national highways

Lower Thames Crossing

Minor refinement consultation

May 2023

National Highways

We are a Government-owned company that works with the Department for Transport.

Previously known as Highways England, our new name reflects our focus on delivering the Government's strategic roads investment programme, while also continuing to set highways standards across the UK.

We plan, operate, maintain and improve England's strategic road network, which plays a key role in connecting the country's regions, ports and international trade corridors.

Our aim is to ensure that road users have safer and more reliable journeys, and that businesses have the high-quality, effective road links they need to prosper.

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1 Foreword

Matt Palmer, Lower Thames Crossing Executive Director

Since we last consulted on the Lower Thames Crossing plans in May last year, I'm delighted to report we have submitted our Development Consent Order (DCO) Application, which has been accepted for examination by the government's Planning Inspectorate.

This is an important stage in the development of the Lower Thames Crossing, which will be vital in tackling the daily delays and frustration caused by congestion at the Dartford Crossing and in unlocking the true potential of the Thames Estuary. We've now appointed our construction partner for the roads north of the River Thames and we'll be announcing our partners to build the tunnels and roads in Kent in the months ahead.

The government recently set out its continued support for the Lower Thames Crossing while also announcing an intention to rephase construction by 2 years. We do not expect this to have an impact on the DCO process with the six-month examination due to start in June 2023.

I'm grateful to everyone who has submitted a Relevant Representation to the Planning Inspectorate to express their views on our proposals. We are now proposing a handful of minor amendments to our plans. These changes will also result in a small reduction in the land we need to build and operate the road.

While very limited in scope and impact we want to put forward these changes now so that we can get your feedback in order to help us determine whether to apply to the Planning Inspectorate to include them in our plans and if so, to ensure they can be given due scrutiny during the examination process.

Thank you once again for your valuable contribution to the development of our plans. Through that input we have made great strides in planning the greenest road ever to be built in the UK, which will connect communities, enhance nature and provide new ways to build infrastructure in a net zero future.

Matt Palmer

Lower Thames Crossing Executive Director

National Highways

2 Introduction to the minor refinement consultation

What is the Lower Thames Crossing?

National Highways is proposing a new road and tunnel, the A122 Lower Thames Crossing. It would connect to the A2 and M2 in Kent, passing through a tunnel under the River Thames, before linking to the A13 in Thurrock and junction 29 of the M25 in the London Borough of Havering, north of the Thames.

It would be approximately 23km long, with 4.25km of this in tunnels under the Thames. The tunnels would be located to the east of the village of Chalk on the south side of the Thames, and to the west of East Tilbury on the north side.

Minor refinement consultation

We're holding this minor refinement consultation to seek your feedback on a small number of minor changes we are proposing to make to our Development Consent Order (DCO) Application. These are localised in nature and small in extent, with only minimal change to the impacts which we reported in our DCO Application. We have highlighted any change in those impacts within this booklet.

Chapter 3 of this booklet sets out the changes we are seeking your feedback on as part of this consultation. Starting from south to north these are:

- Reduction of Nitrogen Deposition compensation area and Order Limits at Blue Bell Hill and Burham (MRC01) – page 6
- Increase in limits of deviation (LOD) for the northern tunnel entrance headwall (MRC02) – page 12
- Revised utility proposals at East Tilbury (MRC03) (three changes) – page 19

Chapter 4 provides a construction update, setting out how the tunnels beneath the River Thames could be constructed by either two tunnel boring machines, or by using a single tunnel boring machine to construct both.

We have further reduced the Order Limits to reflect the changes we are proposing in Chapter 3.

Pre-examination

We submitted our DCO Application to the Planning Inspectorate on 31 October 2022 to secure consent to construct and operate the A122 Lower Thames Crossing (the Project). Our Application was accepted for Examination on 28 November 2022. The Application and how to engage in the DCO process can be found using this link: https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing/

A panel of five independent Inspectors has been appointed as the Examining Authority to examine our Application on behalf of the Secretary of State for Transport. They will review the evidence submitted and listen to issues raised.

Through this consultation, we want to let you know about the proposed changes and provide an opportunity for feedback to be given in relation to them. We will consider all responses before submitting any request to the Examining Authority to incorporate these changes into the DCO examination process.

If these changes are accepted by the Examining Authority, they will be considered during the examination of the DCO Application.

https://nationalhighways.co.uk/our-roads/lower-thames-crossing/

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3 Proposed changes since our DCO Application

The proposed changes described in this chapter are as a result of ongoing engagement with landowners and other stakeholders, and further design refinement.

In addition to the summary of impacts included in each change description we have also included a more detailed summary of environmental effects and how these differ from the original environment assessments.

Throughout this chapter, we refer to the Lower Thames Crossing as 'LTC'.

Proposed Order Limits

The Order Limits are the outermost edges of the Project. They are indicated on the figures in this chapter by a red line. This shows the land that may be acquired or used to construct and operate the Project and the areas to which the DCO would apply. Land proposed to be removed from the Order Limits at this consultation is indicated by light orange shading.

The land within the revised Order Limits we are consulting on has reduced by 0.57km^2 from 23.94km^2 to 23.37km^2.

There is no change to the number of properties in the Order Limits as detailed in our DCO Application.

Please refer to Figure 3.1 on page 5 for further information.

Land use

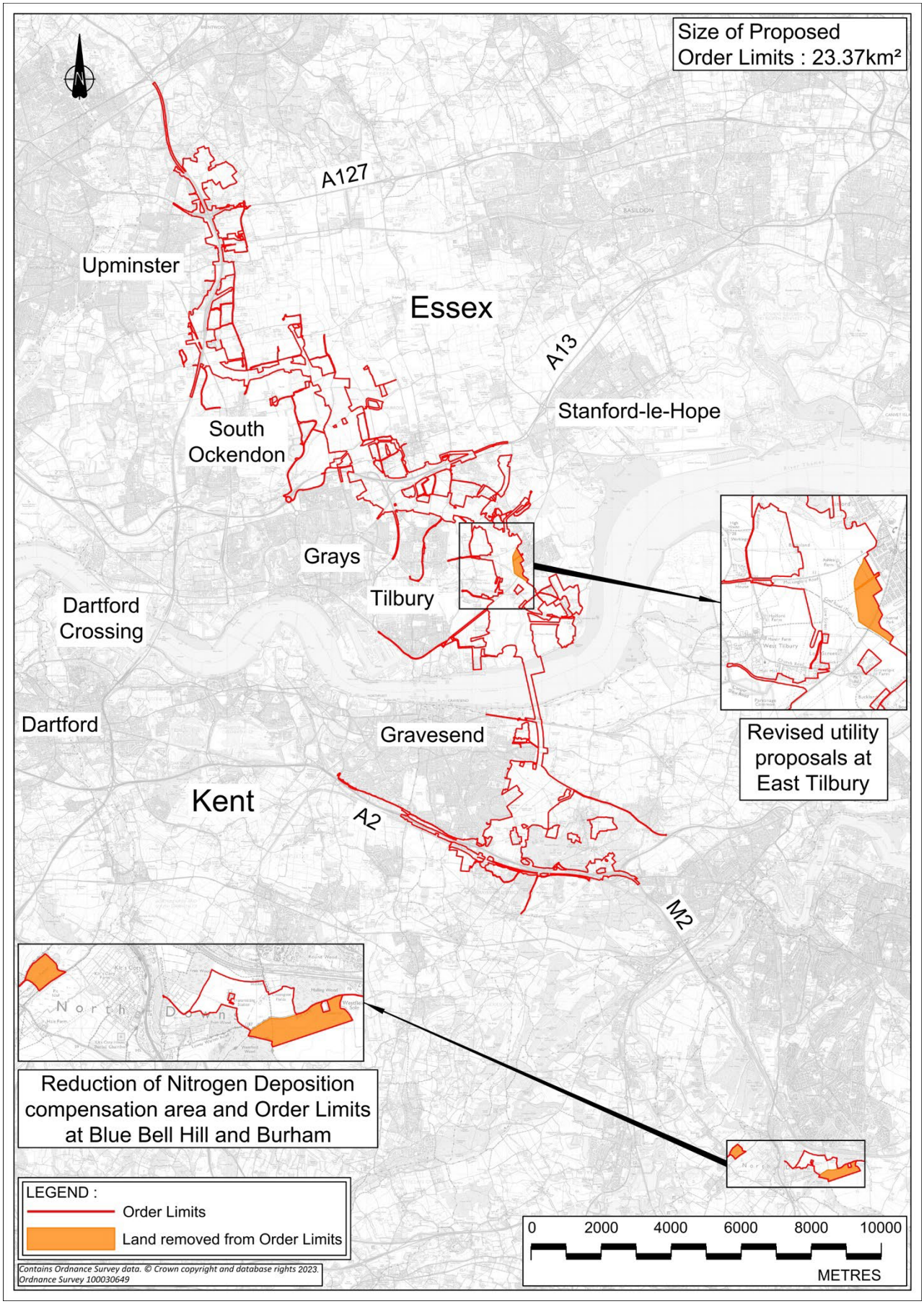
The land we need permanently to build and operate the LTC was 14.87km^2 and is now proposed to be 14.49km^2. This is indicated by pink shading on Figure 3.8 and Figure 3.9.

The land we need to use temporarily while we build the LTC was 4.20km^2 and is now proposed to be 4.01km^2. This is indicated by light green shading on Figure 3.8 and Figure 3.9.

The land we need to use temporarily and acquire permanent rights over to build and operate the LTC was 4.39km^2 and is now proposed to be 4.40km^2. This is indicated by light blue shading on Figure 3.8 and Figure 3.9.

As a result of the revised utility proposals at East Tilbury that are detailed later in this chapter, we propose to change our land use requirements in some areas from land we use temporarily to land that is used temporarily with permanently acquired rights. In other areas we will remove from the Order Limits areas of land identified to be used temporarily with permanently acquired rights.

Figure 3.1 Proposed Order Limits at the minor refinement consultation

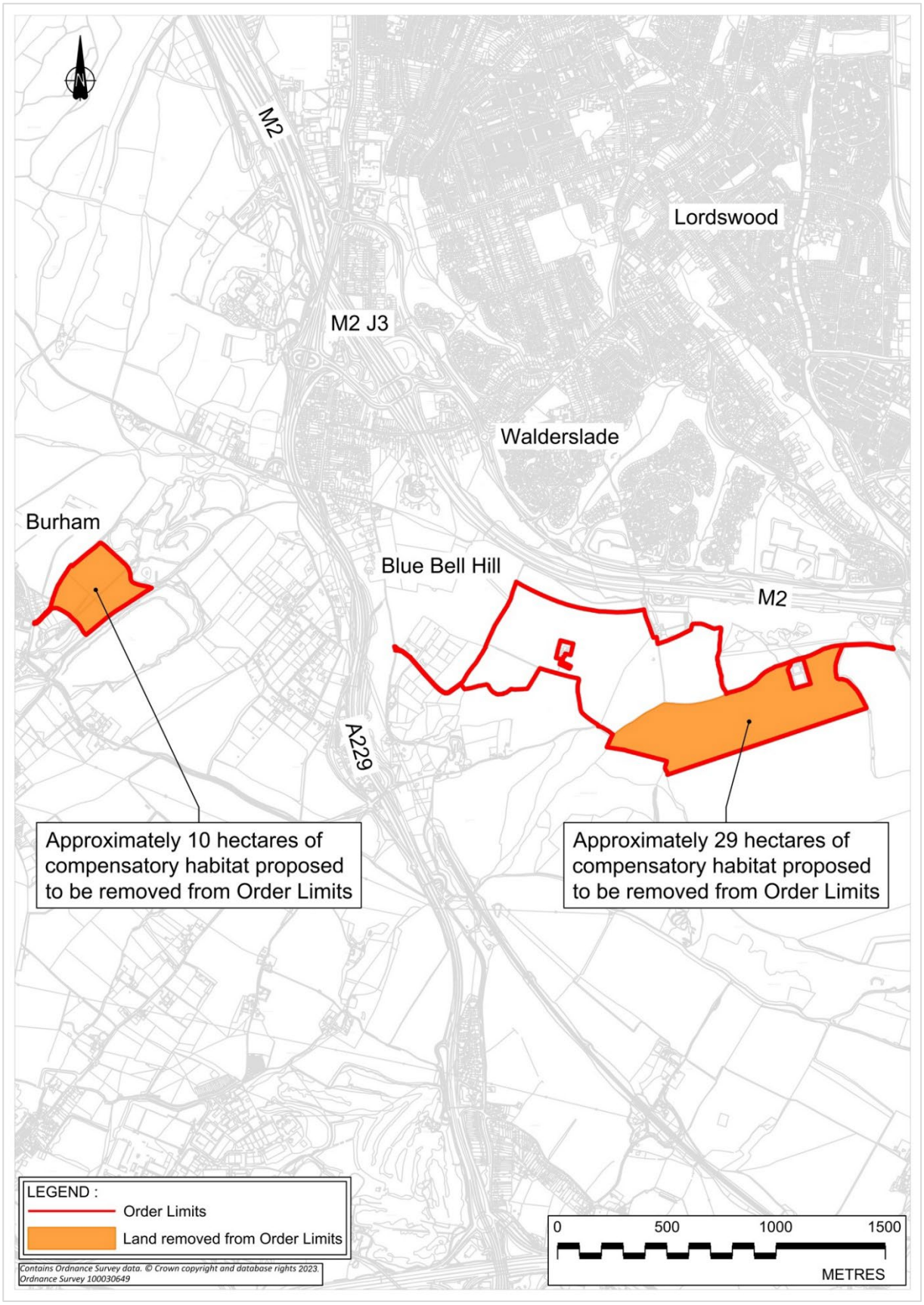


Reduction of nitrogen deposition compensation area and Order Limits at Blue Bell Hill and Burham

Description of the location of the change	The Blue Bell Hill site is located to the south of the M2, between junctions 3 and 4 in Kent just north of Maidstone. The site lies between the Wouldham to Detling site of special scientific interest (SSSI) to the south-west and Malling Wood ancient woodland to the north-east. The site is within the Kent Downs area of outstanding natural beauty (AONB) The Burham site is located to the east of the village of Burham and borders the Wouldham to Detling SSSI to the south and east.
Lower Thames Crossing proposals	In the local refinement consultation, we first set out the work we are doing to address the potential effects to nearby habitats of nitrogen deposition from traffic using the LTC. This included our proposals to provide approximately 250 hectares (ha) of compensatory habitat. We consulted on the provision of 279ha with the intention to reduce this figure in the DCO Application. We did this and our DCO Application provides 245ha of compensatory habitat, which is detailed in the Project Air Quality Action Plan. Ongoing engagement with the landowner of the Blue Bell Hill and Burham sites has highlighted new information including the implications of our proposals on the farm business and a newly agreed Countryside Stewardship scheme (in place across much of the farm). The Stewardship scheme focuses on strengthening hedgerow planting and providing greater borders to field margins. This new information regarding a Countryside Stewardship means that an increased ecological connectivity would be realised by the Stewardship scheme beyond that assumed in our assessment and so the additional connectivity benefits of our previous proposals would be much reduced. It is therefore proposed to remove the Burham site (approximately 10ha) from the Order Limits, which was added after the local refinement consultation and provides less ecological benefit than the retained land. It is also proposed to reduce the Blue Bell Hill site by 29ha leaving approximately 43ha within the Order Limits as nitrogen deposition compensation land. The retained land would be the land which maximises the ecological connectivity. Therefore even with the reduction the site meets the function of the compensation land. The overall amount of compensatory habitat is now 205ha.

Impact of the change	The change would reduce the impact on agricultural land. The two key objectives of providing additional ecological connectivity in the habitat network and providing a comparable area of compensation to the area of significantly affected habitat overall would still be achieved. The smaller site would still connect the same existing woodlands and the overall area of compensation would be comparable. The change reduces the impact on the farm business and the loss of productive agricultural land. This change would remove the impact on a cultural heritage asset: the below-ground remains of Great Culand, a former medieval to modern manor and farmstead. The significant beneficial visual effect of new woodland habitat when viewed from a footpath at Blue Bell Hill would be reduced by the reduction in planting caused by the removal of this site. We have set out further details on any impacts of this change on our environmental assessments in the table on page 9. Please refer to Figure 3.2 on page 8 for more information.

Figure 3.2 Reduction of nitrogen deposition compensation area and Order Limits at Blue Bell Hill and Burham



Environmental assessment of reduction of nitrogen deposition compensation area and Order Limits at Blue Bell Hill and Burham

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Air Quality	The Blue Bell Hill and Burham compensation sites were identified as a means of compensating for the effects of nitrogen deposition on ecologically designated sites across the air quality study area caused by the forecast increase in traffic as a result of LTC.	No new or different significant air quality effects anticipated either during construction or operation.
Cultural Heritage	The archaeological asset 'Great Culand, former Medieval to Modern manor and farmstead' (asset 4745) is located within the land at the Burham site. This is currently assessed to experience a moderate adverse impact and a permanent moderate adverse effect, which is significant, as a result of the planting that had been proposed.	The proposed change would remove the moderate adverse impact and effect to asset 4745, removing a significant effect reported in the ES. No other change is anticipated in relation to heritage assets either during construction or operation.
Landscape and Visual	Blue Bell Hill site: A significant beneficial visual effect is reported in Appendix 7.10 of the ES (APP-385) for footpath KH31 and adjacent residential properties along a farm access track off Bell Lane and from footpath KH31, KH30 and the North Downs Way (Representative Viewpoints N-Dep-RV-07 and N-Dep-RV-08). A significant beneficial landscape effect is reported in Appendix 7.9 of the ES (APP-384) on the Mid Kent Downs (sub area Bredhurst) Local Landscape Character Area (LLCA).	No new or different significant adverse effects anticipated in relation to both sites either during construction or operation. The beneficial visual effect from nitrogen deposition at representative viewpoint N-Dep-RV-08 is no longer considered significant due to the proposed reduction in the area of new woodland habitat and therefore the extent of change to the existing view during operation.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
	Burham site: No significant visual effects are reported in Appendix 7.10 (APP-385) of the ES for Representative Viewpoints N-Dep-RV-05 and N-Dep-RV-06. No significant landscape effects are reported in Appendix 7.9 of the ES (APP-384) on Medway Valley (sub area The Eastern Scarp) LLCA.	The significant beneficial landscape effect on the Mid Kent Downs (sub area Bredhurst) LLCA experienced during operation would remain due to the substantial area of proposed new woodland habitat remaining in the reduced Order Limits.
Terrestrial and Marine Biodiversity	A significant adverse effect from nitrogen deposition is reported across the affected road network for which the Burham and Blue Bell Hill sites were proposed as compensation habitat creation. Ecological effects on habitats and the two species considered (badgers and great crested newts) on the Burham and Blue Bell Hill sites are not significant.	No new or different significant effects are anticipated either during operation or construction. There would be a reduction in the overall extent of habitat creation, but the total area of nitrogen deposition compensation provided is still considered to result in effective compensation for these adverse impacts of the Project.
Geology and Soils	A significant adverse effect was reported due to the Project's impact on best and most versatile land. The results of the survey are reported in Appendix 10.4 of the ES (APP-425). The Agricultural Land Classification at Burham determined the soils to be grade 2 (9.5ha), whilst land at Blue Bell Hill was predominantly grade 3a (approximately 21ha) with a small section (approximately 7ha) assigned grade 3b.	No new or different significant effects anticipated either during construction or operation. The removal of the Burham site and reduction of the Blue Bell Hill nitrogen compensation sites would result in the removal of approximately 30ha of best and most versatile land from the Order Limits, which would be beneficial but would not result in a change to the overall conclusions in relation to the Project's impact on best and most versatile land presented in the ES.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Material Assets and Waste	The ES identified a significant adverse effect arising from the Project's impact on landfill capacity in the study area.	There are no new or different significant effects anticipated either during construction or operation. For the purpose of assessment, it was assumed that there would be no waste generating activities/earthworks associated with the laying out of these sites as compensatory habitat.
Noise and Vibration	There were no significant effects reported within the locality of this change during construction or operation.	There would be no new noise-generating activities during construction and no change to the noise environment in operation at this location. Therefore, this would not give rise to any new or different significant noise effects.
Population and Human Health	No significant adverse effects were reported in relation to works at these sites during construction and operation.	The proposed reduction of the Order Limits would not result in any new or different significant effects during construction or operation.
Road Drainage and the Water Environment	There are no significant effects for construction or operation reported in the ES.	The proposed reduction of the Order Limits would not result in any new or different significant effects during construction or operation.
Climate	There are no significant effects for construction or operation reported in the ES.	The change would result in a very small increase in reported greenhouse gas emissions (due to the removal of the land use change benefit reported in the DCO Application). The proposed reduction of the Order Limits would not result in any new or different significant effects during construction or operation.

Increase in limits of deviation (LOD) for the northern tunnel entrance headwall

This is a minor change in how we would build part of the northern tunnel entrance, and as such there is some terminology that is helpful to explain.

Limits of deviation

LOD represent the permitted limits within which a structure may be built. They provide a limited degree of flexibility for contractors when building projects.

Cut and cover

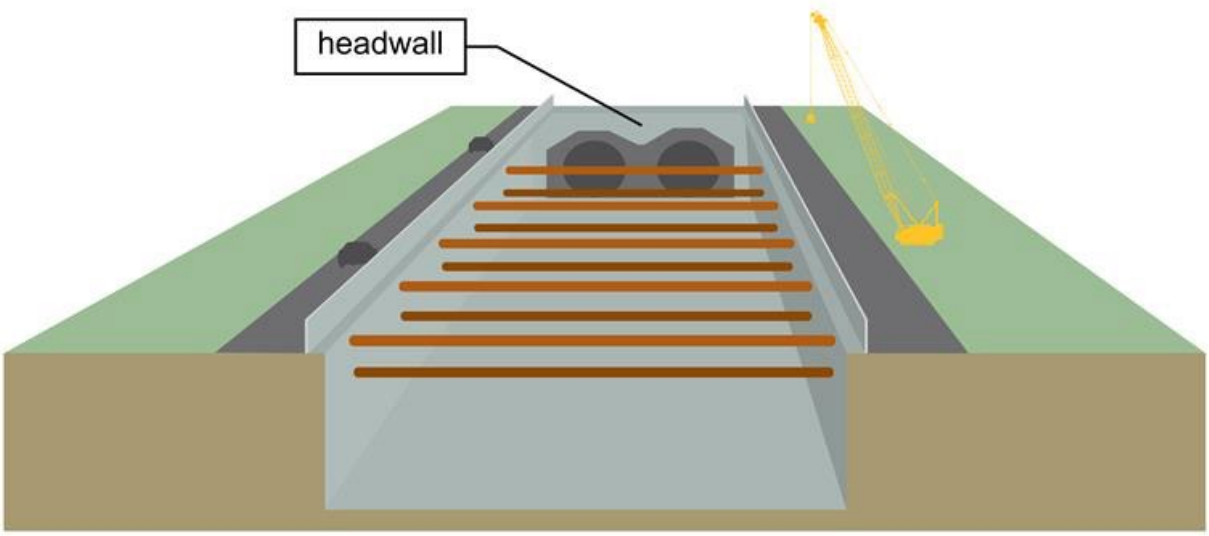
A cut and cover technique in this instance is where a large open excavation is formed, a tunnel is built within the excavation, and the excavated material is then filled in so that the tunnel becomes buried below ground level.

Headwall

The headwall is the structure which contains the holes through which the tunnel boring machine (TBM) is launched and buried into the ground. It is a reinforced concrete wall designed to retain the ground whilst also allowing a hole to be bored through it. It acts as the interface between the bored tunnel and the cut and cover section of the tunnel prior to the road passing out into the open air at the tunnel entrance.

Please see Figure 3.3 for an illustration of a headwall.

Figure 3.3 A tunnel headwall illustration



Description of the location of the change	The northern tunnel entrance is located north of the River Thames, west of East Tilbury.
Lower Thames Crossing proposals	To allow for a greater area in which to construct the northern tunnel entrance headwall we propose a change to the current LOD between the tunnel and the cut and cover structure. This would allow the contractor appointed to build the tunnels to do so in a more efficient way. The location within which the cut and cover tunnel structure begins would not change. There would be no change to the current LOD in the location of the northern tunnel entrance. The LOD in the DCO Application are shown in Figure 3.4 on page 14 and the LOD in this consultation are shown in Figure 3.5. Both relate to the potential location of the headwall. This proposal would increase the LOD of the headwall from 125m in our DCO Application by a further 150m to give a total LOD of up to 275m.
Impact of the change	The proposed increase in the LOD for the northern tunnel entrance headwall would affect the location in which the tunnel transitions to the cut and cover structure within the tunnel itself. Benefits of this change would include a reduction in the amount of material required for construction and the volume of excavated material. There would be no change to the proposed LOD for the tunnel service building (125m to the north) set out in the DCO Application as a result of this change. There would be no difference to visual impacts as a result of this change, as all work would be within the tunnel structure beneath the ground. There would be no change to the construction traffic assessment as presented in the Transport Assessment. We have set out further details on any impacts of this change on our environmental assessments in the table on page 16.

Figure 3.4 Limits of deviation (LOD) for the northern tunnel entrance headwall at DCO Application

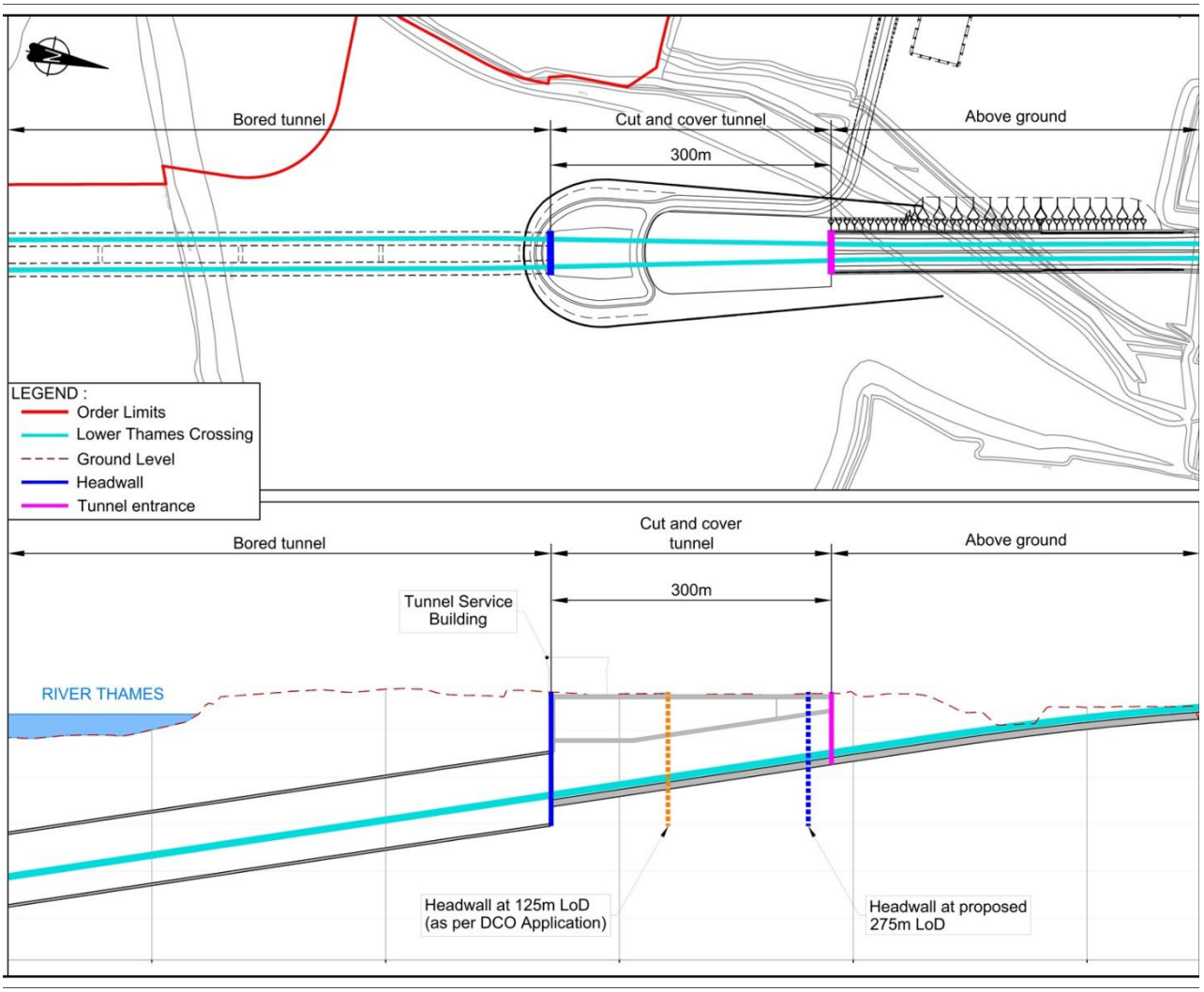
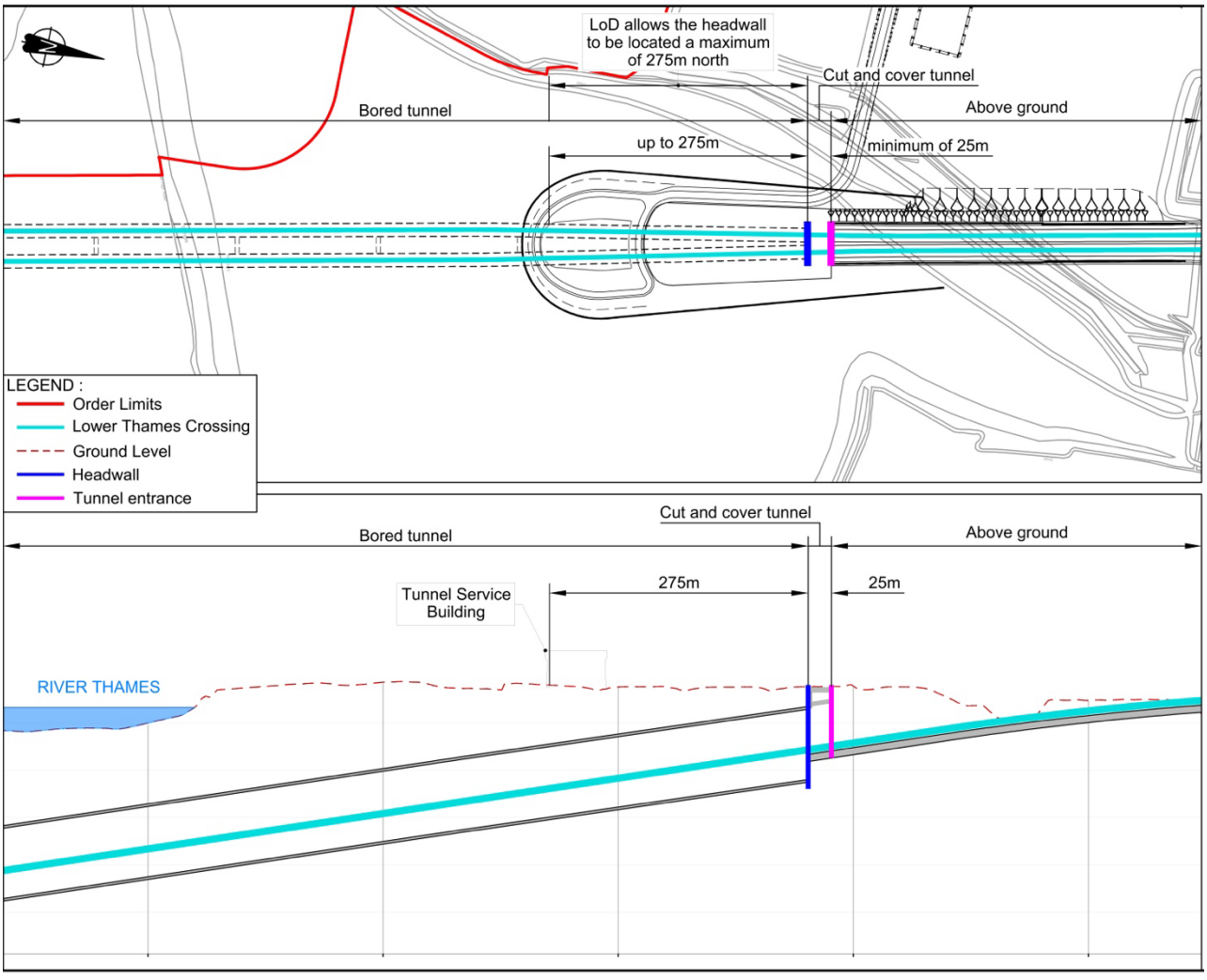


Figure 3.5 Limits of deviation (LOD) proposed for the northern tunnel entrance headwall at minor refinement consultation



Construction related environmental assessment of increase in limits of deviation (LOD) for the northern tunnel headwall

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Air Quality	No significant air quality effects are predicted in the area around the northern tunnel headwall.	The proposed changes do not move the location of the northern tunnel entrance headwall or the footprint of LTC closer to any residential or other sensitive areas. Therefore, there is no change in the significant effects.
Cultural Heritage	A number of significant adverse effects to archaeological assets have been reported in Chapter 6 of the ES (AS-044) in relation to works comprising the construction of the northern tunnel entrance headwall and the cut and cover works (see Section 6.6: Assessment of likely significant effects).	The proposed changes do not move the location of the northern tunnel entrance headwall or the footprint of LTC. Therefore, there is no change in the significant effects.
Landscape and Visual	The landscape and visual effects of the northern tunnel entrance headwall and associated Project features are reported in Chapter 7 of the ES (APP-145) (see Section 7.6: Assessment of likely significant effects), significant adverse landscape effects are presented in the assessment in association with the works comprising the northern tunnel entrance headwall.	The proposed changes do not move the location of the northern tunnel entrance headwall or the footprint of LTC. Therefore, there is no change in the significant effects.
Terrestrial and Marine Biodiversity	A number of significant adverse effects have been reported in Chapter 8 of the ES (APP-146) in relation to the works comprising the construction of the northern tunnel entrance headwall, notably around direct habitat loss, and visual and noise disturbance.	The proposed changes do not move the location of the northern tunnel entrance headwall or the footprint of LTC. Therefore, there is no change in the significant effects.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Geology and Soils	No significant adverse effects have been reported in relation to the construction of the northern tunnel entrance headwall location for geology or contamination. A significant effect has been reported for the Project's impacts to best and most versatile land.	The proposed changes do not move the location of the northern tunnel entrance headwall or the footprint of LTC. Therefore, there is no change in the significant effects (including the impact on best and most versatile land). The measures set out in the Register of Environmental Actions and Commitments (REAC) (APP-336) to control potential contamination effects at the northern tunnel entrance headwall construction and tunnelling activities would continue to apply and would not change as a result of moving the headwall.
Material Assets and Waste	A significant adverse effect has been reported in relation to the Project's impact on landfill capacity in the study area.	No new or different significant effects are anticipated. There would be a minor reduction in material use associated with this change. There would also be a minor reduction in construction waste generated and material excavated during construction. However, these changes do not affect the overall conclusions reported in Chapter 11 of the ES (APP-149).
Noise and Vibration	There are no significant noise effects reported within the locality of this change.	No new or different significant noise effects are anticipated, as construction activities will not be moving closer to sensitive receptors.
Population and Human Health	There are no significant effects reported within the locality of this change.	No new or different significant effects are anticipated.
Road Drainage and the Water Environment	There are no significant effects reported.	No new or different significant effects are anticipated.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Climate	There are no significant effects reported.	The change will have a negligible effect on resilience of the project to climate change and on the amount of carbon generated in the construction phase of LTC. Therefore, no new or different significant effects are anticipated.

Revised utility proposals at East Tilbury

These are a package of three changes that present an opportunity to reduce the amount of land required for construction with a corresponding reduction in the Order Limits and movement of construction works further away from residential areas. Map references 1, 2, 3 and 4 on Figure 3.6, Figure 3.7, Figure 3.8 and Figure 3.9 help to explain these proposals.

Change title	Temporary Linford water pipeline alignment including relocation of the Muckingford Road Utility Logistics Hub (ULH).
Description of the location of the change	East of the proposed LTC between the Tilbury Loop railway line and Muckingford Road.
Lower Thames Crossing proposals	Following stakeholder engagement we have identified an opportunity to reduce the amount of land required to install the temporary Linford water pipeline and the relocation of Muckingford Road ULH. The temporary Linford water pipeline would be used to supply water to the tunnel boring machine(s) used in constructing the tunnels for the LTC. Our proposal is to move the pipeline up to 250m west but remain on the eastern side of the LTC. Muckingford Road ULH would move 350m west to the western side of the LTC, east of Low Street Lane and north of the Coal Road bridleway.
Impact of the change	Approximately 17ha of land is proposed to be removed from the Order Limits along the eastern extent of these works. There would need to be a change in land use as detailed in the land use – west of Linford proposal on page 20. The change in land use proposal is required in order to enable the acquisition of rights associated with the installation, operation and maintenance of the temporary Linford water pipeline in its proposed new location. The revised proposal would also relocate the Muckingford Road ULH, however it would still be accessed via Muckingford Road and therefore there would be no changes to the forecast construction traffic movements as assessed in the Transport Assessment that accompanies the DCO Application. The relocated Muckingford Road ULH would be further away from the residential area of Linford which would reduce potential environmental impacts such as dust emissions and construction noise. Further information can be found on page 26.

	Map reference 1 on Figure 3.6 and Figure 3.7 on pages 22 and 23 indicate the previous and proposed route of the temporary Linford water pipeline and the Muckingford Road ULH. Map references 3 and 4 on Figure 3.8 and Figure 3.9 on pages 24 and 25 show the previous and proposed changes to land use.

Change title	Relocation of Low Street Lane ULH.
Description of the location of the change	West of the proposed LTC between the Tilbury Loop railway line and Muckingford Road.
Lower Thames Crossing proposals	In conjunction with the other proposed changes in this area, we propose to co-locate the Low Street Lane ULH with Muckingford Road ULH which would enable a 10% reduction in the total size of the ULHs from 2ha to 1.8ha. Therefore, the proposal is to relocate Low Street Lane ULH south of the relocated Muckingford Road ULH.
Impact of the change	Whilst this proposed change would result in the relocation of the Low Street Lane ULH, it would continue to be accessed via Muckingford Road and therefore there would be no changes to the forecast construction traffic movements as assessed in the Transport Assessment that accompanies the DCO Application. The relocated ULH would be further away from the residents of Low Street, which would reduce potential environmental impacts such as dust emissions and construction noise. This relocated ULH would be outside of the proposed Tilbury Flood Compensation Area, moving it north by approximately 550m, south of Coal Road east of Low Street Lane. There would be a minor adverse temporary impact on soils as a result of this change, further information can be found in the environmental assessment for these changes on page 26. Map reference 2 on Figure 3.6 and Figure 3.7 on pages 22 and 23 show the previous and proposed location of Low Street Lane ULH.

Change title	Land use change – west of Linford.
Description of the location of the change	East of the proposed LTC between the Tilbury Loop railway line and Muckingford Road.
Lower Thames Crossing proposals	Following a request from the utility owner, we propose to amend the land use for some of the agricultural land in this area associated with the operation and maintenance of the diverted overhead power lines. The land use will change from

	temporary possession (green land on Figure 3.8) to temporary possession and the permanent acquisition of rights (blue land on Figure 3.9) Figure 3.8 and Figure 3.9 on pages 24 and 25 show map reference 3 as the change of land use required for the overhead power lines. This is the same change in land use as that which is also required to enable the diversion of the temporary Linford water pipeline (as detailed on page 19). The change in proposed land use for the temporary Linford pipeline can be seen at map references 4.
Impact of the change	There are no new significant adverse environmental effects as a result of this change from those included in our DCO Environmental Statement. Further information can be found on page 26.

Figure 3.6 Utility proposals at East Tilbury at DCO Application

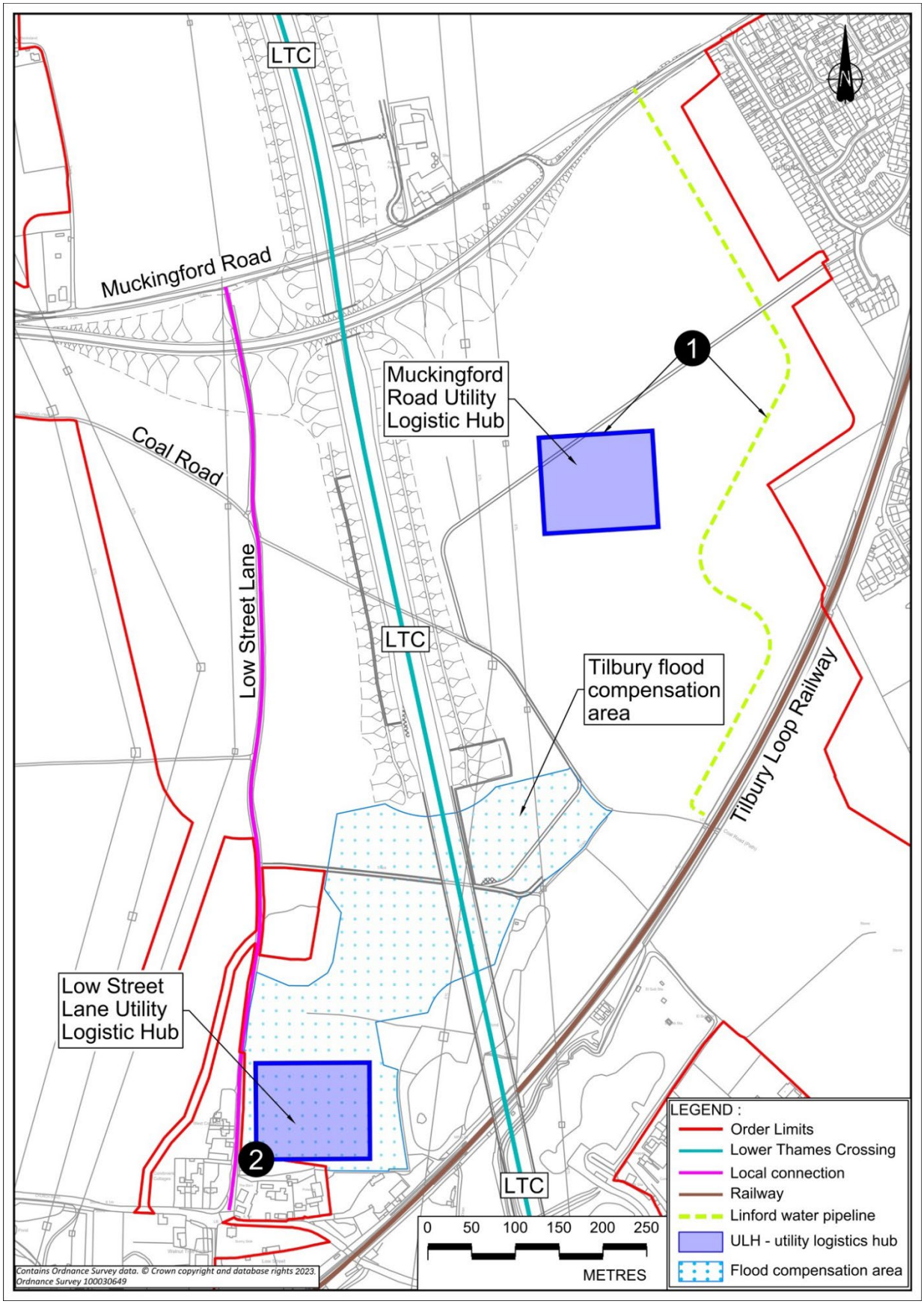


Figure 3.7 Revised utility proposals at East Tilbury at minor refinement consultation

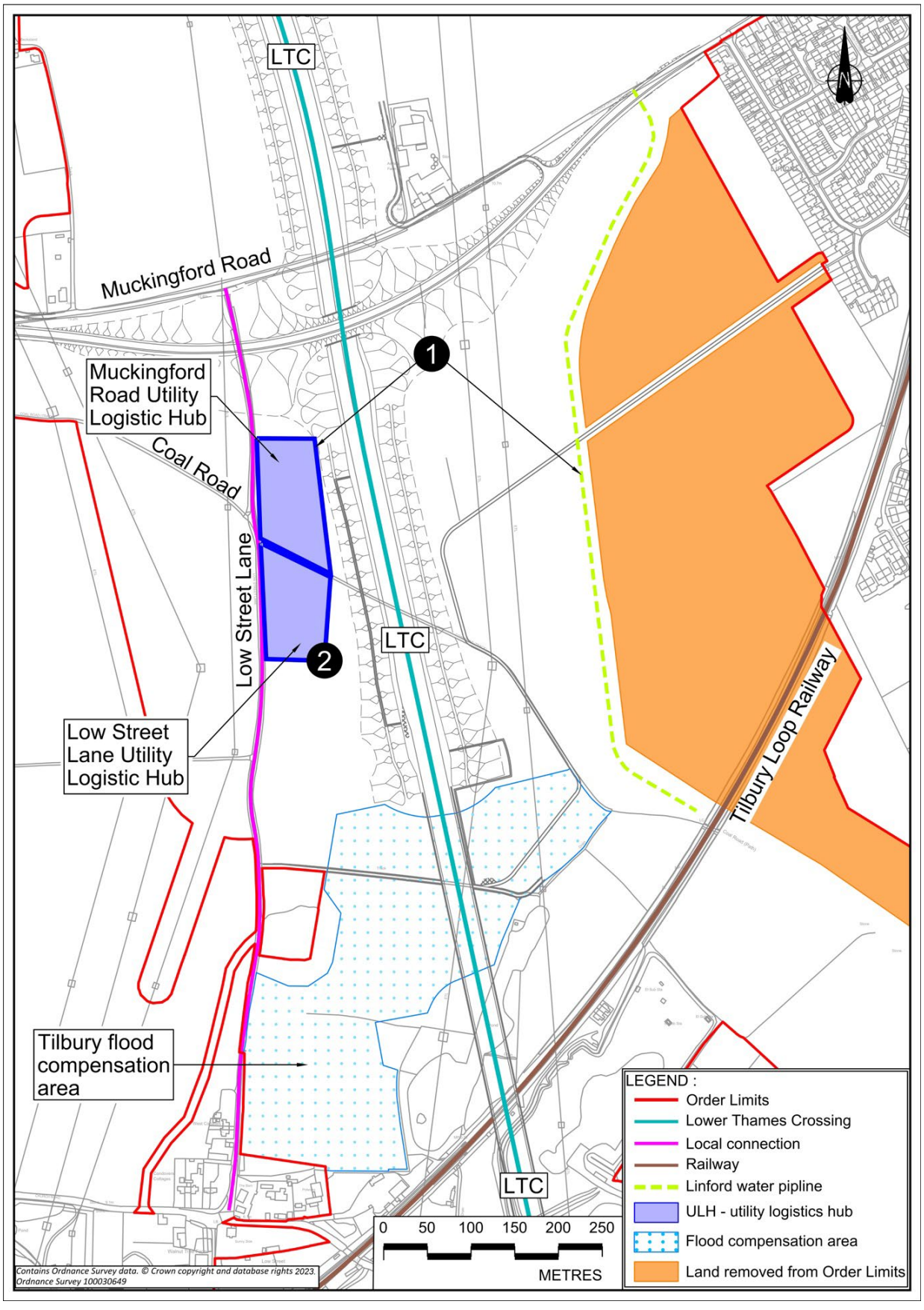


Figure 3.8 West of Linford land use at DCO Application

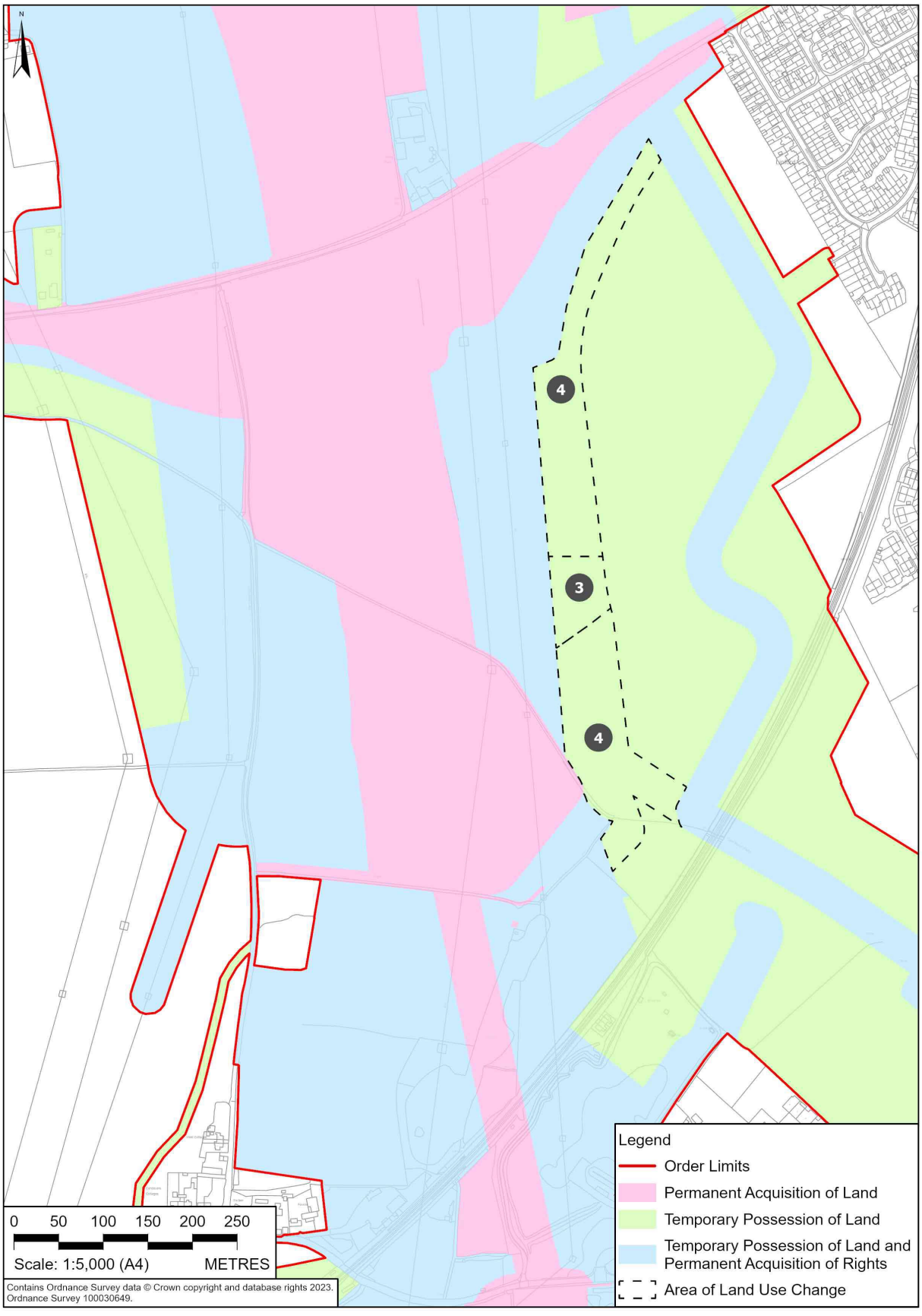
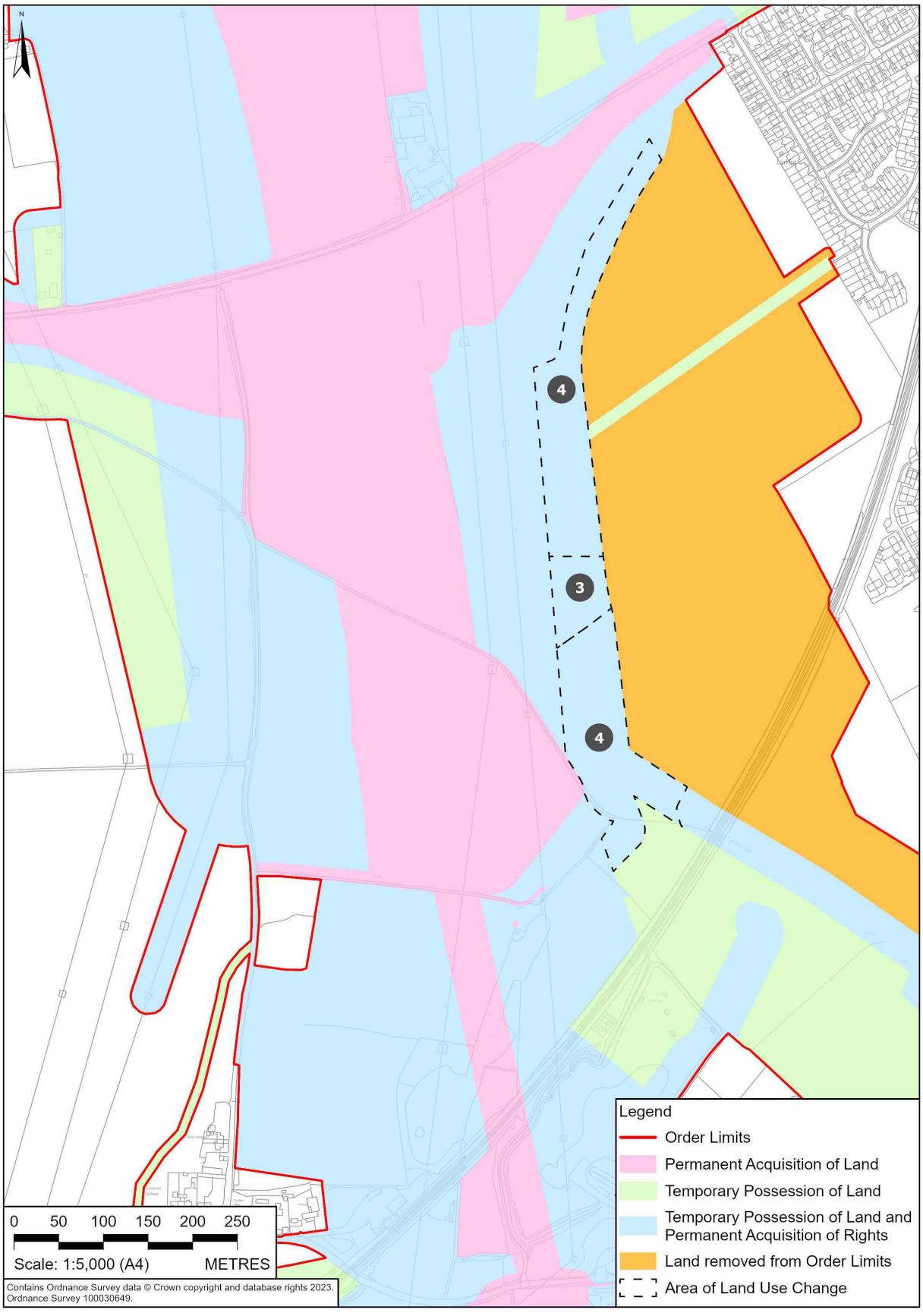


Figure 3.9 West of Linford land use at minor refinement consultation



Environmental assessment of revised utility proposals in East Tilbury

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Air Quality	There are no significant effects reported in terms of air quality during construction. Operational environmental effects on air quality are not relevant to these changes.	These changes move the alignment or position of underground utilities works and logistic hubs to areas that are further away from residents located within Linford and West Tilbury and would therefore serve to increase the distance between dust emission sources and these receptors during construction. No new or different significant effects are therefore anticipated during construction.
Cultural Heritage	While some significant effects on heritage assets are reported in the ES none are in close proximity to the land affected by this change and therefore no significant effects have been reported from the existing proposals.	No new or different significant effects are anticipated.
Landscape and Visual	The landscape and visual effects of utility works during construction are reported in Chapter 7 of the ES (APP-145). A significant adverse visual effect on views encompassing these works during construction is reported from residential properties in East Tilbury (off Beechcroft Avenue). A significant adverse visual effect during construction, including the Muckingford Road ULH and associated access track, is reported from residential properties in East Tilbury (off Beechcroft Avenue).	No new or different significant effects are anticipated in relation to the change in the alignment of the temporary water pipeline or reduction to the Order Limits because significant adverse visual effects during construction would remain from other utilities works and construction activities. The changes in the temporary Linford water pipeline would also not affect the operational visual assessment, due to the pipeline being located underground. The relocation of the ULHs would not result in new or different significant effects.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
	A significant overall adverse visual effect during construction, including the Low Street Lane ULH, is also reported from Low Street Lane adjacent to a cluster of residential properties.	Looking east towards the site of the proposed location for both ULHs on Coal Road, significant adverse effects during construction are already reported in Chapter 7 of the ES (APP-145) (large adverse effect) and whilst the relocated ULHs would introduce an additional construction feature, it would not change the overall level of assessment from these two representative viewpoints. From an operational perspective there would be no change in the assessment of significance reported in the ES.
Terrestrial and Marine Biodiversity	Significant adverse effects have been reported in Chapter 8 of the ES (APP-146) in relation to the construction of LTC, notably around direct habitat loss and visual and noise disturbance. East Tilbury, where these changes are proposed is not considered to have significant adverse effects on the habitat occurring at this location.	No new or different significant effects are anticipated. Habitat loss and disturbance would be reduced marginally but not to a level which would result in a change to the conclusions of significance in the assessment.
Geology and Soils	A significant adverse effect was reported during construction due to the impact of LTC on 'best and most versatile land'. This is agricultural land classified as grade 1, 2 or 3a across the whole project. The Agricultural Land Classification has predominantly characterised the soils as grade 3a, with pockets of grade 3b in the land directly south of	No new or different significant effects are anticipated during construction or operation as a result of the reduction in the Order Limits associated with the revised utility proposals. This change would result in the removal of approximately 17ha of grade 3a and 3b soils from the Order Limits which would be beneficial. However, this would not change the reported effects in the ES as the impact on best and most versatile soil is considered across the whole project.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
	Muckingford Road and directly to the east of Low Street Lane (in the current proposed location of Low Street Lane ULH). A small area of grade 2 land was also identified within the land south of Muckingford Road, which coincides with the alternative location of the ULH.	The alternative location for Low Street Lane ULH would move (0.4ha) from an area of grade 3b to grade 3a/grade 2, which would be an adverse impact, in terms of best and most versatile soil, but would not change the overall assessment of significance reported in the ES.
Material Assets and Waste	The ES identified a significant adverse effect arising from the Project's impact on landfill capacity in the study area.	There are no new or different significant effects anticipated. There would be no waste generating activities/earthworks associated with these works above and beyond what has already been reported.
Noise and Vibration	There are no significant effects reported within the locality of these changes.	These changes would move the construction works further away from the residential area located within Linford which would reduce the noise impact for a short phase of construction. However, in the context of the wider construction no new or different significant effects are anticipated. This design change would also move the ULHs further away from the residential area located within Linford and West Tilbury and would also reduce temporary noise impacts, although in the context of the construction assessment there would be no change to the overall assessment of significant effects. From an operational perspective there would be no change in the assessment of significance reported in the ES.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Population and Human Health	There are no significant effects for construction or operation reported in the vicinity of this change in ES. In relation to the area covered by the new location for the ULHs, the ES reports a slight adverse effect (which is not significant) during construction.	No new or different significant effects are anticipated. The proposed changes would not have an effect on the sensitivity of this land (which is low) and the significance of effect during construction is likely to remain slightly adverse as reported in the ES.
Road Drainage and the Water Environment	The layout and below ground construction and materials of the utility corridors in the vicinity of the Low Street irrigation reservoir have the potential to cause drainage from or reduced groundwater seepage to the reservoir, which is groundwater fed. The Project's commitment in the REAC Ref. RDWE054 as set out in chapter 7 of the Code of Construction Practice (APP-336) would mitigate against these potential effects and therefore there are no significant effects reported in the ES. There are no significant residual effects on surface water receptors/flood risk reported in the ES.	Realignment of the temporary Linford water pipeline further west from Linford has the potential to change reported groundwater effects. REAC RDWE054 would be modified to include the changed work to prevent any potential impacts to the irrigation reservoir. The conclusion of significance presented in the ES would therefore remain as presented in the Application.
Climate	There are no significant effects reported.	The changes proposed would result in no changes to the reported greenhouse gas emissions or conclusions in relation to climate resilience.

4 Construction update

The construction of the road tunnels may be undertaken using one or two tunnel boring machines (TBMs). Our DCO Application set out an assessment assuming works would be undertaken using two TBMs. This update sets out how the works would be undertaken if a single TBM was to be used.

Delivering the works using a single TBM could deliver several efficiencies, particularly in terms of significant cost savings and a reduction in material use. Using a single TBM would result in a saving of approximately 38,000 tonnes of carbon (CO_2e) by using less machinery.

If only a single TBM is used it would be driven from the north and turned around at the southern tunnel entrance to drive the second tunnel back to the north. The spoil from the second drive back north would be taken back through the tunnel.

The single TBM approach to tunnel construction would involve no physical changes to the permanent works or footprint of LTC presented in the DCO Application, nor would it require new powers over land to deliver the works.

The overall construction programme set out in the DCO Application would remain the same, whether the road tunnels were constructed with one or two TBMs.

While there would be a small number of differences in the logistics and impacts associated with a single TBM approach, there would be no materially new or different environmental effects arising compared to those presented in the DCO Application.

There would be a minimal impact on the timing for construction of the tunnels. The construction works required at the northern tunnel entrance before the tunnelling can start would be smaller in scale, allowing tunnelling to start approximately 10 months earlier in the programme.

Using a single TBM rather than two TBMs would result in a change in staffing patterns at the construction compounds for the northern and southern tunnel entrances. This is because the use of a single TBM requires fewer staff, and requires less equipment to be brought to site.

While there would be some changes to the numbers of staff vehicles over the construction period, there would be an overall reduction in the number of journeys made to both the northern and southern compound. The traffic management measures we have assumed in our Transport Assessment would not change.

As some works would be starting sooner at the northern compound, there would be an increase in journeys related to construction in the second year of building LTC. However even with this increase they would remain lower than during the most intensive construction phase. Traffic during the most intensive construction phase would be slightly lower than compared with using two TBMs.

We have considered the effects of using a single TBM and set out the findings in the table on page 31.

If we are granted permission to build LTC then our contractors would determine whether to use one or two TBMs.

Construction related environmental assessment of using a single TBM approach

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
Air Quality	There are no significant effects reported.	As there would be minimal changes to the construction that would alter the air quality effects, no new or different significant effects are anticipated.
Cultural Heritage	A number of significant adverse effects to non-designated archaeological assets have been reported in the ES in relation to the construction of the northern tunnel entrance and the cut and cover works.	As the overall footprint of the tunnel and associated construction works would not change no new or different significant effects are anticipated.
Landscape and Visual	The landscape and visual effects of the southern tunnel entrance compound, including the southern tunnel entrance are reported in Chapter 7 of the ES (APP-145).	No new or different significant landscape and visual effects are anticipated. This is because the use of cranes (the most visible above ground element associated with the TBM) remains unchanged.
Terrestrial and Marine Biodiversity	A number of significant adverse effects to ecological receptors have been reported in the ES in relation to the construction of the Project, notably around direct habitat loss, and visual and noise disturbance.	Habitat loss and disturbance would not change, therefore no new or different significant effects are anticipated.
Geology and Soils	No significant adverse effects have been reported in relation to the TBM/tunnel construction for geology/contamination. A significant effect has been reported for the Project's impacts to best and most versatile land.	No new or different significant effects are anticipated. From a soils perspective using a single TBM would not result in any increased land take (both temporary and permanent) and the effect reported on best and most versatile land would remain.
Material Assets and Waste	A significant adverse effect has been reported against the	No new or different significant effects are anticipated.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
	Project's impact on landfill capacity in the study area.	A single TBM would still generate the same volume of material, which would be managed in line with the measures set out in the DCO Application. The assumptions around the use of treated tunnel material remain the same as in the DCO Application.
Noise and Vibration	There are no significant effects reported within the locality of these works during construction in the ES.	No new or different significant noise effects are anticipated. The construction noise assessment associated with TBM works would not affect the delivery of associated noise and vibration mitigation.
Population and Human Health	There are no significant effects reported.	As the impacts on people in the vicinity of the tunnelling works would not change noticeably as a result of a single TBM, no new or different significant effects are anticipated.
Road Drainage and the Water Environment	There are no significant effects reported.	The groundwater assessment undertaken to inform the ES has assumed a worst-case scenario for the level of excavation for the northern tunnel entrance (for both temporary and permanent works) and commitments set out in the REAC remain in place for control of groundwater and protection of surface water and groundwater quality. The turn-around of the TBM at the southern tunnel entrance does not result in new interactions with groundwater. There would be no change to the delivery or effectiveness of flood mitigation.

Environmental topic	Reported significant effects in the DCO Environmental Statement (ES)	Change in significant effects reported in the DCO Environmental Statement
		No new or different significant effects are therefore anticipated.
Climate	There are no significant effects reported.	Using a single TBM would result in a saving of approximately 38,000 tonnes CO2e as a result of reduced carbon from the TBM, reduced hardstanding and smaller slurry treatment and segment production facilities. Despite this reduction, no new or different significant effects are anticipated.

5 How to have your say

Please let us know your views on the changes presented in our minor refinement consultation. All the consultation information, including the response form, is available at https://highwaysengland.citizenspace.com/ltc/minor-refinement-consultation-2023.

You can have your say using any of the methods listed below.

Online

Fill in the survey at https://highwaysengland.citizenspace.com/ltc/minor-refinement-consultation-2023.

Post

Send a printed response form or letter to the following address:

Consultation Response
Lower Thames Crossing
Pilgrims Lane
Chafford Hundred
Grays
RM16 6RL

Unless using a pre-paid envelope supplied by National Highways, respondents are required to pay appropriate delivery charges for responses sent to this address.

Email

Send your comments to consultationresponses@lowerthamescrossing.co.uk

National Highways cannot guarantee that responses sent to any other address will be received.

The deadline for submitting a response is 23:59 on 19 June 2023.

National Highways' consideration of valid responses will be described in a change submission, which will include a consultation report that will be submitted to the Examining Authority and published in due course.

Data privacy notice

We are committed to protecting your personal information. Whenever you provide this information, we are legally obliged to use it in line with all applicable laws concerning the protection of personal data, including the UK General Data Protection Regulation (GDPR).

How will National Highways use the information we collect about you?

We will use your personal data collected via this consultation to:

- Analyse your feedback to the consultation
- Produce a summary report, based on our analysis of responses (individuals will not be identified in our consultation report)
- Write to you with updates about the results of the consultation and other developments
- Keep up-to-date records of our communications with individuals and organisations

Any personal information you include in this form will be available to, or used by:

- National Highways
- The Planning Inspectorate (the government agency that will consider our Application for permission to build the Lower Thames Crossing)
- The Secretary of State for Transport (who will decide on our Application)
- Our legal advisers
- Consultants working on the Lower Thames Crossing

It is also possible that trusted third-party providers, for example construction companies, may later use your contact details to communicate with you about this project.

Under the terms of the UK GDPR, you have certain rights over how your personal data is retained and used by National Highways.

For more information, see our full data privacy statement at https://nationalhighways.co.uk/our-work/lower-thames-crossing/privacy-notice/.

6 Find out more

The minor refinement consultation document and response form can be viewed online from **Wednesday 17 May 2023** until at least the close of the consultation on **Monday 19 June 2023:**

https://highwaysengland.citizenspace.com/ltc/minor-refinement-consultation-2023/

For those unable to access the internet, a printed copy of the consultation document and response form, as well as a pre-paid return envelope, are available to order free of charge (one pack per household), using one of the following methods:

- By emailing National Highways via info@lowerthamescrossing.co.uk
- By phoning National Highways on 0300 123 5000

You can also use these contact details if you are having difficulties understanding or accessing the consultation materials, or you have any questions about the consultation process.

On request, a USB containing copies of all DCO Application documents can be provided free of charge and will be limited to one USB per household. A hard copy of the Application documents can also be obtained for a charge of £15,000 inclusive of VAT (copies of individual documents are also available on request and a reasonable charge may apply). Hard copy requests will also be limited to one set per household.

7 Hyperlinks

While this is a digital consultation, we have made a limited number of physical documents available upon request to ensure accessibility. Below is a list of all the hyperlinks we have included in the environmental assessment tables throughout chapter 3 to various chapters of the DCO Application Environmental Statement (ES) and other documents, should you wish to find out more.

ES Appendix 7.10 (APP-385): https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001559-6.3%20Environmental%20Statement%20Appendix%207.10%20-%20Schedule%20of%20Visual%20Effects.pdf

ES Appendix 7.9 (APP-384): https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001418-6.3%20Environmental%20Statement%20Appendix%207.9%20-%20Schedule%20of%20Landscape%20Effects.pdf

ES Appendix 10.4 (APP-425): https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001443-6.3%20Environmental%20Statement%20Appendix%2010.4%20-%20Agricultural%20Land%20Classification%20Factual%20Report.pdf

ES Chapter 6 (AS-044): https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001938-6.1%20Environmental%20Statement%20Chapter%206%20-%20Cultural%20Heritage_v2.0_clean.pdf

ES Chapter 7 (APP-145): https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001593-6.1%20Environmental%20Statement%20Chapter%207%20-%20Landscape%20and%20Visual.pdf

ES Chapter 8 (APP-146); https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001595-6.1%20Environmental%20Statement%20Chapter%208%20-%20Terrestrial%20Biodiversity.pdf

ES Chapter 11 (APP-149): https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010032/TR010032-001583-6.1%20Environmental%20Statement%20Chapter%2011%20-%20Material%20Assets%20and%20Waste.pdf

Please submit your response by
23:59 on 19 June 2023

If you need help accessing this or any other National Highways information, please call **0300 123 5000** and we will help you.

This document is also available on our website at **www.nationalhighways.co.uk**

For an accessible version of this publication please call **0300 123 5000** and we will help you.

If you have any enquiries about this publication email **info@nationalhighways.co.uk**
or call **0300 123 5000***. Please quote the National Highways publications code **PR25/23**.

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