

The Planning Inspectorate  
Temple Quay House (2 The Square)  
Temple Quay  
Bristol  
BS1 6PN

**Our ref:** SL/2016/115920/01-L02  
**Your ref:** TR010021  
**Date:** 15 November 2016

Dear Sir/Madam

**APPLICATION BY TRANSPORT FOR LONDON FOR AN ORDER GRANTING  
DEVELOPMENT CONSENT FOR SILVERTOWN TUNNEL  
WRITTEN REPRESENTATIONS BY THE ENVIRONMENT AGENCY**

Please find enclosed our written representations for the Silvertown Tunnel Project. Please note, we have quoted the Thames Estuary 2100 Plan in our letter. We understand that the applicant will be submitting a copy of this plan to you. If you have any questions or require any clarification on the points below, please do not hesitate to contact me.

Yours faithfully

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## Written Representations On behalf of the Environment Agency

### 1.0 Flood risk management

As explained in our Relevant Representations the Environment Agency has a general supervisory duty in relation to flood risk management matters. The Environment Agency has the power to carry out flood risk management works to any main river, which includes the Thames, but has no duty to do so. In London we are responsible for overseeing and ensuring the continued integrity and stability of a network of tidal flood defences. This includes not only the Thames Barrier, but a further 8 major flood barriers, 400 moveable structures and over 300 km of wall and embankment in 3,000 different ownerships.

### 1.1 Thames Estuary 2100 Plan

We developed the Thames Estuary 2100 Plan (TE2100) to recommend how to manage tidal flood risk to the end of the century and beyond. The plan sets out how 1.25 million people and £200 billion worth of property will continue to be protected from tidal flood risk.

TE2100 recommends the actions the Environment Agency and others will need to take in the short, medium and long term. The plan is based on contemporary understanding of predicted climate change, but is designed to be adaptable to changes in predictions (including for sea level rise) throughout the century. Page 44 of the plan gives an overview of the policies for this part of London. The Mayor's Spatial Strategy (the London Plan) states in relation to TE2100:

#### ***'Policy 5.12 Flood risk management Strategic***

*A The Mayor will work with all relevant agencies including the Environment Agency to address current and future flood issues and minimise risks in a sustainable and cost effective way.*

#### ***Planning decisions***

*B Development proposals must comply with the flood risk assessment and management requirements set out in the NPPF and the associated technical Guidance on flood risk over the lifetime of the development and have regard to measures proposed in Thames Estuary 2100 (TE2100 – see paragraph 5.55) and Catchment Flood Management Plans.'*

It goes on to state:

*'The Government has endorsed the Environment Agency's Thames Estuary 2100 (TE2100) Plan, which sets out recommendations for tidal flood risk management for London and the Thames Estuary up to 2100. TE2100 recommends continued maintenance, refurbishment and improvements to the current defences, with some raising of river walls. This should continue to provide London with a high standard of protection from tidal floods. TE2100 estimates that the arrangements for major changes to London's flood defences must be in place by 2070. In order to leave room to raise river walls in a sustainable and cost effective way, some land may have to be safeguarded, and development may need to be set back along the Thames through London. If land is not available, the walls will reduce views across the river and they will be much more expensive to build. There also remains a level*

*of risk, equivalent to 0.1 per cent chance per year – a low risk but not one that could never happen. This means it is still vital at the planning and design stage to consider what would happen to buildings if such a flood were to occur.'*

## **1.2 Flood risk management in London**

In flood risk management terms the London area is unusual, in that in what is known as the 'London excluded area' there is local legislation which places a legal obligation on riparian owners (those owning land next to the River Thames) to maintain the flood defences on their land. This is not the case elsewhere in England. The Environment Agency can take legal action to enforce this legislation, although we endeavour to encourage riparian owners to take action voluntarily where possible. The works at both ends of the Silvertown Tunnel are within the 'London excluded area'.

## **1.3 Thames tidal defences**

We would like to reiterate the points we made in our Relevant Representations in relation to flood risk management. We are concerned about the tidal flood defences on both banks of the river which are affected by the proposed tunnel works. The red line boundary for the DCO covers a much larger stretch of the north bank however, where the flood defences are generally much older and in a poorer state of repair.

It is important that the defences on both the north and south banks can be maintained and raised in the future, as flood risk is predicted to increase with climate change. These defences form part of the Thames tidal defences and protect people and properties in Newham and Greenwich. Pages 119 and 122 of the TE2100 plan outline the extent of tidal flood risk in this area. The plan sets out that these defences will need to be raised in the future from the current crest level of approximately 5.18 AOD, to 5.7m AOD in the year 2065, and to 6.2m AOD in the year 2100. Assessments of the ability to do future raising should assume that a new wall will need to be built on the landward side of the existing defences to achieve the 6.2m AOD future crest level or alternatively, demonstrate that the existing walls have a residual life long enough to take them to the future raising date

## **1.4 Surveys**

Since we lodged our Relevant Representations TfL has begun the intrusive surveys of the flood defences we requested, and has shared some preliminary findings with us. It is essential that this work is progressed, and that TfL provides evidence to demonstrate that:

- Construction activities will not impact on the structural integrity of any of the flood defences affected. If the DCO is granted this evidence should be provided to us for approval prior to any construction activities commencing
- Works will not prevent or increase the costs of future raising of the defences to keep up with climate change. Appendix D of the Visual Survey Report provided by TfL outlines possible options for future flood wall raising. However these options assume that the existing walls have a significant residual life making it a possibility they will be fit for purpose in 2100, and that simple crest raising would be feasible. In many instances, this is not a realistic assumption. It is also important that the costs of future raising will not be unreasonably increased as a result of the tunnel scheme being in situ. For example, if raising or rebuilding defences in close proximity to the tunnel would necessitate excessively expensive mitigation or construction techniques, this would be unacceptable as riparian owners would then be placed under an additional

financial burden to raise defences to TE2100 levels.

In addition, TfL have a responsibility to maintain a fit for purpose tidal flood defence during their occupation of the site. We seek a specific provision for this in the protective provisions for the benefit of the Environment Agency. The protective provisions need to ensure that if the obligations on riparian owners under local legislation are to be disapplied, the obligation falls instead on TfL whilst the works affecting the river wall are carried out.

If it is not possible to demonstrate these points, improvement works to the defences or other suitable mitigation (such as changing construction methodologies or ensuring less loading on the wall) will need to be carried out by TfL as part of the DCO. A mitigation plan will also need to be submitted to the Environment Agency for approval. To demonstrate that the works will not prevent or increase the costs of future raising, TfL should carry out a desk study demonstrating that the cheapest raising options that would be feasible today with would still be feasible post tunnel construction.

The results of the intrusive surveys, as well as the subsequent mitigation reports are required to be provided prior to the commencement of works either by a Grampian style DCO requirement or within the protective provisions for the benefit of the Environment Agency. This is important to allow an understanding of what improvement works TfL may need to do as part of the DCO.

### **1.5 Zone 12**

At least one wall (referred to as “Zone 12”) is in such a poor condition that TfL have stated they do not wish to carry out intrusive investigations on this section for fear of causing further structural harm. This section is immediately above the line of the tunnel on the north bank. Ideally, we would have needed detailed information on the condition of this wall, including the depth of the embedded sheet piles and ground anchors of the river wall at this location. This is because the tunnel boring machine will be operating at a shallow depth beneath the river wall.

In the absence of this intrusive survey work for Zone 12, full information on this wall will not be available until contractors have started work on the site. Without information from intrusive surveys it will be not be possible to accurately ascertain the extent/ condition of this flood defence (depth of pile embedment, and length/angle of ground anchors) or therefore to assess impacts on this wall from boring the tunnel underneath it, and other construction activities in close proximity. It will therefore not be possible to understand what strengthening or mitigation TfL may be required to carry out in order to ensure these flood defences remain fit for purpose at all points in time, while they are on site.

It is likely that works to ‘Zone 12’ will need to be completed in the near future to ensure it remains fit for purpose. Discussion are ongoing between the Riparian Owners (Greater London Authority and Quintain), EA and TfL about these. Given the uncertainty around the current condition of ‘Zone 12’ and any potential impacts from the tunnel’s construction, it may not be possible for TfL to demonstrate to the Environment Agency’s satisfaction that the works will not adversely affect the river wall.

Other sections of the river wall on the northern bank are also in poor condition, and may also need rebuilding or strengthening, both to facilitate TfL tunnelling works and/or to ensure fit for purpose flood defences to the wider Newham area. We are in discussions with TfL and the riparian freeholders to explore how these works will be delivered and funded.

## **1.6 Monitoring and maintenance**

The local legislation – the Metropolis Management (Thames River Prevention of Floods) Amendment Act 1879 - relating to maintenance of flood defences places a statutory duty on riparian owners to maintain flood defences. The applicant seeks to disapply this legislation for the purposes of the construction of the tunnel. We do not object to this provided the applicant is prepared to agree to a clause in the protective provisions placing the obligation to maintain the flood defences on the person having control of the works. Following construction, the riparian owners would have the statutory duty to maintain the flood defences. However, we do seek a clause in the protective provisions requiring a river wall monitoring plan to be agreed by us in writing. The plan should include

1. Baseline monitoring and results
2. Construction monitoring, agreed trigger levels and mitigation plan
3. Post construction monitoring (for 2 years) and mitigation.

## **1.7 Scour**

In section 1.3 of our relevant representation we raised concerns about the potential impact of scour on the flood defences which could potentially destabilise embedded river walls. TfL has consulted on us on a Technical Note Assessment of Jetty Pile Scour in the Nearshore which seeks to address this risk. We are currently reviewing this report, and understand that TfL will submit this to the Examining Authority in due course. At present our concerns remain outstanding on this issue but we will update the Examining Authority in due course.

## **1.8 NAABSA (Not Always Afloat But Safely Aground) Berth**

TfL needs to provide more information on the proposed use of the NAABSA berth, and whether any re-commissioning works will be required (for example dredging, or works to the river wall). Although the berth is in use currently, if the nature of use during construction will intensify the impact on the river wall, or there is a cumulative impact from numerous activities occurring on the foreshore, this could have a destabilising effect. We do not believe it to be a safe assumption that TfL's activities will have exactly the same (or less) loadings on this defence than current activities, or that no additional preparatory works will be required. TfL will need to provide evidence to the Environment Agency that their activities will not cause a detriment to the defence, including any cumulative impacts, and may need to carry out strengthening or other mitigation.

Specifically any dredging in close proximity to the wall (to level the Berth) should be assessed cumulatively with TfL's loading scenarios (from the cranes/plant on the riverside)

## **2.0 Water Framework Directive assessment**

In our relevant representations, we stated that we had WFD compliance concerns with regards to water quality. TfL has since provided an updated WFD compliance assessment. We understand this will be submitted to the Examining Authority in due course. We have had the opportunity to review this report, along with annex A (CEFAS Chemistry certificate of analysis). We are satisfied that this report has now addressed our outstanding WFD related concerns.

We note that construction activity is not included specifically within the dredge assessment. However we consider that the WFD risk from this would be no greater than that which has

been thoroughly evaluated within the dredge assessment. We would anticipate that the piling and dredging would be consecutive rather than happening at the same time. Therefore we expect the risks to the water body from the jetty construction would be similarly low.

The future demolition of the jetty and removal of the piles could potentially re-suspend sediments. However we recommend the WFD impacts of that activity would be best assessed nearer that time, so that the most up to date sediment data can be used. We would recommend a DCO requirement, firstly ensuring that the jetty is removed and decommissioned following the works, and also that a WFD assessment be provided at the decommissioning stage.

### **3.0 Groundwater protection and land contamination**

Since making our relevant representations, we have had the opportunity to comment on a draft groundwater monitoring strategy. We agree with the general strategy that is proposed, but advised TfL to consider and mitigate for the risk that some boreholes that the strategy relies on may no longer be in place in the near future. We understand that TfL will shortly be submitting an updated version of this report to the Examining Authority, addressing this concern. We are pleased to note that the draft DCO includes a requirement for a Groundwater Monitoring and Verification Plan.

We will also seek a DCO requirement to secure further ground investigations, any necessary remediation works and a verification report confirming that any contamination risks have been addressed and that the site will be in a satisfactory condition.

The Code of Construction Practice states that TfL will seek approval from us before using polymers required with the Tunnel Boring Machine. It is important that TfL does consult us, as we will be able to advise whether they need an Environmental Permit to use a substance.

### **4.0 Fisheries and biodiversity**

The Environment Agency has a general statutory duty to promote the conservation of flora and fauna dependent on an aquatic environment and a specific duty to maintain, improve and develop the fisheries of salmon, trout, eels, smelt and freshwater fish. The parts of the tunnel works affecting the River Thames have the potential to adversely affect fish in the river. We therefore seek a number of measures to be included in the DCO to minimise any harmful effects to fish.

#### **4.1 Dredging**

We seek a requirement to avoid all planned (i.e. non-emergency) dredging during the months of June, July and August. If dredging during these months is essential to the construction programme, then approval should be sought from the Environment Agency to ensure that suitable mitigation is in place. For example we may require water quality monitoring, or the use of low impact dredging techniques.

The reason we seek to avoid planned dredging during these months is that dredging can reduce dissolved oxygen (DO) levels and suspend sediment. DO levels in the river are typically low already during the summer months, as water temperatures are higher, and flows are reduced. Summer storms are also known to result in extensive areas of low DO in the Thames. Fish are sensitive to changes in water quality, and poor water quality has the potential to cause fish mortalities. During the summer months, there are higher numbers of

juvenile fish in the river. Due to their size, they are less able to move away from hypoxic (oxygen depleted) conditions, and so are more vulnerable to the impacts of dredging.

#### 4.2 Piling

As stated in our relevant representations, we seek a restriction to the effect that TfL shall not commence any piling until a piling method statement has been submitted to and approved by the Environment Agency. This could either be secured by way of a requirement or in the protective provisions. We would not require any seasonal restrictions in relation to vibration or silent piling techniques. However percussive or impact piling should only take place from November to March inclusive in order to avoid noise and vibration affecting key fish spawning and migration periods. We would suggest this specific prohibition be contained in the requirement relating to the piling method statement.

#### 4.3 Light disturbance

We note that the draft DCO includes a requirement for a lighting management plan. We look forward to commenting on this when it becomes available, to ensure impacts on the marine environment are minimised.

#### 4.4 Protective Provisions

TfL has included provisions to protect the fishery in the draft protective provisions. Subject to the above, the form of wording relating to protection of the fishery is acceptable to us.

#### 5.0 Waste and materials

Please see the table below, in response to the Examining Authority's First Written Questions ref MR8:

| <b>Table 13-9 Example waste facilities within reasonable proximity of the Scheme<br/>Site address</b> | <b>Annual Quantity (tonnes)</b>   | <b>4 year total (2019-2022) tonnes</b> |
|---|---|--|
| Victoria Deep Water Terminal and Bethels Wharf Recycling Centre                                       | 800,000   | 3,200,000                              |
| Veolia Landfill Rainham   | 1,000,000 non-hazardous<br>700,000 inert (not including restoration)<br>Void space 3.1m3 (2016) | 2,800,000                              |
| Anchor Bay Wharf  | 80,649<br>74,999 inert<br>plus hazardous waste (asbestos)                                       | 322,596                                |
| Mohawk Wharf Recycling Centre   | 25,000 Hazardous<br>50,000 Non-hazardous  | 300,000                                |
| Veolia Landfill Pitsea  | 1,500,000 per annum overall<br>1,000,000 non-hazardous<br>500,000 inert                         | 2,000,000                              |
| RSPB Cliffe Pools   | N/A   | N/A                                    |
| Storefield Aggregates   | 1,300,000 remaining   | 433,333                                |

We note that the draft DCO includes a requirement for a Site Waste Management Plan to be submitted for approval, but it does not specify to whom. We do not have a preference whether it should be approved by the Local Planning Authority or the Environment Agency, but either way would like to have the opportunity to comment on this document.

## **6.0 Disapplication of Legislation and Protective Provisions**

TfL seeks to disapply various pieces of legislation for the period of construction of the works authorised by the DCO. These are listed in Article 3 of the draft DCO. Those relevant to the Environment Agency are

Metropolis Management (Thames River Prevention of Floods) Amendment Act 1879  
Thames Barrier and Flood Prevention Act 1972  
Thames Water Authority Land Drainage Byelaws 1981  
Environmental Permitting Regulations 2010 (regulation 12 only which relates to a flood risk activity)  
Water Resources Act 1991 s24 (abstraction licences)  
Byelaws under paragraph 5, 6 or 6A of Schedule 25 Water Resources Act 1991

The Environment Agency is prepared to consider disapplication of this legislation provided TfL agrees to appropriate protective provisions for the benefit of the Environment Agency to be included in the DCO though we would stress that we would not agree to the disapplication of the 1879 Act beyond the completion of the tunnel works which affect the river wall as we would want the legal obligations of riparian owners to maintain the flood defences to resume.

TfL included draft protective provisions for the benefit of the Environment Agency in the draft DCO submitted with their application. We have considered these draft provisions and will shortly be discussing them in detail with TfL. We will be requiring additions to the protective provisions put forward by TfL.

We will update the Examining Authority on the progress of the discussions regarding protective provisions in due course.

## **7.0 Attendance at Hearings**

We will be happy to attend the hearing relating to environmental issues to explain any of the above representations in further detail if that will assist the Examining Authority. Alternatively the Examining Authority may wish to schedule a separate hearing on flood risk issues.