek.
- Y.5.23 The risk of tidal flooding at the Beckton STW site is therefore considered to be high due to parts of the site being located in Flood Zone 3a. The site is protected from tidal flooding by three grouped sets of formal flood defences including a raised flood defence wall along the edge of the River Thames, the final effluent channel of the STW which acts as a formal flood defence along the Barking Creek, and the Barking Barrier which offers additional protection to land adjacent to Barking Creek.
- Y.5.24 As the works would not involve any change to flood defences, or any removal of flood storage, there would not be an increase in flood risk as a result of the proposed development at Beckton STW. Therefore no flood risk issues arise from the proposals at this location.
- Y.5.25 The site is therefore considered to meet the decision making principles set out in the NPS in respect of water quality, resources and flood risk.

Air quality, emissions, dust and odour

- Y.5.26 As a result of previous exceedances of air quality objectives, the London Borough of Newham has declared an Air Quality Management Area along the main road corridors across the borough. The Beckton STW site is not in the Air Quality Management Area, although the A13 corridor to the north of the site is. Local monitoring data indicates that the air quality standards for nitrogen dioxide are regularly exceeded in the vicinity of the site.
- Y.5.27 The closest sensitive receptors to the development are nearby commercial and retail premises, and residential dwellings, schools and recreational users of the River Thames beyond.
- Y.5.28 Through the measures included within the *CoCP* all reasonable steps have been taken, and would be taken, to minimise detrimental impacts on amenity resulting from air quality, emissions and dust as identified in the NPS. With the implementation of the *CoCP* measures, the overall effect on local air quality from construction (ie, effects from construction road traffic, construction plant and construction dust), would not be significant at any of the closest sensitive receptors.

- Y.5.29 There have been numerous complaints regarding odour from Beckton STW since 2005 however a number of projects are underway at the site to reduce odour impacts, including the covering of the primary settlement tanks. These projects will be in place by the time the Thames Tideway Tunnel project is operational and will lead to a significant improvement in local air quality. The consideration of odour impacts is also set out in the project-wide section of the *Planning Statement*. The ventilation strategy for the project is designed to ensure that there would be no significant loss of amenity, and no nuisance, as a result of odour from the operation of the scheme at all locations.
- Y.5.30 The construction and operational effects with regard to air quality and odour would be consistent with the NPS policy objectives (at paras. 4.3.11 to 4.3.15 and 4.11.4 to 4.11.5) to minimise detrimental impacts on amenity and nuisance. Appropriate measures are proposed to ensure that the proposals would not lead to a material deterioration of, or change in, air quality or a significant loss of amenity at this location.

Biodiversity and geological conservation

- Y.5.31 The site is located partially within Beckton Lands South SINC. However, the habitat for which the SINC was designated is no longer present therefore this is not considered to comprise an ecological resource. The Greenway and Old Ford Nature Reserve SINC runs west to east through the Beckton STW and partially within the proposed site. The southern part of the site is located adjacent to the designated River Thames and Tidal Tributaries Site of Metropolitan Importance.
- Y.5.32 In respect of both terrestrial and aquatic ecology, no significant adverse effects are predicted on designations, habitats or species either during construction or operation.
- Y.5.33 In accordance with NPS policy, the proposed development would avoid significant harm to biodiversity and geological conservation interests. Opportunities to conserve and enhance biodiversity in the proposals for this site were taken. In addition, the *CoCP* includes measures to address adverse effects during construction, including reinstating and replacing trees and planting. In addition, the proposed provision of bat boxes on completion of the works would result in a significant benefit for these species.
- Y.5.34 As required by the NPS (para. 4.5.17), the footprint of the proposals is no larger than necessary and measures are in place to mitigate any adverse effects and to put in place proposals to enhance the value of long-term habitats on the site.

Landscape and visual impacts

- Y.5.35 Beckton STW is the largest sewage treatment works in the country, with extensive areas of operational plant, machinery, tanks and buildings. The site is undergoing extensive upgrade works associated with the Lee Tunnel and STW extension and a number of other projects are on-going at the site. The site does not lie within or in proximity to any nationally or

- locally designated landscapes. The site is therefore considered to be of limited townscape value.
- Y.5.36 There are no sensitive receptors in the immediate vicinity of the site, and none have clear views of the proposed site.
- Y.5.37 The proposed works would be within the existing operational sewage treatment works site. The proposed structures would be modest in comparison to the below-ground works and the existing and approved new structures at the STW. The appearance of the proposed above-ground structures would be appropriate and in keeping with existing structures, plant and buildings at the site.
- Y.5.38 The proposals are consistent with the approach required in Section 4.7 of the NPS as they were designed taking careful account of the landscape characteristics of the area, and through considered construction layout, design and the *CoCP*, the effects of construction would be minimised as far as possible.
- Y.5.39 The works at this site would not result in any significant impacts on townscape or views.

Land use including open space, green infrastructure and green belt

- Y.5.40 The project works at Beckton STW would be constructed and operated on land owned solely by Thames Water in operational wastewater use, which would be consistent with the existing use. Given the long established use of the site the proposed works would be consistent with its historic and current land use, and the use of this site is considered to be acceptable in principle.
- Y.5.41 The impact of the proposals on land uses and designations (as identified in the *Core Strategy* and retained policies) was a key consideration in the site selection process and design development. The land use plan in Annex Y illustrates the land uses of the site and the surroundings.
- Y.5.42 The site and the wider STW are within a designated employment hub and partially within a designated Strategic Industrial Location reflecting the strategic importance of this utility site.
- Y.5.43 Part of the proposed site is located within a network of designated green space but no longer forms part of a Metropolitan Open Land designation, which is afforded the same protection as Green Belt. The *Open Space Assessment*, which accompanies the application, reviewed the quality and value of this area and assessed the potential impact of the project upon it. The Greenway, which runs east to west immediately to the south of the site, also forms part of this green space network.
- Y.5.44 Despite falling within this designation, the site's location within the operational Beckton STW means it is not publicly accessible, for safety and security reasons and does not provide any open space amenity function. It is therefore not proposed to remove any open space from public use, or provide public access to designated areas within the pumping station compound.

- Y.5.45 A proposed bus corridor dissects the proposed site from north to south, beginning at Jenkins Lane in Barking and ending in the Royal Docks. This forms part of the proposed East London Transit bus link, a currently unfunded strategic transport proposal intended to contribute towards Newham's regeneration and economic and physical development. There is general policy support for this proposal; however, the route is only indicative at this stage and no firm proposals are presented.
- Y.5.46 Surrounding land uses were reviewed and considered in the site selection process and on-going design development. Owing to the site's location within the operational Beckton STW, and the proposed design principles and parameters, it is not considered that the proposed works would negatively affect the surrounding land uses, during either construction or operation. Similarly, it is not considered that any extant planning permissions, committed developments, or policy allocations for future development would be adversely impacted as a result of the works in this location.

Noise and vibration

- Y.5.47 There are no receptors that are sensitive to noise and vibration within 500m of the site. In accordance with the NPS, no significant noise effects are predicted as a result of the construction or operation of the works at this site.
- Y.5.48 Furthermore, and in accordance with the NPS, a series of measures detailed in the *CoCP* are embedded in the project design, compliance with which is secured through a requirement. The measures include operating in accordance with best practice, selecting the quietest cost-effective plant available, and optimising plant layout to minimise noise emissions.

Historic environment

- Y.5.49 There is one designated heritage asset within and in the vicinity of the Beckton STW site. The site contains the site of a Grade II listed chimney constructed by Bazalgette as part of the sewage treatment works in 1887/1889. The chimney was dismantled as mitigation for the Lee Tunnel works and will be reinstated by that project. The proposals would have no impacts on the timing of this reinstatement or location of the chimney. The area does not contain any other nationally designated (statutorily protected) heritage assets, such as scheduled monuments, listed buildings, or registered parks and gardens.
- Y.5.50 The site lies within an extensive Archaeological Priority Area which covers the Thames floodplain in recognition of its high potential for palaeoenvironmental and other archaeological remains. The site does not lie within a conservation area and contains no locally listed buildings.
- Y.5.51 A number of the structures at the STW are historically important despite not being listed, including the northern outfall sewer.
- Y.5.52 There would be no direct impacts or loss of significance for designated heritage assets. No significant effects on any other heritage assets either during construction or operation are anticipated.

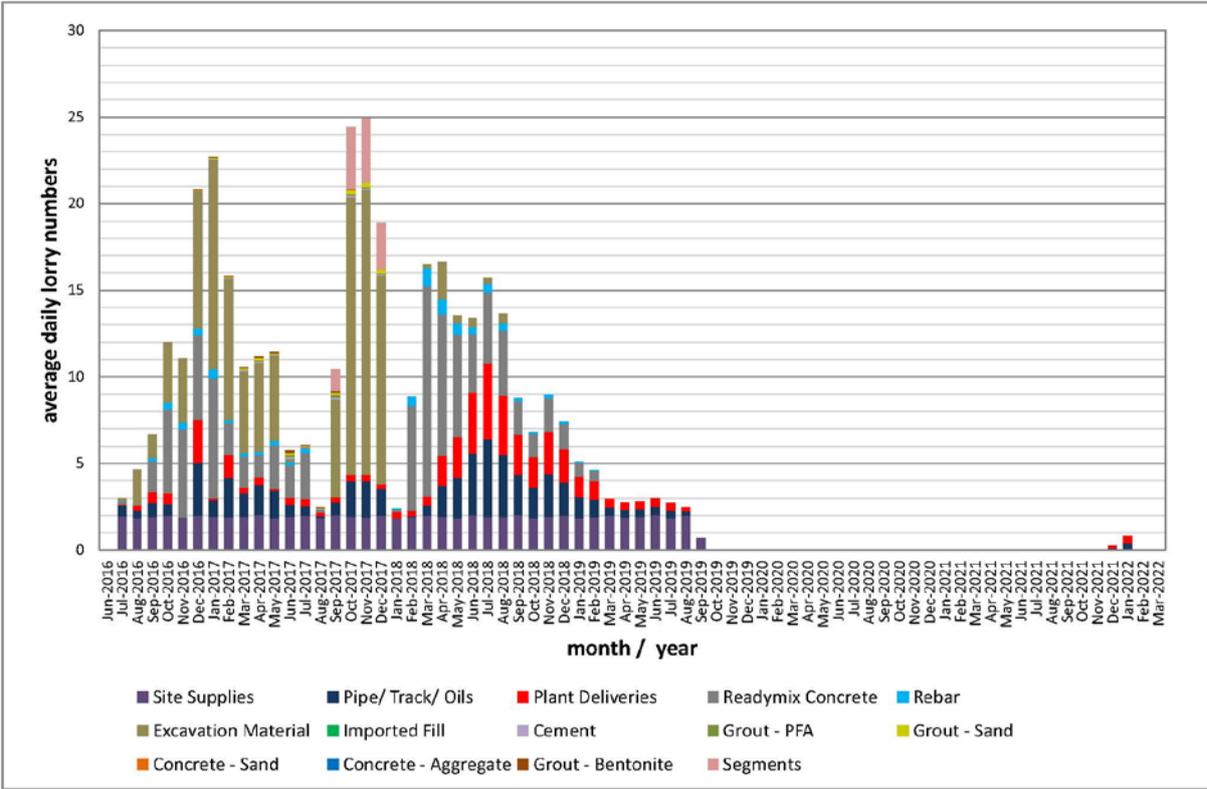
Light

- Y.5.53 A screening assessment carried out into the daylight/sunlight impacts of the proposed development concluded that there would be no material impact on sunlight or daylight from either construction or the permanent works.
- Y.5.54 There would be no significant effects from lighting either during construction or operation of the works at Abbey Mills Pumping Station. Through the measures set out in the *CoCP*, all reasonable steps having been taken to minimise any detrimental impact on amenity from artificial light.

Traffic and transport

- Y.5.55 The Beckton STW has low public transport accessibility. It is located in proximity to three daytime local bus services. Gallions Reach Docklands Light Rail station lies approximately 1.3km to the south, and Barking Station (serving London Underground, London Overground and National Rail services) is some 2.4km to the north.
- Y.5.56 The site is located within the Beckton STW complex and benefits from good road access. The proposed access to the site during construction and operation would be from Alfred's Way (A13), and through the existing STW entrance off Jenkins Lane.
- Y.5.57 During construction vehicle movements would take place on weekdays between 8am to 6pm. Up to one hour before and after these hours would be used for mobilisation and demobilisation. Mobilisation may include loading, unloading, and arrival and departure of staff and movement to and from the site. In exceptional circumstances HGV, on agreement with the local authority and abnormal load movements could occur up to 10pm or later for large concrete pours. Thames Water would require contractors to produce a green travel plan to encourage the use of public transport by those working on the project.
- Y.5.58 A significant proportion of the construction waste would be reused on site in accordance with NPS policy, the *London Plan* Waste Management Hierarchy and the project-wide Waste Strategy. This would avoid the need for this material to be transported elsewhere by road.
- Y.5.59 As shown in Figure Y.3 overleaf, an average a peak of 50 daily HGV movements (25 HGVs) is expected during shaft and tunnel construction works (year two of construction). At other times in the construction period vehicle flows would be lower than this average peak figure. The site has good access to the strategic road network, through the existing operational site.

Figure Y.3 Estimated construction HGV histogram



- Y.5.60 The works would not result in any significant construction impacts on pedestrian routes, cycle routes and facilities, public transport routes and patronage, parking or the highway network.
- Y.5.61 Measures to reduce transport impacts included in the *CoCP* cover heavy goods vehicle management and control measures such as designated routes to sites for construction vehicles. There is also provision for management plans for construction worker journeys to and from the site. In addition to the general measures in the *CoCP* Part A, the following measures were incorporated into the *CoCP* Part B in relation to the Beckton STW site:
 - a. Access to the site would be through the Thames Water operational site.
 - b. Access would be from the Alfred's Way (A13) to the main Beckton STW entrance.
- Y.5.62 During the operational phase, all the functional elements of the development would be located within the operational STW site. Access for maintenance vehicles would be via the existing site entrance. It is not considered that there would be any significant transport effects during the operational phase given the nature of the site and the infrequent expected vehicle visits.
- Y.5.63 In accordance with the decision-making criteria in the NPS (paras.4.13.6 to 4.13.10) transport impacts would be successfully managed, through committed *CoCP* measures, such that no significant transport impacts are anticipated.

Waste management

- Y.5.64 The Waste Strategy was developed to provide a framework for the management of materials and waste that would be produced throughout the construction and operational phases of the project. This ensures that the requirements set out in para. 4.14.6 of the NPS would be satisfied, and the Waste Strategy would be secured via a requirement in accordance with para. 4.14.7 of the NPS.
- Y.5.65 No particular site-specific waste issues arise at this site.

Socio-economic

- Y.5.66 There are no specific socio-economic issues associated with the proposed use of the site at Beckton STW.
- Y.5.67 The site falls partially within a designated green space, but given its location within the operational Beckton STW complex, for safety and security reasons it is not publicly accessible. There are no users of the site therefore that would experience socio-economic effects.
- Y.5.68 There are also no sensitive receptors in the vicinity of the site that would experience significant amenity effects arising from the construction or operation of the works at this site.
- Y.5.69 In accordance with the NPS, an *Equalities Impact Assessment* was undertaken. It found that there would be no equalities impacts arising from the proposals at this site.

Y.6 Overall conclusions

- Y.6.1 The project is proposed to prevent large volumes of sewage discharging into the tidal Thames. This site forms a vital component of the project as it would be used to transfer the flows from the tunnel for treatment at the existing Beckton STW. The selected site is suitable and the application proposals would meet the identified need.
- Y.6.2 The site is entirely within Thames Water's operational STW and surrounded by plant, machinery, tanks and buildings. The STW is undergoing considerable change and expansion as part of the Lee Tunnel and Beckton Sewage Treatment Works Extension scheme.
- Y.6.3 The proposed use of Beckton STW attracted few comments from stakeholders. There is broad consensus that the works are required, that this is an appropriate site, the use of which should not lead to unacceptable impacts.
- Y.6.4 Due to the site's location within a large operational STW, remote from sensitive receptors, and with good access to the strategic road network, no significant negative effects are predicted to arise during the five and a half year construction period. Furthermore, Thames Water sought to minimise any potential disturbance through sensitive design and mitigation measures where required, in accordance with the NPS and relevant local policies.

- Y.6.5 The detailed design of the permanent infrastructure would be carefully considered at a later date so as to successfully integrate the works into the operational site and avoid any significant environmental effects.
- Y.6.6 The proposed works at the Beckton STW site and the mitigation measures that were developed and advanced as part of the application for development consent directly accord with the approach required by the NPS. Adverse effects have been minimised as far as possible and the design would be in keeping with its operational surroundings and contribute to its use as a strategic STW site.
- Y.6.7 Section 8 of the *Planning Statement* considers the implications of the local effects of the works Beckton STW and the other sites, and describes the overall balance between impacts and benefits associated with the project as a whole, against the guidance in the NPS. It concludes that the works at Beckton STW, and the project as a whole, are compliant with the NPS and that development consent should be granted.

Annex Y: Drawings for Beckton Sewage Treatment Works

List of drawings

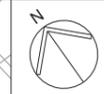
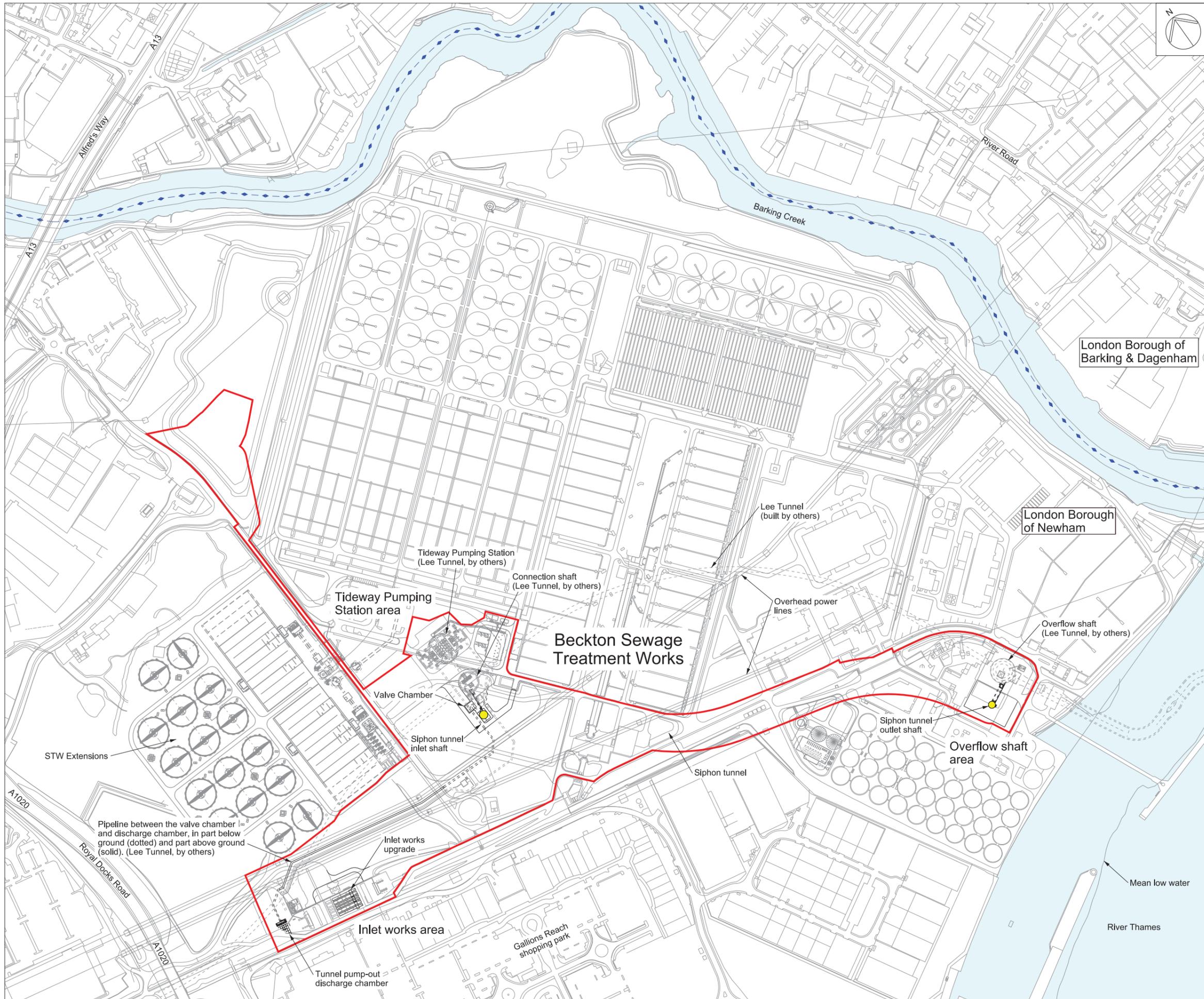
Beckton Sewage Treatment Works: Location plan

Beckton Sewage Treatment Works: As existing site features plan

Beckton Sewage Treatment Works: Construction phases plans

Beckton Sewage Treatment Works: Land use plan

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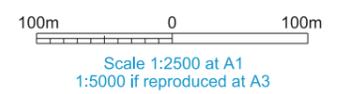
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- Key:**
- Local authority boundary
 - Order limits
 - Tunnel
 - Shaft

- Notes:**
1. The alignment of the tunnels are illustrative within limits of deviation.
 2. The Lee Tunnel and STW extensions are currently under construction and will be 'existing' when construction of the Thames Tunnel project commences.



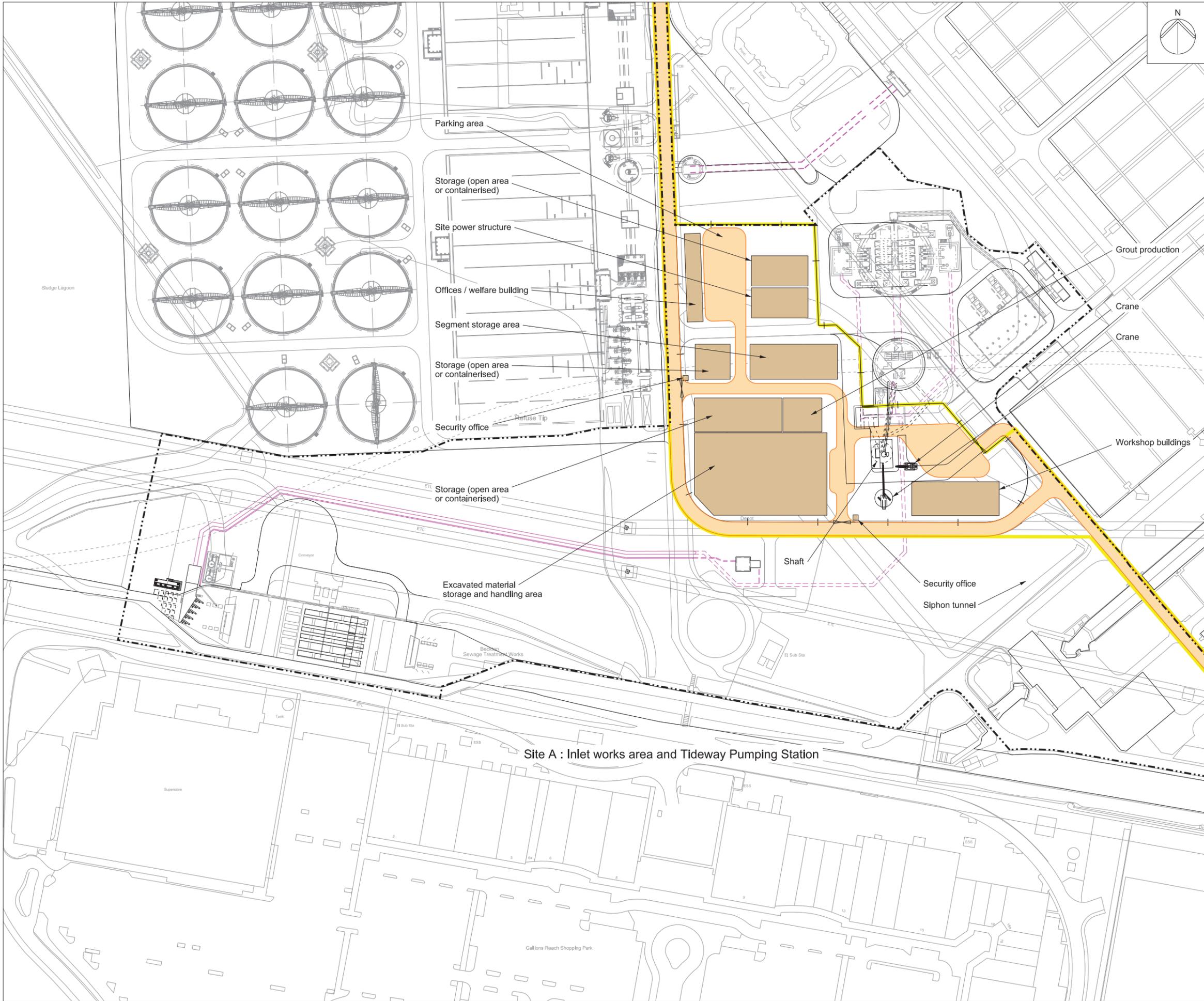
FOR INFORMATION

Location
 Beckton STW
 London Borough of Newham

Document Information
 Application for Development Consent
 Location plan

Book of plans - section 28
 DCO-PP-27X-BESTW-280001
 January 2013





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- Key:**
- Limits of land to be acquired or used (LLAU)
 - Hoarding
 - Maximum extent of working area
 - Site access
 - Access / haul route
 - Existing sewers

- Notes :**
1. These construction phasing plans have been prepared to illustrate possible site layouts for the principle construction phases. Contractors may choose to lay sites out differently during construction depending on their preferred construction methods subject to any controls on layout imposed through the planning submission and approval process.
 2. Traffic management plans for construction phases of the work would be submitted to the appropriate authority for approval. Where appropriate, outline traffic management arrangements are shown.
 3. Utility supplies for the construction of the works would be agreed with the relevant utility company.
 4. Additional noise mitigation including noise barriers may be required but is not shown on this drawing.

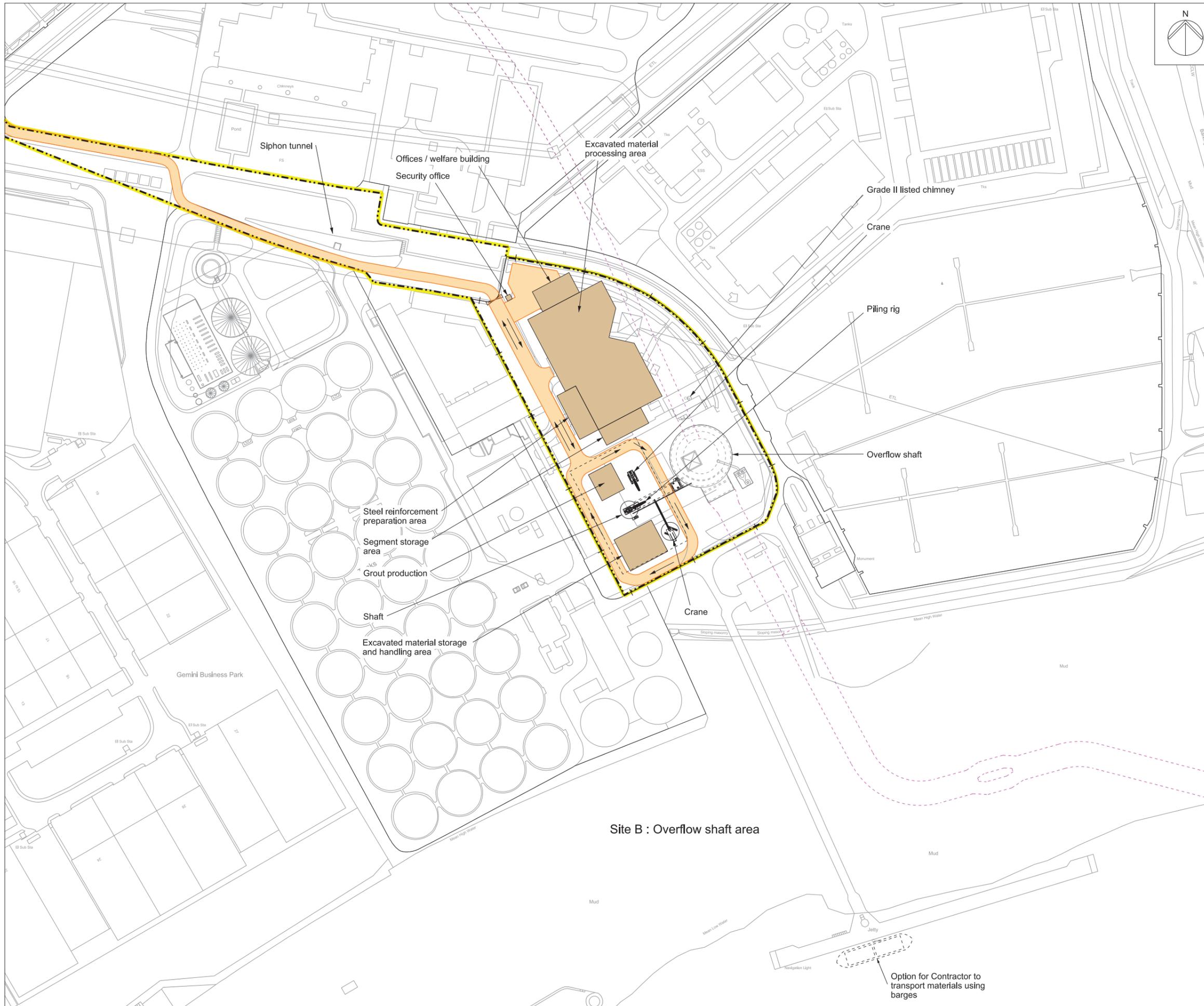
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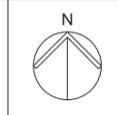
Location
 Beckton STW
 London Borough of Newham

Document Information
 Application for Development Consent
 Construction phases - phase 1 - site A
 Setup, shaft construction & siphon tunnelling
 Book of plans - section 28
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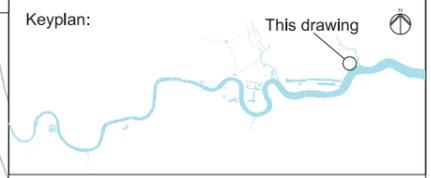




Site B : Overflow shaft area



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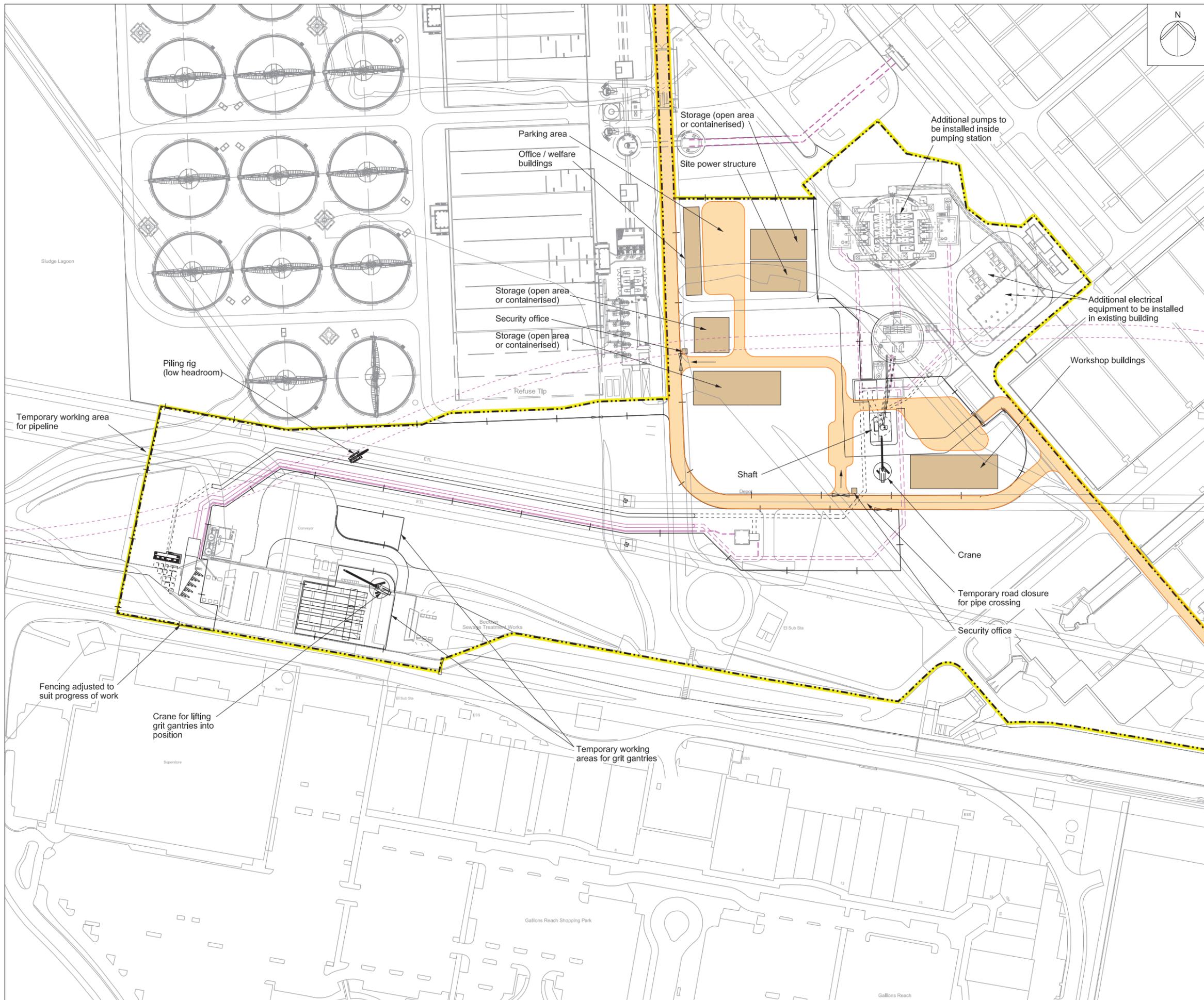
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 DCO-PP-27X-BESTW-280010
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Keyplan:

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Key:

- Limits of land to be acquired or used (LLAU)
- Hoarding
- Maximum extent of working area
- Site access
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 January 2013





- Key**
- Limits of Land to be Acquired or Used
 - Local Authority Boundary
- Land Use**
- Class A1-A5 (Shops, Financial & Professional Services, Restaurants, Drinking Establishments and Hot Food Takeaways)
 - Class B1 (Business (Offices except A2) Research and Development, Light Industry)
 - Class B2-B8 (General Industrial / Storage or Distribution)
 - Class D1-D2 (Non Residential Institutions (Community Facilities) and Assembly and Leisure)
 - Other
 - Open Space



Scale 1 : 8,000 at A3

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 London Borough of Newham

Document Information
Planning Statement

Land use

1PL03-MG-00803
 January 2013



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