Statement of Common Ground between Transport for London and the Marine Management Organisation

December 2016

MAYOR OF LONDON

TRANSPORT FOR LONDON

EVERY JOURNEY MATTERS

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Silvertown Tunnel

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1.0	August 2016	First issue for comment to stakeholder
1.1	November 2016	Second issue for comment to stakeholder

Contents

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SOCG Reference: SoCG004

1. Introduction

1.1 Purpose of the document

1.1.1 This Statement of Common Ground (SoCG) is submitted to the Examining Authority in relation to the application by Transport for London (TfL) under section 37 of the Planning Act 2008 (the Act) for an order granting development consent for the construction of the Silvertown Tunnel ("the Scheme").

1.1.2 The aim of this SoCG is to provide a clear record of the issues discussed and the current status of those discussions. The SoCG can be used as evidence of these discussions in representations to the Examining Authority as part of its examination of the DCO application.

1.2 Parties to this Statement of Common Ground

1.2.1 This Statement of Common Ground (SoCG) has been jointly prepared by TfL and the Marine Management Organisation (MMO). It sets out matters which are agreed between both parties, as well as matters which are not agreed and matters which are under discussion.

1.3 Structure of the Statement of Common Ground

1.3.1 This SoCG comprises six sections:

Section 1 is an introduction to the SoCG and the Scheme;

Section 2 provides an overview of consultation to date between TfL and the MMO;

Section 3 provides a summary of the main areas and topics covered by this SoCG;

Section 4 provides a list of matters agreed;

Section 5 provides a list of matters under discussion;

Section 6 provides a list of matters still not agreed; and

Section 7 contains the parties' signatures.

1.4 The proposed scheme

1.4.1 The Scheme involves the construction of a twin bore road tunnel providing a new connection between the A102 Blackwall Tunnel Approach on Greenwich Peninsula (Royal Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing/Silvertown Way (London Borough of Newham). The Silvertown Tunnel will be approximately 1.4km long and will be able to accommodate large vehicles including double-deck buses. It will include a dedicated bus, coach and goods vehicle lane, which will enable TfL to provide additional cross-river bus routes.

1.4.2 The Scheme also includes the introduction of free-flow user charging at both the Blackwall Tunnel (northern portal located in London Borough of Tower Hamlets) and the new Silvertown Tunnel. This measure will play a fundamental role in managing traffic demand and supporting the financing of the construction, maintenance and operation of the Silvertown Tunnel.

1.4.3 On the north side, the tunnel approach road connects to the Tidal Basin Roundabout, which will be altered to create a new signal-controlled roundabout linking the Silvertown Way, Dock Road and the Lower Lea Crossing. Dock Road will be realigned to accommodate the new tunnel and approach road. On the south side, the A102 will be widened to create new slip road links to the Silvertown Tunnel. A new flyover will be built to take southbound traffic exiting the Blackwall Tunnel over the northbound approach to the Silvertown Tunnel. The Scheme includes minor changes to Tunnel Avenue including the removal of the bus-only gate allowing access for all vehicles between Blackwall Lane and Ordnance Crescent. The Boord Street footbridge over the A102 will be replaced with a pedestrian and cycle bridge.

1.4.4 New portal buildings will be located close to each tunnel portal to house the plant and equipment necessary to operate the tunnel.

1.4.5 Main construction works could commence in late 2018 and will last approximately 4 years with the new tunnel opening in 2022/23. A Tunnel Boring Machine (TBM) will be used to bore the main tunnel sections under the river with shorter sections of cut and cover tunnel at either end linking the bored sections of the tunnel to the portals. The proposal is to erect and launch the TBM from specially constructed chambers at Silvertown and Greenwich Peninsula where the bored sections and cut and cover sections of the tunnel connect. The main construction worksite will be located at Silvertown, utilising

the existing barge facilities at Thames Wharf along with a new temporary jetty for the removal of spoil and delivery of materials by river. A secondary worksite will be located adjacent to the alignment of the proposed cut and cover tunnel on the Greenwich Peninsula.

1.5 Introduction to the MMO

1.5.1 The MMO is an executive non-departmental public body (NDPB) established and given powers under the Marine and Coastal Access Act 2009. The MMO was established to make a significant contribution to sustainable development in the marine area and to promote the UK government's vision for clean, healthy, safe productive and biologically diverse oceans and seas.

1.5.2 The MMO is the competent authority for the intertidal zone of the River Thames.

1.5.3 The MMO has a statutory responsibility under the Marine and Coastal Access Act for monitoring compliance and enforces the conditions within the deemed Marine Licences consented through the DCO and has the powers to vary these conditions post consent.

1.5.4 Where a marine licence is deemed within a DCO for projects which fall within the marine area, the MMO is the delivery body responsible for post-consent monitoring, variation, enforcement and revocation of provisions relating to the marine environment under that licence.

1.5.5 The marine licence proposed to be deemed within the DCO is included in Schedule 12 to the Draft DCO (Document Reference 3.1).

1.5.6 TfL has engaged with the MMO on the Scheme during the pre-application process, including both non-statutory engagement and formal statutory consultation carried out pursuant to section 42 of the Planning Act 2008.

2. Record of engagement undertaken

2.1.1 A summary of the meetings and correspondence that has taken place between TfL and the MMO in relation to the Scheme is outlined below.

2.1.2 Copies of key letters and minutes of meetings referred to below are provided in Appendix A of this Statement of Common Ground for convenient reference.

Date	**Form of correspondence**	**Key outcomes and points of discussion**
30/04/15	Pre-application advice letter on the Reference Design Documents	Points of advice provided on licensable activities including: - Disposal of material - In-river works (impacts of dredging and removal of piles) - Settlement mitigation works - Flood defences
13/10/15	Pre-application advice letter regarding draft Marine Ecology Chapter of the Preliminary Environmental Information Report	Provides advice on the proposed scope and assessment methodology including requirements for survey work to be carried out.
12/11/15	Meeting	Main points of discussion include: - Deemed Marine Licence (DML) - Marine Ecology Surveys - Sediment Sampling
25/11/15	Section 42 response letter to Statutory Consultation	Comments on the PEIR Chapter 10 Marine Ecology,

		covering issues including: - Licensable activities including suggested conditions for DML - Impacts from dredging - In-river impacts from the construction and operation of the jetty (including hydrodynamics and sediment transport) - Noise and vibration impacts - Scope of the assessment and baseline information
21/12/15	Sample Plan letter	- Response to request for sediment sampling plan outlining sampling and analysis required.
11/01/16	Email	- Confirmation of sediment sampling methodology
12/04/16	Meeting	- Main points of discussion relate to Chapter 10 Marine Ecology of the Environmental Statement including: Baseline information - Impact Assessment during construction and operation of the Scheme - DML
12/08/16	Email	- Comments on DML requesting inclusion of a requirement for a construction method

		statement
15/11/16	Written Representation submitted at Deadline 1	- Comments received from MMO's technical advisor and CEFAS in relation to benthic ecology, underwater noise and coastal processes.

2.1.3 TfL has aimed to address all the points raised by the MMO during consultation.

3. Topics contained within this SoCG

3.1 Topics included in SoCG

3.1.1 The following topics have been discussed with the MMO with regards to Chapter 10 of the Environmental Statement (Marine Ecology), the relevant appendices, and the Deemed Marine Licence:

- Baseline Information
- Assessment Methodology
- Environmental Design Measures and Mitigation
- Assessment Findings and Conclusions
- Deemed Marine Licence

4. Matters agreed

Ref	Description of matter	Details of agreement	Record of agreement
4.1 Baseline Information			
4.1.1	**Existing baseline (benthic ecology)** The MMO consider the baseline description of species and habitats in the wider Thames as sufficiently accurate. (Section 42 response letter dated 25th November 2015)	**It is agreed** that description of the existing baseline with regard to benthic habitats and species, as presented in Chapter 10 Marine Ecology of the ES (Document Reference 6.1) is comprehensive and sufficient to determine the value and vulnerability of the ecological receptors potentially affected by the Scheme.	TfL and MMO are in agreement (email 20 September 2016).
4.1.2	**Existing baseline (Fish and Shellfish Ecology)** The MMO recommended that information on the length ranges of the fish species as provided by the EA will be helpful to identify if the specimens were juvenile or	As outlined in Chapter 10 Marine Ecology (Document Reference 6.1), Table 10-6, Table 10-7 and Table 10-8, average length of demersal fish, pelagic fish, and migratory has been obtained to update the baseline data and used to inform the assessment. **It is agreed** that description of the existing baseline with regard to Fish and Shellfish, as presented in	TfL and MMO are in Agreed (Email 13 December 2016)

Ref	Description of matter	Details of agreement	Record of agreement
	adult fish, as potential impacts upon them may differ (Section 42 response letter dated 25th November 2015).	Chapter 10 Marine Ecology of the ES (Document Reference 6.1) is comprehensive and sufficient to determine the value and vulnerability of the ecological receptors potentially affected by the Scheme.	
4.2 Environmental Design Measures and Mitigation			
4.2.1	**Overall approach to mitigation** Annex 1 of the Section 42 response letter dated 25th November 2015 suggests specific mitigation measures suggested by the MMO including soft-start piling procedures, timing of construction works and pollution prevention measures.	As noted in section 10.5 'Scheme design and mitigation' of Chapter 10 Marine Ecology (Document reference 6.1) and the CoCP (Document Reference 6.10), the suggested measures suggested by the MMO will be implemented throughout the construction, operation and demolition phase to avoid and minimise any effects on ecological receptors. **It is agreed** that the mitigation measures have been recommended based on the findings of the surveys and the assessment. These measures have been incorporated into Section 8 of the Code of Construction Practice (Document Reference	TfL and MMO are in agreement (email dated 20 September 2016).

Ref	Description of matter	Details of agreement	Record of agreement
		6.10). **It is agreed** that these are appropriate and adequately mitigate the impacts on marine ecology resulting from the Scheme.	
4.3 Assessment Findings and Conclusions			
4.3.1	**Waste disposal** The MMO noted that confirmation of whether the dredged material will be disposed of to land or at sea should be included in the ES. The potential impact of this activity on sensitive marine receptors needs to be assessed clearly (Section 42 response letter dated 12th November 2015).	As stated in paragraph 10.1.1 of Chapter 10 Marine Ecology (Document Reference 6.1), dredge arisings will not be disposed of at sea. **It is agreed** that it is appropriate to determine the exact methods for disposal of the dredge material as part of the detailed SWMP.	TfL and MMO are in agreement (20 September 2016).

Ref	Description of matter	Details of agreement	Record of agreement
4.3.2	**Removal of moorings/piles and demolition of the temporary jetty**	As outlined in Section 10.6 of the ES (Document Reference 6.1), an assessment of the potential impacts of the removal of the temporary jetty indicates that the impacts mainly relate to the introduction of non-invasive species when dismantling the jetty. The conclusions of the assessment of the impacts from the removal of temporary jetty, as undertaken in Chapter 10 Marine Ecology of the ES (Document Reference 6.1) are **agreed**.	TfL and MMO are in agreement (email 20 September 2016).
4.4 Deemed Marine Licence (DML)			
4.4.1	**Scope of DML** The MMO has confirmed that the tunnelling works are exempt from the requirement for a marine licence (Section 42 Response letter dated 12th November 2015).	It is agreed that the bored tunnelling works carried out wholly under the bed of the Thames which are authorised by the DCO are exempt from the requirement for a marine licence (and therefore the scope of the DML) by virtue of section 75 of the Marine and Coastal Access Act 2009 and articles 4 and 35 of the Marine Licensing (Exempt Activities Order 2011 (SI 2011/409).	TfL and MMO are in agreement (email 20 September 2016).

5. Matters still under discussion

Ref	Description of stakeholder issue	Transport for London response	Current position	Record of discussions
5.1 Assessment Methodology				
5.1.1	**Surveys** The MMO advised that intertidal and subtidal surveys (intertidal ecology surveys and sediment sampling) would be required to inform the assessment including sediment contaminant analysis and particle size analysis (as noted in the S42 response letter 25 November 2015 and Sample Plan letter 21 December 2015)	As set out on Chapter 10 Marine Ecology of the ES (Document Reference 6.1), Phase 1 ecology and sediment sampling surveys were undertaken in December 2015 and January 2016.	The MMO have raised concerns in their Written representations of 15 November 2016 following consultation with Cefas. These concerns relate to the phase 1 habitat survey, for which successful samples were taken at 2 of 10 stations, and that 2 samples may not adequately reflect the marine ecology of the entire area. Some further samples may be required to more accurately characterise	

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			the marine ecology of the area.	
5.1.2	**Dredging** The MMO advised that potential impacts from dredging on marine sensitive receptors should be considered in the Environmental Statement (as noted in Section 42 response letter dated 25 November 2015).	As presented in Section 10.6 of the ES (Document Reference 6.1), the potential impacts from dredging activities have been considered based on the proposed method of dredging and disposal.	Given the response in comment two MMO believe it is difficult to determine at this time whether all marine receptors necessary have been considered. It is considered that appropriate consideration has been given to those identified, but further	

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			sampling may identify receptors that have not been given consideration.	
5.1.3	**Underwater noise** The MMO advised on the criteria to be used in the assessment, i.e. quantitative thresholds for recoverable injury, mortality and potential mortal injury in fish in response to pile driving, among other sources (as noted in Section 42 response letter dated 25 November 2015).	As set out in section 10.6 of Chapter 10 Marine Ecology of the ES (Document Reference 6.1) and Appendix 10.C Underwater Noise Assessment (Document Reference 6.3.10.3), an underwater noise assessment was undertaken using quantitative thresholds including fish hearing sensitivity thresholds from piling and dredging.	The MMO believe the potential behavioural impacts for fish from impact piling have not been adequately addressed, as detailed in the MMO's Written Representations of 15 November 2016. Impact criteria should be derived from peer-reviewed scientific literature, as was advised in the MMO's response to the PEIR.	

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5.1.4	**Underwater Noise** The MMO explained in the written representation dated the 15th November 2016, that the source of the major and minor disturbance thresholds attributed to Southall et al., (2007) for proposed sound pressure level (SPL) criteria should be clarified.	Chapter 4 in Southall et al. (2007) includes a detailed review of criteria for behavioural disturbance of high frequency cetaceans (i.e. harbour porpoise). The behavioural response criteria for pinnipeds were derived from Harris et al. (2001). Further reference is provided by Bailey et al. (2010) which reports on all these criteria in Table 2 of their peer reviewed paper.	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	
5.1.5	**Underwater Noise** The MMO requested further clarification in the written representation dated the15th November 2016 on how the distances for behavioural reactions from marine mammals have been	The distances provided in the table were calculated using the Nedwell et al. (2007) dBht metric (90dBht for major disturbance and 50dBht for minor disturbance). The distances using the Southall et al. (2007) behavioural thresholds for pinnipeds and cetaceans have also been provided here for	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	derived.	completeness. A major and minor behavioural response in seals is predicted to occur within the region of 60 m and 2 km respectively. A major and minor behavioural response in harbour porpoise is predicted to occur within the region of 3 km and 13 km respectively.		
5.1.6	**Underwater Noise** In the written representation dated the 15th November 2016, the MMO stated potential behavioural impacts for fish from impact piling activities have not been adequately addressed. It has been assessed solely using the dBht metric which is not supported by peer-	The Applicant believes there are currently no peer-reviewed behavioural response criteria for fish. Popper et al. (2014) states that the risk of a behavioural impact on fish is considered to be high for fish near to the source of impact piling, moderate at intermediate distances and low in the far-field. However, Popper et al. (2014) does not	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	reviewed literature. The impact criteria should be derived from peer-reviewed scientific literature and relevant to the specific source (i.e. impact piling). This was raised to the Applicant in advice on the PEIR in 2015.	provide any thresholds for behavioural effect or clarification on the specific distances affected. Therefore, the underwater noise assessment has applied the dBht metric to evaluate the potential behavioural effects of impact piling on different fish species. Although this metric has not been published, it has been recognised to have some value in peer-reviewed scientific literature (e.g. Thompson et al., 2013; Popper et al., 2014).		
5.1.7	**Underwater Noise** The MMO expressed concerns in the written representation dated the 15th November relating to propagation loss model outlined in the Underwater	The logarithmic spreading propagation model has been used to support numerous developments and has been accepted by regulators to date. The Applicant is not aware of any definitive or regulatory guidance on underwater	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	Noise Assessment in Appendix 10C of the ES. It should be clarified if field measurements had been carried out to test and validate model predictions of sound propagation loss.	noise propagation models and their application in different marine environments. It is also worth noting that the National Marine Fisheries Service (NMFS) in the United States recommends the use of this practical spreading model for predicting the attenuation of sound from a noise source and have incorporated this model in their in-house pile driving calculator. When submitting an application, the NMFS requires use of this pile driving calculator to assess the potential impacts of pile driving on fish. No field measurements have been carried out to test and validate the model predictions of sound propagation loss. However, the		

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		attenuation and absorption coefficients of the propagation model are based on field measurements collated by the Environment Agency of piling undertaken at a range of coastal and estuarine locations. We are aware that the spreading loss model can underestimate noise levels close to the source and overestimate noise levels further from the source (Farcas *et al*., 2016). On this basis, the simple propagation model will have overestimated noise exposures at long ranges. In other words, it may have overestimated the maximum range of effects of different response thresholds. Furthermore, this model does not take account of absorption and scattering as a result of		

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		suspended sediments. Levels of suspended sediments in the Thames Estuary are relatively high and this would attenuate the propagation of noise. Overall, the simple sound propagation model is likely to have overestimated rather than underestimated noise exposures. Therefore, the assessment conclusions presented within the ES are worst case.		
5.1.8	**Underwater Noise** In the written representation dated the 15th November 2016, the MMO stated that the assessment states that vibro piling techniques will result in an estimated mean unweighted zero-to-peak vibro piling SL of 196 dB re 1 µPa m. It should be clarified	Vibro-piling can reduce the SL of percussive piling during construction by approximately 30 dB re 1 µPa m (Illinworth and Rodkin, 2007). Hence a vibro piling source level of 196 dB re 1 µPa m has been derived by subtracting 30 dB from the impact piling source level of 226 dB re 1 µPa m. Measured levels of sound from vibro	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	how this source level has been derived as no references or explanation has been included.	pilling of 1m piles also indicate source level to be in this region (Illinworth and Rodkin, 2007).		
5.2 Baseline Information				
5.2.1	**Benthic Ecology** In the written representation submitted on the 15th November 2016, the MMO stated that only 2 stations were successfully sampled during the sub tidal survey and it was not considered to accurately reflect the marine ecology of the survey area as the sediment at stations which could not be successfully sampled is presumably coarser,	TFL are currently reviewing comments received from MMO.	The MMO have no comments to add at this time.	

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	reflecting different habitat conditions and an altered ecology. Further sampling therefore may be required. using a grab more suited to coarser sediments (e.g. a mini hamon grab) to obtain an accurate representation.			
5.2.2	**Benthic Ecology** In the written representation dated the 15th November 2016, the MMO stated that Section 10.4.19 of the ES also states '*no visible fauna or signs of fauna (such as casts, trails or burrows) were recorded in the survey*' *is symptomatic of an impoverished intertidal community*'. The MMO do not agree with this statement	TFL are currently reviewing comments received from MMO.	The MMO have no comments to add at this time.	

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	as the community may be diverse and densely populated even in the absence of any visual features, only the community appears to lack those taxa which leave evidence of feeding on the sediment surface.			
5.2.3	**Extent of mudflat habitat** In the written representation dated the 15th November 2016, the MMO stated that it is difficult to assess the suitability of the statement '*the extent of mudflat habitat in this area is small and is considered to be of limited ecological importance*' in Section 10.4.20 of the ES without data to support this.	TFL are reviewing comments received from TFL.	The MMO have no comments to add at this time.	

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	It should be clarified how large the mudflat is and the spatial extent and location of other mudflat habitats in the vicinity of the site.			
5.3 Environmental Design and Mitigation Measures				
5.3.1	**Dredging** As noted in the relevant representation letter dated 31st August 2016, the MMO advised that eco-bucket dredge could further eliminate potential for contamination though noting that the proposed backhoe dredge method is considered to be sensible as it results in low levels of suspended sediments.	It is the Applicant's view, although the sediments shows some *'Localised occasionally elevated concentrations of lead, mercury and cadmium compared to Cefas AL2, and concentrations of some PAH compounds greater than the Canadian PEL'* within the Order Limits as stated in paragraph 16.4.37 of Chapter 16 of the ES (updated at deadline 1) the assessments states in paragraph 16.6.13 that *'the proposed works at Silvertown are not expected to lead*	The MMO note TfL's response. Provided that the requirement for a method statement to be signed off is held within the projects DML the MMO do not consider it necessary to finalise the type of dredge at this time, and further consideration can be given at the time of detailed design	

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		to a long-term deterioration of the assessed contaminants (i.e. specific pollutants, priority substances or priority hazardous substances) within the Thames Middle transitional water body, nor prevent the water body from meeting its WFD objectives'. Therefore the eco-bucket should not be necessary and the proposed backhoe dredge method is considered appropriate for this Scheme. However if the contractor were to select the 'eco-bucket' it would not change the conclusions of the assessment. As part of the protective provisions with the PLA, the Applicant must submit plans of any works in the river to the PLA to be approved before commencing construction. The protective provisions make specific reference	and condition discharge. That said, for clarity the MMO will seek further advice from Cefas on TfL's response to reduce the burden of work post consent.	

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		to the fact that these plans must include 'construction methods', which, in the context of jetty construction, will include dredging. The PLA will therefore approve the method of dredging prior to commencement. Furthermore, the dDML makes provision for the MMO to approve the methodology for the licensable activities. As the licensable activities refer to the authorised development in Schedule 1, dredging related to the jetty, which forms part of Work 20, will therefore fall within the remit of such approval.		
5.3.2	**Coastal Processes** The MMO in their written representation dated the 15th November 2016 requested	TfL have amended the DML within the dDCO submitted at deadline 1 [REP-095].	Having reviewed the DCO for the project held on the PINS website on 07 December 2016 there does not appear to be a table detailing specific	

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	details of all planned dredging operations and seabed preparation be provided in a table, with related size of the area/areas to be dredged, the depth of the proposed dredging, as well as the total dredge volume. If not possible at this stage, MMO would like a requirement for the inclusion of a condition within the DML requiring a method statement to be signed off for all activities covered by the DML, to allow for thorough assessment and approval post consent.		quantities or a requirement to submit a method for any licensable works as a means of secondary approval. As such it may be the case that the MMO have not had sight of the most up to date DCO, as submitted at Deadline 1, at this time.	

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5.3.3	**Coastal Processes** The MMO in their written representation dated the 15th November noted that in order to prevent or further reduce water quality impacts from resuspension (Suspended Sediment Concentration (SSC) and contaminants), further mitigation measures to limit resuspension from dredging and eventually also from disposal are required. These can be addressed through a Waste Disposal Strategy and a Construction Environment Management Plan (CEMP).	The impacts of suspended sediments were simulated and calculated to be negligible, as set out in paragraph 16.6.11 of the ES [REP1-109]. The ES paragraph 10.6.81 indicates that the preferred method of dredging is to utilise a backhoe excavator, and the contractor will be required to use the best available method to minimise the potential for suspension of sediment. This is outlined in section 15.4 of the Code of Construction Practice (REP1-119). See discussion above in relation to the potential impact from suspended solids. As set out in paragraph 10.1.1 of the ES [REP1-103] and paragraph	As detailed paragraph 3.2 of the MMO's written representations, cefas have raised concerns that the modelling used for suspended sediment transport does not consider the worst case scenario. As such there is a lack of confidence in the assessment of the impacts of suspended sediments.	

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		13.3.1 of the CoCP (REP1-119), disposal of dredging waste and the methods for disposal (should this be required) will be determined as part of a detailed Site Waste Management Plan (SWMP). The SWMP will include mitigation measures relating to the collection, storage, transportation and treatment of the sediment arisings sufficient to protect the surface water quality (as well as other environmental concerns).		
5.3.4	**Coastal Processes** The MMO in their written representation dated the 15th November 2016 noted that no monitoring measures were included (e.g. bathymetry for scour and	Monitoring measures have not been proposed because the model indicates that scour is only likely to be up to approximately 1m (see paragraph 16.6.5 of the ES [REP1-109]) and this would not make a significant difference either to the structure or to the overall condition	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	dredging) were outlined in the main ES or in Volume 7.6 Monitoring Strategy.	of the river. We are not predicting large sediment deposition due to the dredging operation and so this should not impact navigation.		
5.4 Assessment Findings and Conclusions				
5.4.1	**Construction of the jetty (noise disturbance from piling)** The MMO agree with the conclusions in terms of underwater noise impacts confirming that it is currently almost impossible to come to clear conclusions on the nature and levels of man-made sound that have potential to cause effects upon marine invertebrates (Section 42 response letter	The conclusions of the assessment are presented in Chapter 10 Marine Ecology of the ES (Document Reference 6.1) including the assessment of the impacts on from the construction of temporary jetty and associated noise impacts on ecological receptors from piling.	The MMO have no further comments to make on the potential impacts of underwater noise on marine invertebrates.	

Ref	Description of stakeholder issue	Transport for London response	Current position	Record of discussions
	dated 12th November 2015).			
5.4.2	**Construction of Jetty** As noted in the relevant representation letter dated 31st August 2016, the MMO sought clarification on whether there will be any loss of or impact on the mudflat habitat in the area of the proposed works below mean high water springs, noting that the intertidal mudflat is a Biodiversity Action Plan (BAP) Priority Habitat (UK Biodiversity Action Plan 2008), protected under the Natural Environment and Rural Communities (NERC) Act	The Phase 1 Intertidal Habitat Survey, as reported in paragraph 1.3.4 of ES Appendix 10.B Marine Ecology Survey Report [APP-067], recorded the mudflat habitat in the study area to be limited in extent and highly impoverished with a low diversity of species. The mudflat in the study area is therefore considered to be of low ecological value (paragraph 10.4.20 and 10.4.21 of the ES [APP-031]). Consideration of the importance and condition of this BAP priority habitat has been made when undertaking the marine ecology assessment (see Section 10.6 of the ES [APP-031]). Any loss of habitat will be temporary	The MMO's Concerns regarding the successful undertaking of this survey have been detailed in Row 1 of Section 5 of this document, and the Written Representations submitted to PINS on 15 December 2016. The MMO noted that the installation of the jetty is temporary and that any loss of priority habitat, as defined by the Natural Environment and Rural Communities Act 2006, will be temporary in nature. Mudflat habitat is considered highly recoverable, and there is not	

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	2006, Section 61.	and the overall impact has been assessed as Negligible, and therefore no mitigation is required. It is noted that the Environment Agency RR (SL/2016/115920/01-L02) states: *We are pleased to note that the proposed jetty will be temporary. If plans change and a permanent jetty is proposed, the applicant will need to make an assessment of the long term biodiversity impacts and if necessary, propose suitable mitigation.*	anticipated to be any permanent loss of mudflat habitat from the works.	
5.4.3	**Impacts from dredging** activities The MMO advised that the impacts from dredging should be considered in the	The level of detail with regard to dredging area, depth, dredging method as set out in section 10.6 of Chapter 10 Marine Ecology (Document Reference 6.10).	The MMO note that paragraph 10.6.46 states that the maximum footprint of the dredge area is 27,200m2 , and a lowering of depth by 3m. Therefore it is	

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	assessment including any assumptions made with regard to volume of dredged material, method of dredging throughout the assessment process. (Section 42 response letter dated 12th November 2015)		anticipated that the total dredge quantity is 81,000m3, however this quantity doesn't take into account for any sloping edges of the dredge pocket to prevent slumping. It is noted that any maintenance dredge requirements will be undertaken by water injection dredging, and exact quantities required are not known.	
5.4.4	**Coastal Processes** The MMO in their written representation dated the 15th November noted that the modelling used for suspended sediment transport did not consider	The modelling work presented in the ES Appendix 16.B Hydrodynamic Modelling (APP-078) used the survey data from December 2015 in order to allow sufficient time to undertake the modelling prior to submission of the Application. It is considered that the approach used	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	the worst case scenario. It was based on the surface sediments collected during December 2015, rather than the more consolidated clays collected during January 2016. A higher percentage contribution of fines from the sediment to be dredged needs to be considered for the modelling. The worst case scenario is to consider the total amount of sediment fines to be dispersed and contributed as a plume in the water column.	to be appropriate and indicative of the worst case scenario for the following reasons. The proposed dredge depth is approximately 3m. The January site investigation information referenced in section 5.3 of the Hydrodynamic Modelling report indicates that the majority of this depth will comprise of the consolidated clay, rather than loose sediment. At sites VIB 01, 03, 05, and 06 the surface sediment layer was between 0.13 and 0.25m deep and consisted of gravelly sand. Below this depth was brown clay which was sufficiently consolidated to enable sampling (unlike the soft sediment above). Therefore an assumption of a slightly clayey (2% clay) sand has been made. This is based on the		

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		Particle Size Distribution (PSD) testing results in the December 2015 investigation from a sample taken from within the dredge zone, and therefore which represents the unconsolidated sediment in the location of interest. The samples tested in the January 2016 investigation for PSD were taken from consolidated clay, rather than the unconsolidated loose sediment and therefore are not as representative of the material mass with greatest potential to be released into the water column as a result of dredging. The preferred dredging method is by a backhoe excavator (as stated in Section 10.6.81 of the ES [APP-031, as updated for Deadline 1: REP1-109]) which in consolidated or semi-consolidated clay will tend to limit		

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		the volume of material released into the water column because the clay remains in clumps, as opposed to loose fine grained material susceptible to being held in suspension. Therefore, if the model were to be run again using the January data, changing the model to account for a greater percentage of fine sediments, it would also have to account for the reduced mass released from the dredging due to the consolidated nature of the materials. The results of the calculations of potential concentrations in the dissolved phase are significantly (between 4 and 7) below the Environmental Quality Standard (EQS), as set out in 16.4.31 of the		

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		ES [APP-031, as updated for Deadline 1: REP1-109]. It is therefore unlikely that remodelling would lead to a different conclusion. It is considered that the small amount of fine sediment released during dredging of the consolidated layer will be dispersed by the currents in the dredge area and is therefore unlikely to have a notable effect on the water quality.		
5.4.5	**Coastal Processes** The MMO in their written representation dated the 15th November 2016 noted that the cumulative effects of the scheme with other developments nearby (e.g. the redevelopment of the Learmouth Peninsular	The cumulative assessment considered other nearby developments are set out in Appendix 17A of the ES [APP-031]. In general, the schemes assessed proposed very limited works within the river. Those that do and are assessed within the cumulative assessment include :	The MMO note the clarification provided and will provide further comment on the suitability when Cefas have been consulted.	

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	adjacent to Bow Creek and the redevelopment at the Greenwich Peninsula) with regards to sediment transport needs to be considered.	• Leamouth Peninsula North – a pedestrian bridge • Wharves, Pelton Road, Greenwich – landscaping of river wall • Coal Jetty & part of the River Thames, Peninsula Riverside, Greenwich – refurbishment of jetty • Land at Enderby Wharf (Former Alcatel Site) Christchurch Way – new jetty, improvements to river wall, dredging, piling, pontoon etc. Construction of the Scheme over a four year period will overlap with other development schemes which include in-river works. These developments have the potential to contribute to a cumulative impact as		

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		they includes improvements to the river wall, new ferry jetty terminal, new riverbus terminal, and demolition and construction of a new jetty. These projects are only expected to result in highly localised habitat loss and temporary changes to water quality. The spatial extent of these impacts would be expected to be restricted to within the immediate vicinity of the developments. In addition, habitats in the area are already generally modified through regular physical disturbance and are typically of low conservation value. Therefore, only negligible cumulative impacts on benthic habitats and species are expected. Any increase in suspended sediment load from the developments has been predicted to become assimilated in to the already turbid		

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		tidal Thames. Trace metal and trace organic concentrations were broadly in line with those reported for this section of the tidal Thames. Given the localised nature of the effects of construction at each site, and the relative distances, it is unlikely that any bioaccumulative impacts may occur. The local benthic ecology was found to be typical for the tidal Thames at these localities. Relatively low species numbers and transitory fish populations. Underwater noise during construction may cause some temporary avoidance by fish species, however, the short duration and the likely phasing of the construction activities for the river works would suggest that it is unlikely that cumulative impacts would result.		

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5.4.6	**Overall assessment and findings** The overall assessment and findings of the likely effects of the Scheme and the conclusions reached within Chapter 10 Marine Ecology (Document Reference 6.1).		The MMO would like to hold off formally informing PINS that this point is under agreement until final clarification has been undertaken with advisors.	
5.5 Deemed Marine Licence (DML)				
5.5.1	**Conditions included in the DML** The MMO suggested conditions to be included in the DML within the Section 42 response letter dated 12th November 2015 and email correspondence dated 12 August 2016.	TFL have provided MMO (email dated 24th August 2016) with revised wording regarding inclusion of a requirement for a construction method statement to be submitted.	TA revised DML was submitted at deadline 1[REP1-095]. TfL and MMO will continue to discuss any further comments. The MMO have sought out the newest version of the DCO on the PINS website, but it is considered to be the version from the date of	Email 8th and 24 August 2016. The MMO have offered advice regarding the wording of a condition requiring a method statement in row 2 of the DML section of the SoCG held within this

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			formal submission; no changes to the DML are apparent. As such it is not possible to discuss the content of the revised DCO at this time.	document.

6. Matters not agreed

6.1.1 There are no elements of the topics identified within Section 2 of this SoCG that are not agreed.

7. Agreement

Signed	
Name	
Position	
Company	Transport for London
Date	
Signed	
Name	
Position	
Company	Marine Management Organisation
Date	