national highways

# Lower Thames Crossing

## 9.8 Environmental Statement Addendum (Clean version)

Infrastructure Planning (Examination Procedure) Rules 2010

Volume 9

**DATE: August 2023**
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**VERSION**: 2.0

# Revision History

| Version | Date | Submitted at |
|---|---|---|
| 1.0 | 18 July 2023 | Deadline 1 |
| 2.0 | 3 August 2023 | Deadline 2 |

# Lower Thames Crossing

# 9.8 Environmental Statement Addendum (Clean version)

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# 1 Introduction

## 1.1 Document purpose

1.1.1 This document has been prepared to outline updates to the following Application Documents submitted as part of the Development Consent Order (DCO) application for the A122 Lower Thames Crossing (the Project) in October 2022:

a. 6.1 Environmental Statement [**APP-138 to APP-155**]

b. 6.2 Environmental Statement - Figures [**APP-156 to APP-331**]

c. 6.3 Environmental Statement - Appendices [**APP-332 to APP-485**]

d. 6.4 Environmental Statement - Non-Technical Summary (NTS) [**APP-486**]

1.1.2 It is intended that this document remains a live document throughout Examination and would be used to track updates and amendments to the Environmental Statement documents, when required. Further amendments or points of clarification which arise through Issue Specific Hearings, Written Representations, Written Questions or other relevant elements of the Examination process, would be incorporated into this document accordingly. This document will be updated and re-submitted for each of the Examination Deadlines.

### Update for Version 2 at Examination Deadline 2

1.1.3 The 9.8 Environmental Statement Addendum (version 1) [**REP1-181**] has been updated and submitted at Deadline 2 to capture amendments to Environmental Statement documents, as identified in Sections 2, 3, 4, and 6, and two additional appendices. Appendices C and D have been prepared in response to the Action Points from ISH1 - 21 June 2023 [**EV-023a**] and provide the background and detailed responses required.

## 1.2 Document structure

1.2.1 Section 2 of this document details the updates to the various chapters of the Environmental Statement [**APP-138 to APP-155**] since the DCO submission, and sets out amendments accordingly within Table 2.1 and Table 2.2.

1.2.2 Section 3 of this document details the updates to the various figures that accompany the Environmental Statement [**APP-156 to APP-331**] since the DCO submission, and provides cross-references to the amended and re-issued figures within Table 3.1 and Table 3.2.

1.2.3 Section 4 of this document details the updates to the various appendices that accompany the Environmental Statement [**APP-332 to APP-485**] since the DCO submission, and sets out amendments and provides cross-references to the amended and re-issued appendices within Table 4.1 and Table 4.2.

1.2.4 Section 5 of this document details the updates to and errata identified within the Environmental Statement Non-Technical Summary [**APP-486**] which have been

identified since the DCO submission, consistent with the updates identified in Sections 2 to 4 of this Addendum.

1.2.5 The attached appendices present topic-specific information as identified within Sections 2 to 5 of this document.

1.2.6 A summary of the Application Documents within the Environmental Statement which have been updated and reported on in this ES Addendum is provided in Section 6; together with other new information issued for the first time as Appendices to support the Environmental Statement.

## Document contents

1.2.7 Within the tables identified above, each row describes an amendment or update to the Environmental Statement. Each update is identified by Document Reference, location within the document, reason for amendment and amendment required. In most cases the original chapter or appendix has not been re-issued as a new version and the relevant rows within the ES Addendum tables form the record of the update to that document.

1.2.8 Where the update cannot simply be presented as a row in a table, the relevant document has been updated and is submitted as an updated version alongside the ES Addendum at the same Deadline. This is the case for some chapter and appendix updates and for all updates to figures. Information on the updated version of each document is provided in the tables alongside the description of the change. The Examination Library reference numbers will be added for relevant rows at the next subsequent update of this ES Addendum.

1.2.9 Within the tables identified above, text shown in blue font with a strikethrough indicates text which is now removed from the relevant section of the Environmental Statement. Text shown in green font indicates text which is updated or new at the according submission Deadline, as defined by the Planning Inspectorate.

## Exclusions

1.2.10 This ES Addendum tracks updates and amendments to all ES chapters, figures and appendices with the exception of changes to control documents, as these are considered live documents and may be subject to more extensive change than can reasonably be tracked in the ES Addendum.

1.2.11 The control documents which sit within the ES but are not tracked within the ES Addendum are as follows:

a. 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan (Version 2.0) (Tracked and Clean) [**REP1-156** and **REP1-157**]

b. 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan - Annex A - Outline Site Waste Management Plan [**APP-337**]

c. 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First iteration of Environmental Management Plan - Annex B - Outline Materials Handling Plan [**APP-338**]

d. 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First iteration of Environmental Management Plan - Annex C - Preliminary Works Environmental Management Plan [**APP-339**]

1.2.12 Where updates are made to the control documents, these will be republished as revised versions at the relevant examination deadline. Where only minor corrections are required, these are identified in the Errata Report (Version 2, and subsequent versions). These corrections would then be incorporated into the next published revision of the control document.

# 2 Environmental Statement chapter updates

## 2.1 Section 51 submission December 2022

2.1.1 Table 2.1 outlines amendments which have been identified since submission of the DCO application in relation to the chapters of the Environmental Statement. These amendments were reported within the Errata Report (Version 1.0) [**AS-004**] published by the Examining Authority on 22 December 2022.

**Table 2.1 Environmental Statement chapter updates December 2022**

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| 6.1 Environmental Statement - Chapter 2 - Project Description<br>[**APP-140**] | Paragraph 2.2.39, bullet point b requires revision as it includes out of date REAC reference text. | Paragraph 2.2.39, bullet point b of ES Chapter 2 is amended to:<br>b. A minimum of 30 individual specimen trees would be planted as replacement for ~~10~~ lost veteran trees (REAC Ref. LV032). |
| 6.1 Environmental Statement - Chapter 6 - Cultural Heritage<br>[**APP-144**] | Chapter 6 requires revision to address errors in reported asset numbers and number counts following incorporation of archaeological trial trenching data. | ES Chapter 6 is amended to address errors in reported asset numbers and number counts.<br><br>Resubmitted in December 2022 as:<br>Additional Submission - 6.1 Environmental Statement - Chapter 6 - Cultural Heritage - (Clean) (Version 2) - Accepted at the discretion of the Examining Authority [**AS-044**]<br><br>Additional Submission - 6.1 Environmental Statement - Chapter 6 - Cultural Heritage - (Tracked) (Version 2) - Accepted at the discretion of the Examining Authority [**AS-045**]<br><br>The detail of the changes made to ES Chapter 6 are provided in Table A.1 of Appendix A to the Errata Report [**AS-004**]. |

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| 6.1 Environmental Statement - Chapter 13 - Population and Human Health [**APP-151**] | Chapter 13 requires revision to correct the eight instances of 'Gammon Field' Travellers Site' with 'Gammonfields Way Travellers' Site'. | ES Chapter 13 is amended to replace the eight instances of 'Gammon Field' Travellers Site' with Gammonfields Way Travellers' Site. |

## 2.2 Deadline 1 updates

2.2.1 Table 2.2 outlines amendments which have been identified through pre-examination and examination in relation to the chapters of the Environmental Statement and were submitted to the Examining Authority at Deadline 1 (18 July 2023).

**Table 2.2 Environmental Statement chapter updates – Deadline 1**

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td>6.1 Environmental Statement - Chapter 2 - Project Description [APP-140]</td><td>Paragraph 2.4.206 requires revision to correct the reported number of properties requiring demolition from 26 to 31 north of the River Thames.</td><td>Paragraph 2.4.206 of ES Chapter 2 is amended to:<br>North of the River Thames, there are 61 residential properties within the Order Limits, of which ~~26~~ 31 would require demolition. There are seven commercial properties within the Order Limits north of the river, one of which would require demolition.</td></tr>
<tr><td>6.1 Environmental Statement - Chapter 6 - Cultural Heritage [AS-044]</td><td>Chapter 6 requires amendment to update the assessment of previously identified heritage assets, where the link between a Grade I listed building and non-designated built heritage asset had not previously been identified.</td><td>Section 6.4, Section 6.6, Table 6.4 and Table 6.8 of ES Chapter 6 are amended to:<br>Table 6.4 Summary of cultural heritage assets
<table>
<tr><th>Heritage assets</th><th>Value</th><th>South of the River Thames</th><th>River Thames</th><th>North of the River Thames</th></tr>
<tr><td>Built heritage</td><td>High</td><td>1 (RPG)<br>3 (CA)<br>~~105~~ 106 (LB)</td><td>n/a</td><td>2 (RPG)<br>6 (CA)<br>177 (LB)</td></tr>
</table>
Paragraph 6.4.110 is amended to delete bullet point c:<br>~~c. Gadshill Place (LB241) which is located immediately to the south of the A226 and the Order Limits in Higham.~~<br>The following new paragraph is added after paragraph 6.4.110 and before paragraph 6.4.111:</td></tr>
</table>

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | Gadshill Place (LB241), the Grade I listed former home of Charles Dickens is located immediately to the south of the A266 and the Order Limits in Higham. However, within the curtilage a tunnel was constructed between 1857 and 1870 which extends into the Order Limits underneath the A226.<br><br>Paragraph 6.4.112 is amended to:<br><br>Outside the Order Limits and within the 1km study area and landscape study area south of the River Thames there are a total of ~~105~~ 104 listed buildings of high value due to the varying combinations of their individual aesthetic, historic, evidential and communal values plus the contribution of their settings (LB1, LB2, LB3, LB4, LB12, LB13, LB14, LB15, LB16, LB17, LB18, LB19, LB20, LB21 LB22, LB23, LB24, LB25, LB26, LB27, LB28, LB29, LB30, LB31, LB78, LB79, LB99, LB100, LB101, LB102, LB103, LB104, LB105, LB106, LB112, LB114, LB117, LB118, LB122, LB123, LB124, LB125, B126, LB173, LB174, LB175, LB176, LB178, LB179, LB180, LB182, LB183, LB184, LB185, LB186, LB187, LB190, LB191, LB192, LB193, LB194, LB195, LB196, LB197, LB198, LB199, LB200, LB201 LB202, LB218, LB219, LB220, LB221, LB222, LB223, LB224, LB225, LB227, LB230, LB236, ~~LB241,~~ LB242, LB247, LB248, LB252, LB254, LB263, LB264, LB265, LB266, LB302, LB306, LB307, LB310, LB311, LB312, LB313, LB321, LB323, LB324, LB326, LB333, LB334, LB335, LB337).<br><br>The following new paragraph is added after paragraph 6.4.119 and before paragraph 6.4.120, under the ‘Baseline Details’ sub-heading:<br><br>The high value Gadshill Place (LB241) is a Grade I listed building located on Gravesend Road in Higham. The house was constructed in 1779 by a former Mayor of Rochester and was owned and occupied by the author Charles Dickens from 1857 until his death in 1870. Dickens added a large conservatory to the house and internally, his study is still preserved. The house is set within its own grounds and has been used as a school since the 20th century. Additional school buildings have been added to the south of the house. The tunnel was used as an air raid wardens post during the Second World War (Heritage Asset 2461). |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | Paragraph 6.6.91 is amended to:<br><br>There are ~~59~~ 58 low value non-designated archaeological assets recorded within the Order Limits (675, 677, 703, 779, 787, 788, 793, 796, 798, 804, 805, 1331, 1398, 1408, 1409, 1423, 1428, 1429, 1436, 1454, 1459, 1515, 1520, 1524, 1557, 1577, 1598, 1603, 1609, 1663, 1668, 1787, 1821, 1822, ~~2461,~~ 2512, 3185, 3535, 3852, 3854, 3644, 3658, 3737, 3741, 3770, 3786, 3796, 3798, 3804, 3806, 4415, 4426, 4429, 4430, 4596, 4608, 4609, 4610, 4612), which would experience, following mitigation (REAC Ref. CH001; AMS-OWSI No. 4), a permanent impact of moderate adverse magnitude and a **slight adverse** effect, which is assessed as **not significant**.<br><br>Paragraph 6.6.92 is amended to:<br><br>There are ~~ten~~ 11 low value non-designated archaeological assets recorded within the Order Limits (781, 1324, 1469, 1547, 2461, 3126, 3752, 3756 4180, 4425) which would experience following mitigation in the form of archaeological excavation and recording (REAC Ref. CH001; AMS-OWSI No.2 and No. 4) a permanent impact of minor adverse magnitude and a **slight adverse** effect, which is assessed as **not significant**.<br><br>The following new paragraphs are added after paragraph 6.6.109 and before paragraph 6.6.110, under the 'Built Heritage: non-significant effects' sub-heading:<br><br>The noise, visual intrusion and dust caused by construction activity would result in a temporary impact on the high value Grade I listed Gadshill Place (LB241). This would result in a temporary impact of minor adverse magnitude and a **slight adverse** effect, which is assessed as **not significant**.<br><br>Construction traffic movement along the A266 could potentially cause harm to the tunnel (2461) below the road. This would result in a permanent impact of minor adverse magnitude and a **slight adverse** effect, which is assessed as **not significant.** To ensure that any minor damage to the tunnel is identified a buildings survey will take place prior to the start of construction traffic |

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td></td><td></td><td>movements (REAC ref CH001; AMS-OWSI No. 2) and regular monitoring will take place. Reinforcement and remedial works will be provided if required post construction.<br><br>Table 6.8 is amended to include the following additional row before the Grade II* Cobham Hall Registered Park and Garden (RPG1) row:<br><br>Table 6.8 Summary of cultural heritage assets
<table>
<tr><th>Impact Description</th><th>Value</th><th>Impact Magnitude</th><th>Significance of effect</th><th>Significance</th></tr>
<tr><td>Permanent Impact to the curtilage of high value Grade I listed Gadshill Place (LB241)</td><td>High</td><td>Minor</td><td>Permanent slight adverse</td><td>Not significant</td></tr>
</table></td></tr>
<tr><td>6.1 Environmental Statement - Chapter 7 - Landscape and Visual<br>[APP-145]</td><td>Chapter 7 requires amendment to report the identification of four additional visual receptors since submission of the DCO application, that are likely to experience significant effects within the landscape study area.</td><td>Sections 7.6 and 7.9 of ES Chapter 7 are amended to report the additional visual receptors likely to experience significant effects.<br><br><u>Section 7.6 Assessment of likely significant effects – Construction phase</u><br>Addition to Table 7.22 Schedule of visual effects on visual receptors south of the River Thames during construction:<br>• VR-S03-R-035 Polperro, A226 Rochester Road:<br>– Visual sensitivity: High<br>– Magnitude of visual effect: Major<br>– Significance of effect: Very large adverse<br>Additions to Table 7.24 Schedule of visual effects on visual receptors north of the River Thames during construction:<br>• VR-S11-R-043 Five Chimney Cottages, A1013 Stanford Road:<br>– Visual sensitivity: Moderate</td></tr>
</table>

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | – Magnitude of visual effect: Major<br>– Significance of effect: **Large adverse**<br>• VR-S09-O-007 Condovers Scout Activity Centre, Church Road, West Tilbury:<br>– Visual sensitivity: Moderate<br>– Magnitude of visual effect: Moderate<br>– Significance of effect: **Moderate adverse**<br>• VR-S11-O-011 Orsett Heath Academy, Grays, adjacent to Thurrock Rugby Football Club:<br>– Visual sensitivity: Moderate<br>– Magnitude of visual effect: Moderate<br>– Significance of effect: **Moderate adverse**<br><br><u>Section 7.6 Assessment of likely significant effects – Operational phase</u><br>Additions to Table 7.32 Schedule of visual effects on visual receptors north of the River Thames during operation:<br>• VR-S11-R-043 Five Chimney Cottages, A1013 Stanford Road:<br>– Visual sensitivity: Moderate<br>– Magnitude of visual effect in opening year (winter): Major<br>– Significance of effect in opening year (winter): **Large adverse**<br>– Magnitude of visual effect in design year (summer): Moderate<br>– Significance of effect in design year (summer): **Moderate adverse**<br>• VR-S11-O-011 Orsett Heath Academy, Grays, adjacent to Thurrock Rugby Football Club:<br>– Visual sensitivity: Moderate<br>– Magnitude of visual effect in opening year (winter): Moderate<br>– Significance of effect in opening year (winter): **Moderate adverse**<br>– Magnitude of visual effect in design year (summer): Minor<br>– Significance of effect in design year (summer): **Slight adverse** |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | Section 7.9 – Summary<br>Modifications to Table 7.35 Visual impact table:<br>• Construction effect, south of the River Thames:<br>– Very large adverse: ~~4~~ 5 residential receptors or groups - Significant<br>– Slight adverse: ~~10~~ 11 other receptors or groups - Not significant<br>• Construction effect, north of the River Thames:<br>– Large adverse: ~~28~~ 29 residential receptors or groups - Significant<br>– Moderate adverse: ~~7~~ 9 other receptors or groups - Significant<br>• Operation effect, south of the River Thames:<br>– Slight adverse at opening year, slight adverse at design year: ~~17~~ 18 residential receptors or groups - Not significant<br>– Slight adverse at opening year, slight adverse at design year: ~~3~~ 4 other receptors or groups - Not significant<br>• Operation effect, north of the River Thames:<br>– Large adverse at opening year, moderate adverse at design year: ~~8~~ 9 residential receptors or groups - Significant<br>– Moderate adverse at opening year, slight adverse at design year: ~~2~~ 3 other receptors or groups - Significant<br>– Slight adverse at opening year, slight adverse at design year: ~~4~~ 5 other receptors or groups - Not significant |
| 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [**APP-146**] | Paragraph 8.3.33 requires revision to resolve incomplete sentence. | Paragraph 8.3.33 of ES Chapter 8 is amended to:<br>The existing and future baseline conditions for terrestrial biodiversity are outlined in Section 8.4. |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [APP-146]<br><br>6.1 Environmental Statement - Chapter 13 - Population and Human Health [APP-151] | Paragraph 8.6.448 references assessment detailed in Chapter 13 in relation to recreational pressure at Shorne Woods Country Park as a result of the proposed Thong Lane car park.<br>Chapter 13 omitted to include a detailed assessment of changes in recreational pressure as a result of the new car park as referenced in Chapter 8. | No amendment to ES Chapter 8 (APP-146) or ES Chapter 13 [APP-151] is proposed.<br>A technical note has been prepared to report on this assessment topic and respond to specific comments raised by Natural England. This technical note is presented in Appendix A of this ES Addendum. |
| 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [APP-146] | Table 8.35 and paragraph 8.6.267 require revision to amend value error for loss of acid grassland. | Paragraph 8.6.267 of ES Chapter 8 is amended to:<br>The Project would result in the irreversible loss of ~~0.53ha~~ 1.14ha of unimproved and semi-improved acid grassland located within Low Street Pit LWS and Blackshots Nature Reserve LWS, and which is of county importance. To compensate for this loss, 5.03ha of acid grassland habitat would be created within close proximity to the existing grassland. This would be achieved through soil translocations and targeted management to encourage the establishment of acidic species (see Figure 2.4: Environmental Masterplan (Application Document 6.2), the Design Principles (Application Document 7.5) Clause no. LSP.22, PRO.04, PLA.05, LSP.02, LSP.04 and LSP.09, and REAC Ref. TB019). The level of impact on acid grassland as a result of the Project would be permanent minor adverse, resulting in a slight adverse effect which is considered **not significant**. |

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td></td><td></td><td>The following row in Table 8.35 of ES Chapter 8 is amended to:<br><br>Table 8.35 Habitat losses and gains associated with the Project to the north of the River Thames
<table>
<tr><th>Existing habitat</th><th>Importance</th><th>Habitat loss</th><th>New semi-natural habitat (from EMP)</th><th>Habitat permanent gain</th><th>Net permanent gain (gain – loss)</th></tr>
<tr><td>Acid grassland</td><td>County</td><td>~~0.53ha~~<br>1.14ha</td><td>Translocated acid grassland (LE8.6)</td><td>5.03ha</td><td>~~4.5ha~~<br>3.98ha</td></tr>
</table></td></tr>
<tr><td>6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [APP-146]</td><td>Table 8.19 requires amendment to correct the distance of Mucking Flats and Marshes SSSI from the Order Limits</td><td>The first row in Table 8.19 of ES Chapter 8 is amended to:<br><br>Table 8.19 Statutory designated sites within the study area north of the River Thames
<table>
<tr><th>Designated site</th><th>Interest features, citation lists and reasons for designation</th><th>Level of importance</th><th>Approximate distance from Order Limits</th></tr>
<tr><td>Mucking Flats and Marshes SSSI</td><td>Mudflats, saltmarsh and grassland supporting important populations of wintering wildfowl and waders and invertebrates.</td><td>National</td><td>~~0m (within Order Limits)~~<br>Adjacent to Order Limits</td></tr>
</table></td></tr>
<tr><td>6.1 Environmental Statement – Chapter 9 – Marine Biodiversity [APP-147]</td><td>Chapter 9 requires revision at paragraph 9.5.6 bullet point a. to ensure that the wording is interpreted that the proposed tunnel depth is at the absolute limit to avoid riverbed works, such as requirement for scour protection and the</td><td>Paragraph 9.5.6, bullet point a. of ES Chapter 9 is amended to:<br><br>Construction phase embedded mitigation of relevance to marine biodiversity is as follows:<br><br>a. ~~Construction of the m~~ Main tunnels would be constructed with adequate cover and in line with the River Restriction Plan (Application Document 2.14) and draft DCO (Application Document 3.1). These controls and constraints on the Limits of Deviation ensure that the tunnel would be constructed to a depth to allow 12.5m of river depth below chart datum and with sufficient capacity to allow for 0.5m of over dredge. This sufficiently avoids the need for any construction or operational remedial works within the River Thames. ~~a layer of cover above of at least 0.9 tunnel diameter~~</td></tr>
</table>

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | tunnel design provides flexibility in its depth without impacting river use and the ability to dredge the river to an agreed deeper depth in the future. | ~~(14.4m). This avoids the need for works within the River Thames to provide additional scour protection, which would have otherwise required modelling and mitigation to reduce effects on a number of marine ecological receptors.~~<br><br>The cross references from the new text is to the following documents River Restriction Plan (Application Document 2.14 [**APP-045**]) and draft DCO (Application Document 3.1 [**AS-038**]). |
| 6.1 Environmental Statement - Chapter 10 - Geology and Soils Health [**APP-148**] | Paragraph 10.5.8 bullet point u. requires revision to match the wording of commitment GS028 of the REAC and explain the alignment with the Remediation Options Appraisal and Outline Remediation Strategy. | Paragraph 10.5.8 bullet point u. of ES Chapter 10 is amended to:<br><br>u. The construction works would include the removal of vegetation, stripping of topsoil, excavation and earth movements. These activities could cause the spreading and mobilisation of contaminants. Unforeseen contamination has the potential to be discovered during the construction of the Project: (REAC Ref. GS028).<br><br>i. During earth movement works, a watching brief protocol would be implemented under the supervision of an Environmental Clerk of Works in accordance with the Remediation Options Appraisal and Outline Remediation Strategy (ES Appendix 10.11, Application Document 6.3).<br>ii. Site workers would be vigilant to ensure visual or olfactory signs of contamination are noted and that contaminated soil is kept separate from other materials.<br>iii. Appropriate analysis and assessment would be undertaken by a suitably qualified person on suspected contaminated soils to establish the action required |
| 6.1 Environmental Statement - Chapter 13 - Population and Human Health [**APP-151**] | Table 13.56 requires revision to the description of receptors.<br><br>Table 13.74 requires revision to the reported number of properties requiring demolition from 26 to 31 properties to the | The following row in Table 13.56 of ES Chapter 13 is amended to: |

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td></td><td>north of the River Thames.</td><td>
Table 13.56 Residential properties subject to demolition – north of River Thames
<table>
<tr><th>Receptor</th><th>Sensitivity</th><th>Magnitude of impact</th><th>Significance of effect</th></tr>
<tr><td>~~1-2 Whitfield Cottages,~~ Whitfield Cottage, Barn View and Stable View, Stifford Clays Road</td><td>High</td><td>Major adverse</td><td>Very large adverse</td></tr>
<tr><td>~~Yellow Stock Mews~~1-5 Yellow Stock Mews, Ockendon Road</td><td>High</td><td>Major adverse</td><td>Very large adverse</td></tr>
</table>
The following row in Table 13.74 of ES Chapter 13 is amended to:
Table 13.74 Land-use and accessibility sub-topics summary impact table
<table>
<tr><th>Impact description</th><th>Sensitivity</th><th>Impact magnitude</th><th>Effect</th><th>Significance</th></tr>
<tr><td colspan="5">Construction</td></tr>
<tr><td colspan="5">North of the River Thames</td></tr>
<tr><td>Private property and housing – ~~26~~ 31 properties affected by demolition</td><td>High</td><td>Major adverse</td><td>Very large / large adverse</td><td>Significant</td></tr>
</table>
This update to the number of demolished properties is also relevant to the Health and Equalities Impact Assessment (HEqIA) [APP-539]. This update is reported in the Errata Report (Version 2) [REP1-004].
</td></tr>
<tr><td>6.1 Environmental Statement - Chapter 13 -</td><td>Table 13.66 requires amendment to include further information on the Two Forts Way temporary closures and</td><td>Table 13.66 of ES Chapter 13 is amended to include further information on Two Forts Way temporary closures:</td></tr>
</table>

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td>Population and Human Health<br>[APP-151]</td><td>alternative route available.</td><td>
Table 13.66 PRoW temporarily or permanently affected by the Project – north of the River Thames
<table>
<tr><th>Receptor</th><th>Nature of effect</th><th>Change in journey length</th><th>Sensitivity of route</th><th>Magnitude of impact</th><th>Significance of effect</th></tr>
<tr><td>FP146</td><td>This route would be subject to a temporary closure for a period of less than one month to allow for a section of the Two Forts Way to be upgraded for use by pedestrians and<br>cyclists. For the duration of the temporary closure, an alternative route would be available for users, via the realigned England Coast Path.</td><td>No change</td><td>Medium</td><td>No change</td><td>Neutral</td></tr>
<tr><td>FP146</td><td>The Two Forts Way would be subject to a further temporary closure for a period of approximately eight weeks to allow for the installation of a water inlet with self-regulating valve into the sea wall. An alternative route would be available for users of the Two Forts Way during this period, via the realigned England Coast Path.</td><td>No change</td><td>Medium</td><td>No change</td><td>Neutral</td></tr>
</table>
</td></tr>
<tr><td>6.1 Environmental Statement - Chapter 16 - Cumulative</td><td>Paragraph 16.5.40 requires revision to correct the reported number of significant effects on soils from 50 to 53 and align with the</td><td>Paragraph 16.5.40 of ES Chapter 16 is amended to:<br><br>Based on the data available on the other development proposals, the cumulative effects assessment identified ~~50~~ 53 shortlisted developments with the potential to cause significant inter-project effects for soils receptors, during construction.</td></tr>
</table>

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td>Effects Assessment<br>[APP-154]</td><td>information reported in ES Appendix 16.2.</td><td></td></tr>
<tr><td>6.1 Environmental Statement - Chapter 16 - Cumulative Effects Assessment<br>[APP-154]</td><td>Table 16.10 requires revision to align with significant effects reported in ES Appendix 16.2 (Short List of Developments).<br>This relates specifically to significant effects on soils for three shortlisted developments and removal of a single non-significant effect on population and human health receptors.</td><td>Table 16.10 of ES Chapter 16 is amended to include significant effects for the following three developments:<br>• 21/01525/OUT - Entire land east of A128 south of A127.<br>• 20/503707/HYBRID - Kent Science Park<br>• MC/19/0287 - Land at Town Road Cliffe Woods<br>Table 16.10 Inter-project cumulative effects on receptors
<table>
<tr><th>Development</th><th>Description</th><th>Construction</th><th>Operation</th><th>Residual Cumulative Effect</th></tr>
<tr><td>Entire Land East Of A128 South Of A127 Tilbury Road West Horndon Essex. Also known as Dunton Hills, Brentwood<br>- Reference: 21/01525/OUT<br>(approximately 4km from Order Limits and adjacent to ARN) Brentwood Borough Council area</td><td>No revision to description documented in ES Chapter 16 Table 16.10.</td><td>~~Population and Human Health: Effects during construction may depend on timescale for the proposal coming forward, as adverse effects may be experienced in relation to residential amenity and accessibility as a result of increased construction traffic movements.~~</td><td>~~Population and Human Health: Slight beneficial effects anticipated during scheme operation in terms of potential increased accessibility for employment and access to community facilities.~~</td><td>~~Residential Amenity and Access - Slight Adverse and not significant effect (Construction)~~<br><br>~~Employment and Access - **Slight Beneficial** and **significant effect** (Operation)~~</td></tr>
</table></td></tr>
</table>

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 | | | | |
|---|---|---|---|---|---|---|
| | | | | Soils:<br>Construction works should follow good practice in relation to soil handling and reinstatement where applicable.<br>Impact on agricultural land, some of which has the potential to be best and most versatile land. | Soils: No cumulative effects likely during operational phase; impacts assessed at construction phase. | Soils - **Very Large Adverse** and **significant effect** (Construction)<br><br>Soils - Neutral and not significant effect (Operation) |
| | | Kent Science Park Shimmin Road Sittingbourne<br>- Reference: 20/503707/HYBRID<br>(approximately 12.6km from Order Limits and 450m from ARN)<br>Swale District Area | Hybrid planning application consisting of - Outline planning permission (with all matters reserved except access) for commercial development, accesses and roads, parking, associated services, infrastructure, earthworks and landscaping - Full planning permission for the erection of a | Soils:<br>Construction works should follow good practice in relation to soil handling and reinstatement where applicable.<br>Impact on agricultural land, some of which has the potential to be best and most versatile land. | Soils: No cumulative effects likely during operational phase; impacts assessed at construction phase. | Soils - **Very Large Adverse** and **significant effect** (Construction)<br><br>Soils - Neutral and not significant effect (Operation) |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 | | | | |
|---|---|---|---|---|---|---|
| | | | manufacturing facility, associated parking, services, infrastructure, landscaping and earthworks | | | |
| | | Land at Town Road Cliffe Woods. Rochester Medway ME3 8JL<br>- Reference: MC/19/0287<br>(approximately 3.2km from Order Limits and 2.5km from ARN)<br>Medway Council area | Outline planning permission with some matters reserved (appearance landscaping layout and scale) for up to 225 residential dwellings including up to 25% affordable housing, introduction of structural planting and landscaping, informal public open space and children's play area, surface water flood mitigation and attenuation, vehicular access point from Town Road and associated ancillary works. | Soils:<br>Construction works should follow good practice in relation to soil handling and reinstatement where applicable.<br>Impact on agricultural land, some of which has the potential to be best and most versatile land. | Soils: No cumulative effects likely during operational phase; impacts assessed at construction phase. | Soils - **Very Large Adverse** and **significant effect** (Construction)<br><br>Soils - Neutral and not significant effect (Operation) |
| 6.1 Environmental | New environmental information - not errata. | No amendment to ES Chapter 16 [**APP-154**] is proposed. | | | | |

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td>Statement - Chapter 16 - Cumulative Effects Assessment<br>[APP-154]</td><td>An update to the inter-project effects assessment presented in ES Chapter 16 has been undertaken to identify new developments (and new relevant information on developments previously considered) that have come forward since the inter-project effects cut-off date of 31 May 2022. This update has identified additional significant effects to those reported to date for the DCO application.</td><td>The new environmental information on additional significant effects identified through this assessment update is presented in Appendix B of the ES Addendum document.</td></tr>
<tr><td>6.1 Environmental Statement - Chapter 17 - Summary<br>[APP-155]</td><td>The Chapter 17 summary requires updating to reflect the various ES updates set out within this ES Addendum.</td><td>ES Chapter 17 is amended to reflect the various ES updates set out within this ES Addendum.<br><br>The first column of Table 17.2 on page 9 of ES Chapter 17 is amended to:<br><br>Table 17.2 Summary of likely significant effects detailed in Chapter 6: Cultural Heritage
<table>
<tr><th>Receptors</th></tr>
<tr><th>Chapter 6: Cultural Heritage</th></tr>
<tr><th>North of the River Thames</th></tr>
<tr><td>~~54~~ 56 non-designated medium-value archaeological assets (29, 104, 117, 219, 342, 356, 442, 482, 595, 643, 3553, 3567, 3572, 3575, 3589, 3592, 3594, 3598, 3601 3619, 3624, 3627, 3670, 3671, 3675, 3677, 3682, 3713, 3722, 3723, 3726, 3729, 3732, 3733, 3820, 3835, 3836, 3841, 3848, 3870, 3902, 3903, 3904, 3905, 3906, 3907, 3908, 3914, 3916, 3918, 3920, 3926, 3936, 3940, 3959, 4763)</td></tr>
</table></td></tr>
</table>

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | Changes to the first column of Table 17.3 of ES Chapter 17 is amended as follows:<br>Visual effects – South of the River Thames. Section references are set out in ES Fig 2.4 (Environmental Masterplan)<br>Construction (as identified in column 3):<br>*Section 3 and 4 (page 23)*<br>• Row for Very large adverse: 1 Representative Viewpoint~~s~~, 1 Residential receptor or group<br><br>Visual effects – North of the River Thames<br>Construction:<br>*Section 9 (page 25)*<br>• Row for Moderate adverse: 2 Representative Viewpoints, 2 Residential receptors or groups, 2 Recreational routes or groups, 2 Transport routes or groups, ~~1~~ 2 Other receptor~~s~~ or group~~s~~<br><br>*Section 11 (page 26)*<br>• Row for Large adverse: 7 Representative Viewpoints, ~~13~~ 14 Residential receptors or groups, 1 Recreational route or group, 6 Transport routes or groups, 2 Other receptors or groups<br>• Row for Moderate adverse: 3 Representative Viewpoints, 8 Residential receptors or groups, 2 Transport routes or groups, ~~3~~ 4 Other receptors or groups<br><br>Visual effects – North of the River Thames<br>Operation (as identified in column 3):<br>*Section 11 (page 43)*<br>• Row for Large adverse effect in opening year reducing to moderate adverse effect in design year: 4 Representative Viewpoints, ~~6~~ 7 Residential receptors or groups, 2 Transport routes or groups, 1 Other receptor or group<br>Moderate adverse effect in opening year reducing to slight adverse effect in design year: 5 Representative Viewpoints, 6 Residential receptors or groups, 2 Recreational routes or groups, 4 Transport routes or groups, ~~1~~ 2 Other receptors or groups |

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td></td><td></td><td>
The second column of the ‘Private property and housing' north of the River Thames row in Table 17.8 is amended as follows; with no amendment to the associated columns.
<br><br>
Table 17.8 Summary of likely significant effects detailed in Chapter 13: Population and Human Health
<table>
<tr><th colspan="2">Land use and accessibility effects – North of the River Thames</th></tr>
<tr><td>Receptors</td><td>Description of impact</td></tr>
<tr><td>Private property and housing</td><td>Demolition of ~~26~~31 properties north of the River Thames as follows:<br>• 7, 8, 9 and 10 Woolings Close, Baker Street<br>• 5 and 6 Woolings Row, Baker Street<br>• Murrells Cottage, Stanford Road<br>• Thatched Cottage, Baker Street<br>• Gammon Staples Farmhouse, Baker Street<br>• The Thatches, Stanford Road<br>• 1 and 2 Grays Corner Cottage, Baker Street<br>• ~~1–2 Whitfield Cottages~~ Whitfield Cottage, Barn View and Stable View, Stifford Clays Road<br>• 1–4 Bridge Cottages, Ockendon Road<br>• Larwood Cottage, Ockendon Road<br>• The Rosary, Ockendon Road<br>• ~~Yellow Stock Mews,~~1-5 Yellow Stock Mews, Ockendon Road<br>• Estate House, Ockendon Road<br>• 1–2 Cherry Orchard Cottages, Ockendon Road<br>• Alde Cottage<br>• Welcome Service Station (residential)<br>The impact on these private properties, which are defined as being of very high sensitivity, would be of major magnitude.</td></tr>
</table>
</td></tr>
</table>

## 2.3 Deadline 2 updates

2.3.1 Table 2.3 outlines amendments which have been identified through pre-examination and examination in relation to the chapters of the Environmental Statement and are submitted to the Examining Authority at Deadline 2 (3 August 2023).

**Table 2.3 Environmental Statement chapter updates – Deadline 2**

| Document reference | Reason for amendment | Environmental Statement amendment 3 August 2023 |
|---|---|---|
| Document reference Reason for amendment Environmental Statement amendment 3 August 20236.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [APP-146] | Paragraphs 8.4.54 and 8.4.59 require revision to remove reference to a record of a barbastelle bat which has been reassessed and determined to have been identified inaccurately. The call associated with this bat has now been attributed to common pipistrelle. | Paragraph 8.4.54 of ES Chapter 8 is amended to:<br>Bat surveys recorded a minimum of ~~seven~~ six species within the ZoI. ~~The confirmation of barbastelle *Barbastella barbastellus* onsite was from a single pass during a transect survey in Brewers Wood and is considered to be a single individual foraging or commuting and is not expected to regularly occur within the study area given the single record. This is the only Annex II species recorded onsite.~~<br><br>Paragraph 8.4.59 of ES Chapter 8 is amended to:<br>Over 90% of bat activity onsite was from common species with the remaining being rarer species. No maternity roosts were identified onsite and the hibernation roosts onsite only contained low numbers of bats. ~~Although barbastelle was recorded, this was a single pass.~~ The hibernation roost of small Myotis species was considered likely to be the more widespread and common whiskered *Myotis mystacinus* or Brandt's bats *Myotis brandti*. The bat population within the ZoI to the south of the River Thames could form a critical part of the county population, and as such is of county importance. |
| 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [APP-146] | Paragraph 8.9.3 requires revision to correct an error in the figure quoted for the extent of ancient woodland loss. It says 7.62ha which is wrong and inconsistent with other figures in the chapter that report the extent of this loss. | Paragraph 8.9.3 of ES Chapter 8 is amended to:<br><br>Potential significant effects as a result of construction include habitat loss within statutory and non-statutory designated sites, including the loss of ~~7.62ha~~ 6.92ha of ancient woodland, permanent loss of ancient and veteran trees and habitat loss and mortality of terrestrial invertebrate assemblages. During the operational phase of the Project, the significant effects are associated with the increase in nitrogen deposition on designated sites which has the potential to result in a degradation of habitat condition. Twenty-nine designated sites have been predicted to experience impacts which could lead |

| Document reference | Reason for amendment | Environmental Statement amendment 3 August 2023 |
|---|---|---|
| | | to an effect on the site's integrity, and would be considered significant. These consist of four SSSI, 22 ancient woodlands, two LWS and one SINC. |
| 6.1 Environmental Statement – All chapters [APP-138 to APP-155] | A review has been undertaken of the Applicant's position regarding the significance of effects from the use of a single tunnel boring machine (TBM) rather than two TBMs. | No amendment to the ES chapters is proposed for Deadline 2 related to the use of a single TBM methodology. The assessments presented in the Environmental Statement as submitted are representative of both scenarios.<br>A technical note has been prepared to report on the potential for differences in significance of environmental effects if a single TBM methodology were implemented as opposed to the two TBM methodology assessed in the ES.<br>This technical note is presented in Appendix C of this ES Addendum. |
| 6.1 Environmental Statement – All chapters [APP-138 to APP-155] | A review has been undertaken of potential changes to significant environmental effects associated with a proposed two-year rephasing of construction in response to the Ministerial Statement issued on 9 March 2023. | No amendment to the ES is proposed for Deadline 2 in relation to the rephasing of construction. The assessments presented in the Environmental Statement as submitted reflects a worst-case scenario and accommodates a proportionate degree for flexibility around the timing of construction, which would allow for the two-year rephasing of construction.<br>A technical note has been prepared to report on the potential for changes to environmental effects in comparison with those reported within the ES.<br>This technical note is presented in Appendix D of this ES Addendum. |

# 3 Environmental Statement figure updates

## 3.1 Section 51 submission December 2022

3.1.1 Table 3.1 outlines amendments which have been identified since submission of the DCO application in relation to the various figures of the Environmental Statement. These amendments were reported within the Errata Report (Version 1.0) [**AS-004**] published by the Examining Authority on 22 December 2022.

**Table 3.1 Environmental Statement figure updates December 2022**

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| 6.2 Environmental Statement - Figure 2.2 - Project Proposals [**APP-157**] | Figure 2.2 requires amendment to make corrections to legend | Figure 2.2 is amended as follows:<br>The legend item 'Proposed nitrogen deposition compensation planting' has been amended to more accurately reflect the symbology used in the map.<br>The 'route alignment' and 'earthworks' legend items have been moved from the end (far right) of the legend to the front of the legend (far left) to be consistent with other ES figures.<br><br>Resubmitted in December 2022 as:<br>Additional Submission - 6.2 Environmental Statement - Figure 2.2 - Project Proposals (Version 2) - Accepted at the discretion of the Examining Authority [**AS-046**] |
| 6.2 Environmental Statement - Figure 10.2 - Soil Scape Mapping [**APP-300**] | Figure 10.2 requires reissuing due to corruption issue with Version 1, which opened with error message | Figure 10.2 is amended to resolve error message.<br><br>Resubmitted in December 2022 as:<br>Additional Submission - 6.2 Environmental Statement - Figure 10.2 - Soil Scape Mapping (Version 2) - Accepted at the discretion of the Examining Authority [**AS-047**] |

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| 6.2 Environmental Statement - Figure 14.4 - Bedrock Aquifer Designations [APP-325] | Figure 14.4 requires reissuing due to corruption issue with Version 1, which opened with error message | Figure 14.4 is amended to resolve error message.<br><br>Resubmitted in December 2022 as:<br>Additional Submission - 6.2 Environmental Statement - Figure 14.4 - Bedrock Aquifer Designations (Version 2) - Accepted at the discretion of the Examining Authority [AS-048] |

## 3.2 Deadline 1 updates

3.2.1 Table 3.2 outlines amendments which have been identified through pre-examination and examination in relation to the various figures that accompany the Environmental Statement and were submitted to the Examining Authority at Deadline 1 (18 July 2023).

3.2.2 In addition to the amendments described in Table 3.2, general presentational updates have been made to the legend for each of these figures and their associated sheets. These minor typing updates such as adjustments to capitalisations and singular/plural amendments are not documented separately for each figure in Table 3.2 below.

**Table 3.2 Environmental Statement figure updates – Deadline 1**

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| 6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (1 of 2) [APP-178]<br><br>6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (2 of 2) [APP-179] | Figure 5.5 requires amendment to improve clarity of receptor LTC731 and its label away from the edge of the page.<br>Specifically, this relates to pages 17, 40 and 63 of Figure 5.5 (1 of 2) and pages 86, 109 and 132 of Figure 5.5 (2 of 2) | Figure 5.5 is amended to show location of receptor LTC731 clearly, this includes adjusting the scale from 1:10,000 to 1:15,000.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (1 of 2) (Clean) (Version 2) [REP1-118]<br><br>6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (1 of 2) (Tracked) (Version 2) [REP1-119] |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | 6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (2 of 2) (Clean) (Version 2) [**REP1-121**]<br><br>6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (2 of 2) (Tracked) (Version 2) [**REP1-120**] |
| 6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (1 of 2) [**APP-192**]<br><br>6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (2 of 2) [**APP-193**] | Figure 6.6 requires amendment to resolve the omission of a number of summer and winter heritage viewpoints. | Figure 6.6 is amended to include omitted summer and winter views.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (1 of 2) (Clean) (Version 2) [**REP1-123**]<br><br>6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (1 of 2) (Tracked) (Version 2) [**REP1-122**]<br><br>6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (2 of 2) (Clean) (Version 2) [**REP1-125**]<br><br>6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (2 of 2) (Tracked) (Version 2) [**REP1-124**] |
| 6.2 Environmental Statement – Figure 7.4 – Landscape Designations [**APP-200**] | Figure 7.4 requires amendment to remove the football pitches removed from the extent of Southern Valley Golf Club. | Figure 7.4 is amended to show the updated Southern Valley Golf Club extent and labelling.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 7.4 – Landscape Designations (Clean) (Version 2) [**REP1-126**]<br><br>6.2 Environmental Statement – Figure 7.4 – Landscape Designations (Tracked) (Version 2) [**REP1-127**] |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| 6.2 Environmental Statement – Figure 7.16 – Visual Effects Drawing with Representative Viewpoint and Photomontage Locations<br>[APP-234] | Figure 7.16 requires amendment to show additional identified visual receptors and associated assessment scores. | Figure 7.16 is amended to include omitted visual receptors and visual impact assessment scores.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 7.16 – Visual Effects Drawing with Representative Viewpoint and Photomontage Locations (Clean) (Version 2) [REP1-128]<br><br>6.2 Environmental Statement – Figure 7.16 – Visual Effects Drawing with Representative Viewpoint and Photomontage Locations (Tracked) (Version 2) [REP1-129] |
| 6.2 Environmental Statement – Figure 7.19 – Photomontages – Winter Year 1 and Summer Year 15 (2 of 4)<br>[APP-245] | Figure 7.19 requires amendment to address discrepancies identified between the anticipated appearance of the Project based on the DCO design and the appearance of the Project presented on the DCO application version of ES Figure 7.19. This was in relation to:<br>• Topsoil cover and grass establishment across the Chalk Park hilltop landform<br>• The chalk substrate along the upper edges of the South Portal approach road cutting<br>• Vegetation removal at Southern Valley Golf Club and Gravesend Golf Centre | Figure 7.19 is amended to address discrepancies in the photomontages for Representative Viewpoints S-33 and S-38b.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement - Figure 7.19 - Photomontages - Winter Year 1 and Summer Year 15 (2 of 4) (Clean) (Version 2) [REP1-131]<br><br>6.2 Environmental Statement - Figure 7.19 - Photomontages - Winter Year 1 and Summer Year 15 (2 of 4) (Tracked) (Version 2) [REP1-130] |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | • The form of proposed hedgerow and scrub planting<br>• The alignment of the proposed recreational routes | |
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (6 sheets) [**APP-248 to APP-253**] | Figure 7.20.1 requires amendment to correct the predicted traffic flows shown along some roads. | Figure 7.20.1 is amended to correct the predicted traffic flows shown along some roads.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (6 Sheets) (Clean) (Version 2) [**REP1-133**]; [**REP1-135**]; [**REP1-136**]; [**REP1-138**]; [**REP1-141**]; [**REP1-143**]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (6 Sheets) (Tracked) (Version 2) [**REP1-132**]; [**REP1-134**]; [**REP1-137**]; [**REP1-139**]; [**REP1-140**]; [**REP1-142**] |
| 6.2 Environmental Statement – Figure 7.20.2 – Traffic effects on the Kent Downs AONB during operational year 2030 and 2045 [**APP-254**] | Figure 7.20.2 requires amendment to correct the predicted traffic flows shown along some roads. | Figure 7.20.2 is amended to correct the predicted traffic flows shown along some roads.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 7.20.2 – Traffic effects on Kent Downs AONB during operational year 2030 and 2045 (Clean) (Version 2) [**REP1-144**]<br><br>6.2 Environmental Statement – Figure 7.20.2 – Traffic effects on Kent Downs AONB during operational year 2030 and 2045 (Tracked) (Version 2) [**REP1-145**] |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| 6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (2 Sheets) [APP-259 and APP-260] | Figure 7.23 requires amendment to show potential veteran trees previously not shown. | Figure 7.23 is amended to include omitted potential veteran trees.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (2 Sheets) (Clean) (Version 2) [REP1-147]; [REP1-149]<br><br>6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (2 Sheets) (Tracked) (Version 2) [REP1-146]; [REP1-148] |
| 6.2 Environmental Statement – Figure 7.24 – Tree Removal and Retention Plan [APP-261] | Figure 7.24 requires amendment to show potential veteran trees previously not shown. | Figure 7.24 is amended to include omitted potential veteran trees.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 7.24 – Tree Removal and Retention Plan (Clean) (Version 2) [REP1-151]<br><br>6.2 Environmental Statement – Figure 7.24 – Tree Removal and Retention Plan (Tracked) (Version 2) [REP1-150] |
| 6.2 Environmental Statement – Figure 11.1 – Active Landfill and Waste Transfer and Treatment [APP-308] | Figure 11.1 requires amendment to incorporate omitted active landfill sites. | Figure 11.1 is amended to include omitted active landfill sites.<br><br>Resubmitted in July 2023 as:<br>6.2 Environmental Statement – Figure 11.1 – Active Landfill and Waste Transfer and Treatment (Clean) (Version 2) [REP1-152]<br><br>6.2 Environmental Statement – Figure 11.1 – Active Landfill and Waste Transfer and Treatment (Tracked) (Version 2) [REP1-153] |
| 6.2 Environmental Statement – Figure 13.3 – Population and Human Health Assessment - | Figure 13.3 requires amendment to remove the 'Private building access significantly impacted/ | Figure 13.3 is amended to show only properties requiring demolition.<br><br>Resubmitted in July 2023 as: |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| Properties and Businesses at Risk of Demolition [APP-319] | building affected' layer which is a redundant dataset. | 6.2 Environmental Statement – Figure 13.3 – Population and Human Health Assessment - Properties and Businesses at Risk of Demolition (Clean) (Version 2) [REP1-154]<br><br>6.2 Environmental Statement – Figure 13.3 – Population and Human Health Assessment - Properties and Businesses at Risk of Demolition (Tracked) (Version 2) [REP1-155] |

## 3.3 Deadline 2 updates

3.3.1 Table 3.3 outlines amendments which have been identified through pre-examination and examination in relation to the various figures that accompany the Environmental Statement and are submitted to the Examining Authority at Deadline 2 (3 August 2023).

**Table 3.3 Environmental Statement figure updates – Deadline 2**

| Document reference | Reason for amendment | Environmental Statement amendment 3 August 2023 |
|---|---|---|
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [APP-159, APP-160, APP-161, APP-163, APP-164, APP-165, APP-166, APP-167 and APP-168] | Figure 2.4 – Environmental Masterplan requires amendment to address omission of proposed retaining walls on Environmental Masterplan sheets. | Figure 2.4 – Environmental Masterplan is amended to show proposed retaining walls added to the following sheets only:<br><br>South of River Thames<br>• Section 1: Sheet 1, 2 and 3<br>• Section 2: Sheet 1, 2, 3, 5 and 6<br>• Section 3: Sheet 1, 2 and 3<br><br>North of River Thames<br>• Section 9: Sheet 1 & 2<br>• Section 10: Sheet 4 ,5 and 16<br>• Section 11: Sheet 1, 2, 3, 4, 6, 7, 8 and 14 |

| Document reference | Reason for amendment | Environmental Statement amendment 3 August 2023 |
|---|---|---|
| | | • Section 12: Sheet 5<br>• Section 13: Sheet 1, 2, 3, 4 and 5<br>• Section 14: Sheet 1, 2, 3, 4, 5 and 6<br><br>There are no updates to Section 1A and Section 4 of the Environmental Masterplan.<br><br>Resubmitted in August 2023 as:<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Sections 1 & 1A (1 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Sections 1 & 1A (1 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 2 (2 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 2 (2 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 3 (3 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 3 (3 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 9 (5 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 9 (5 of 10) (Tracked) (Version 2) |

| Document reference | Reason for amendment | Environmental Statement amendment 3 August 2023 |
|---|---|---|
| | | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 10 (6 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 10 (6 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 11 (7 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 11 (7 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 12 (8 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 12 (8 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 13 (9 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 13 (9 of 10) (Tracked) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 14 (10 of 10) (Clean) (Version 2)<br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 14 (10 of 10) (Tracked) (Version 2) |

# 4 Environmental Statement appendix updates

## 4.1 Section 51 submission December 2022

4.1.1 Table 4.1 outlines amendments which have been identified since submission of the DCO application in relation to the various appendices of the Environmental Statement. These amendments were reported within the Errata Report (Version 1.0) [**AS-004**] published by the Examining Authority on 22 December 2022.

**Table 4.1 Environmental Statement appendix updates December 2022**

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| 6.3 Environmental Statement - Appendix 2.1 – Construction Supporting Information [**APP-335**] | Plate 1.3 of Appendix 2.1 requires amendment to resolve inconsistency with Book of Plans Temporary Works Plans for the Southern tunnel entrance compound. | Plate 1.3 of ES Appendix 2.1 is amended to include revised compound layout.<br><br>Resubmitted in December 2022 as:<br>Additional Submission – 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information – (Clean) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-049**]<br><br>Additional Submission – 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information – (Tracked) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-050**] |
| 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information [**APP-335**] | Table 1.2 of Appendix 2.1 requires amendment to address errata in relation to compound naming. | Table 1.2 of ES Appendix 2.1 is amended to replace the text '~~Marlin Cross~~' with 'Marling Cross'. |
| 6.3 Environmental Statement – Appendix 6.7 – Geophysical Survey Reports (1 of 2) [**APP-360**] | Appendix 6.7 requires revision to include omitted appendix pages from page 9 onwards. | ES Appendix 6.7 is amended to include omitted pages.<br><br>Resubmitted in December 2022 as: |

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| | | 6.3 Environmental Statement – Appendix 6.7 – Geophysical Survey Reports (1 of 2) (Version 2) [**AS-051**] |
| 6.3 Environmental Statement – Appendix 6.9 – Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation [**APP-367**] | Paragraph 6.3.17 requires revision to include omitted text in relation to the potential effects of Kit's Coty and Blue Bell Hill on heritage assets. | Paragraph 6.3.17 of ES Appendix 6.9 is amended to:<br>These works will affect Heritage Assets 677, 762, 1331, 1398, 1454, 1599, 1998, 3535, 3640, 3642, 3643 and 3655. Additionally, the Nitrogen Deposition Compensation Site at Kit's Coty has the potential to affect Heritage Asset 4745. An appropriate mitigation technique has been identified for the sites affected and is set out in Table 9.1 and described in Chapter 7. Additionally, the nitrogen deposition compensation sites close to Kit's Coty, Burham and Blue Bell Hill, have the potential to affect Heritage Assets 4745, 4483, 4513, 4525, and 4760. |
| 6.3 Environmental Statement Appendix 6.10 – Assessment Tables [**APP-368**] | Tables 1.5 and 1.6 of Appendix 6.10 omitted to include rows of heritage asset data from appendix tables for submission as a result of a corruption issue. | ES Appendix 6.10 is amended to include multiple rows of missing heritage data.<br><br>Resubmitted in December 2022 as:<br>Additional Submission – 6.3 Environmental Statement – Appendix 6.10 – Assessment Tables – (Clean) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-052**]<br><br>Additional Submission – 6.3 Environmental Statement – Appendix 6.10 – Assessment Tables – (Tracked) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-053**] |
| 6.3 Environmental Statement – Appendix 7.8 – Technical Methodologies [**APP-383**] | Table 3.1 of Appendix 7.8 requires amendment to include entry for photomontage S-22 'View from Watling Street on the A2 overbridge', which was omitted in error. In addition, entries in the 'Photomontage view angle presentation' column | Table 3.1 of ES Appendix 7.8 is amended to include omitted entry for photomontage S-22 and corrected photomontage view angle presentation entries.<br><br>Resubmitted in December 2022 as:<br>6.3 Environmental Statement – Appendix 7.8 – Technical Methodologies – (Clean) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-054**] |

| Document reference | Reason for amendment | Environmental Statement amendment December 2022 |
|---|---|---|
| | in Table 3.1 of Appendix 7.8 requires correcting. | 6.3 Environmental Statement – Appendix 7.8 – Technical Methodologies – (Tracked) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-055**] |
| 6.3 Environmental Statement – Appendix 12.5 – Baseline Noise Survey Information [**APP-445**] | Paragraph 1.34 and Paragraph 1.35 of Appendix 12.5 require amendment to address errata in relation to road naming. | Paragraph 1.34 of ES Appendix 12.5 is amended to:<br>Survey position description<br>*Monitoring location adjacent to ~~Ackers Lane~~ Ackers Drive, Swanscombe, DA10 1AZ. Meter located at the bottom of embankment just north of Spring River hotel.*<br><br>Paragraph 1.35 of Appendix 12.5 is amended to:<br>Monitoring location description<br>~~*Queens Garden*~~ Queens Gardens*, Dartford, DA2 6HZ.* |
| 6.3 Environmental Statement – Appendix 14.5 – Hydrogeological Risk Assessment (Part 1 of 2) [**APP-458**] | Paragraph 3.9.6 required revision to correct area number. | Paragraph 3.9.6 of Appendix 14.5 is amended to:<br>Phase 1 habitat surveys, compared with UKTAG WTT habitat types, identified potential groundwater dependent habitats in a number of small ditches, watercourse margins and ponds. South of the River Thames, Jeskyns Community Woodland car park was identified as having a swamp habitat. North of the River Thames, identified areas were Cooper Shaw Road ditch, two small areas in Tilbury and ~~four~~ small areas in North Ockendon Pit SINC. |

## 4.2 Deadline 1 updates

4.2.1 Table 4.2 outlines amendments which have been identified through pre-examination and examination in relation to the appendices of the Environmental Statement and were submitted to the Examining Authority at Deadline 1 (18 July 2023).

**Table 4.2 Environmental Statement appendix updates – Deadline 1**

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| 6.3 Environmental Statement – Appendix 5.3 – Air Quality Construction Phase Results [**APP-347**] | Tables 3.4, 3.5 and 3.6 of Appendix 5.3 included erroneous data for NO2 concentrations in 2028, 2029 and 2030. | Tables 3.4, 3.5 and 3.6 of ES Appendix 5.3 are amended to include the corrected NO2 data.<br><br>Resubmitted in July 2023 as:<br>6.3 Environmental Statement – Appendix 5.3 – Air Quality Construction Phase Results (Clean) (Version 2) [**REP1-161**]<br><br>6.3 Environmental Statement – Appendix 5.3 – Air Quality Construction Phase Results (Tracked) (Version 2) [**REP1-160**] |
| 6.3 Environmental Statement – Appendix 6.10 – Assessment Tables (Version 2) [**AS-052** and **AS-053**] | Table 1.14 of Appendix 6.10 requires amendment to construction impact for Asset 2461. | Table 1.14 of ES Appendix 6.10 (Version 2) is amended as follows:<br><br>Table 1.14: Non-designated archaeology within the Order Limits assessment table: South of the River Thames of Appendix 6.10 is amended to change the reported construction impact on Asset 2461 from ~~Moderate~~ to Minor. |
| 6.3 Environmental Statement – Appendix 6.13 – Holocene Geoarchaeological Desk-based Assessment of the Route of the Lower Thames Crossing [**APP-371**] | Appendix 6.13 requires amendment to correct the photograph referencing. | Figure 4 of ES Appendix 6.13 is amended to correct the photograph numbering as follows:<br><br>~~B:~~ C: Saxon mill, Ebbsfleet buried in alluvium;<br>~~C:~~ B: pottery and wood on Roman foreshore at Ebbsfleet; |
| 6.3 Environmental Statement – Appendix 7.7 | Table 3.1 and Table 3.2 of Appendix 7.7 requires | Table 3.1 and Table 3.2 of ES Appendix 7.7 are amended as follows: |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| – Representative Viewpoint and Visual Receptor Baseline Descriptions and Visual Sensitivity<br>[APP-382] | amendment to incorporate the identification of additional visual receptors since submission of the DCO application. | Section 3 Visual receptor baseline descriptions and visual sensitivity<br>Additions to Table 3.1 (south of the River Thames):<br>• VR-S03-R-035 Polperro, A226 Rochester Road:<br>– Approximate distance from the Project route centreline (km): 0.45km<br>– Approximate number of residential receptors: 1<br>– Visual sensitivity: High<br>– Winter baseline view commentary: Close-range to mid-range views west, south and east, partially filtered by boundary vegetation, look out across arable land and occasional hedgerows within the Order Limits. Tree belts at Gravesend Golf Centre are visible in the midground to the south, with the tops of pylons apparent to the south-east. There are long-range views south-east towards woodland at Shorne village and within Shorne Woods Country Park.<br>– Summer baseline view commentary: Further filtering as a result of foreground boundary vegetation.<br>• VR-S03-O-007 Thamesview School, Thong Lane, Gravesend:<br>– Approximate distance from the Project route centreline (km): 0.8km<br>– Approximate number of residential receptors: N/A<br>– Visual sensitivity: Moderate<br>– Winter baseline view commentary: Mid-range glimpses east and north-east, densely filtered by vegetation at the Thamesview School playing fields, to arable land within the Order Limits and tree belts at Gravesend Golf Centre. Narrow long-range views north-east towards the River Thames and north bank beyond.<br>– Summer baseline view commentary: Further screening as a result of vegetation at the Thamesview School playing fields.<br>Additions to Table 3.2 (north of the River Thames):<br>• VR-S11-R-043 Five Chimney Cottages, A1013 Stanford Road:<br>– Approximate distance from the Project route centreline (km): 0.4km |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | – Approximate number of residential receptors: 4<br>– Visual sensitivity: Moderate<br>– Winter baseline view commentary: Close-range views south and south-east to the A1013 Stanford Road within the Order Limits, with long-range views across fields towards pylons in the midground and high-rise buildings at the edge of Chadwell St Mary densely filtered by roadside vegetation. Mid-range, open views north and north-west to tree belts, highway infrastructure and moving vehicles along the A13 corridor and the A13 to A1089 slip road. The A13 embankment restricts long-range views.<br>– Summer baseline view commentary: Further screening as a result of vegetation in the foreground to the south and the midground to the north.<br>• VR-S09-O-007 Condovers Scout Activity Centre, Church Road, West Tilbury:<br>– Approximate distance from the Project route centreline (km): 0.5km<br>– Approximate number of residential receptors: N/A<br>– Visual sensitivity: Moderate<br>– Winter baseline view commentary: Close-range to long-range views south and south-east, generally enclosed by vegetation and buildings within the grounds and the adjoining landscape, to low-lying land on the north bank of the River Thames, including landform changes associated with restoration works at Ash Fields. Pylons and overhead lines associated with the Tilbury Loop railway line are prominent. From parts of the activity centre, there are distant views south towards the River Thames estuary valley and rising ground beyond.<br>– Summer baseline view commentary: Further screening as a result of vegetation within the grounds of the activity centre and the adjoining landscape.<br>• VR-S11-O-011 Orsett Heath Academy, Grays, adjacent to Thurrock Rugby Football Club:<br>– Approximate distance from the Project route centreline (km): 0.6km<br>– Approximate number of residential receptors: N/A<br>– Visual sensitivity: Moderate |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | – Winter baseline view commentary: Close-range to mid-range, open views north-east over rugby fields at Thurrock Rugby Club and arable land within the Order Limits. Pylons are prominent in the midground, with floodlights in the foreground at the rugby fields. There are also mid-range views east towards the A1013 Stanford Road within the Order Limits, screened by roadside planting, and Gammonfields Way.<br>– Summer baseline view commentary: Further screening as a result of roadside vegetation in the midground to the east. |
| 6.3 Environmental Statement – Appendix 7.10 – Schedule of Visual Effects<br>[**APP-385**] | Appendix 7.10 requires amendment to incorporate the identification of additional visual receptors since submission of the DCO application. | Table 2.2, Table 2.4, Table 3.2 and Table 3.4 of ES Appendix 7.10 are amended as follows:<br><br><u>Section 2 Construction</u><br>Additions to Table 2.2 Schedule of visual effects for visual receptors south of the River Thames during construction:<br>• VR-S03-R-035 Polperro, A226 Rochester Road:<br>– Sensitivity: High<br>– Magnitude of visual effect: Major<br>– Significance of effect: Very large adverse effect<br>• VR-S03-O-007 Thamesview School, Thong Lane, Gravesend:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect: Minor<br>– Significance of effect: Slight adverse effect<br>Additions to Table 2.4 Schedule of visual effects for visual receptors north of the River Thames during construction:<br>• VR-S11-R-043 Five Chimney Cottages, A1013 Stanford Road:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect: Major<br>– Significance of effect: Large adverse effect |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | • VR-S09-O-007 Condovers Scout Activity Centre, Church Road, West Tilbury:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect: Moderate<br>– Significance of effect: Moderate adverse effect<br>• VR-S11-O-011 Orsett Heath Academy, Grays, adjacent to Thurrock Rugby Football Club:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect: Moderate<br>– Significance of effect: Moderate adverse effect<br><br><u>Section 3 Operation</u><br>Additions to Table 3.2 Schedule of visual effects for visual receptors south of the River Thames during operation:<br>• VR-S03-R-035 Polperro, A226 Rochester Road:<br>– Sensitivity: High<br>– Magnitude of visual effect in opening year (winter): Minor<br>– Significance of effect in opening year (winter): Slight adverse effect<br>– Magnitude of visual effect in design year (summer): Minor<br>– Significance of effect in design year (summer): Slight adverse effect<br>– Figure 2.4 Environmental Masterplan reference: Highway Section 3<br>• VR-S03-O-007 Thamesview School, Thong Lane, Gravesend:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect in opening year (winter): Negligible<br>– Significance of effect in opening year (winter): Slight adverse effect<br>– Magnitude of visual effect in design year (summer): Negligible<br>– Significance of effect in design year (summer): Slight adverse effect<br>– Figure 2.4 Environmental Masterplan reference: Highway Section 3 |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | Additions to Table 3.4 Schedule of visual effects for visual receptors north of the River Thames during operation:<br>• VR-S11-R-043 Five Chimney Cottages, A1013 Stanford Road:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect in opening year (winter): Major<br>– Significance of effect in opening year (winter): Large adverse effect<br>– Magnitude of visual effect in design year (summer): Moderate<br>– Significance of effect in design year (summer): Moderate adverse effect<br>– Figure 2.4 Environmental Masterplan reference: Highway Section 11<br>• VR-S09-O-007 Condovers Scout Activity Centre, Church Road, West Tilbury:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect in opening year (winter): Minor<br>– Significance of effect in opening year (winter): Slight adverse effect<br>– Magnitude of visual effect in design year (summer): Minor<br>– Significance of effect in design year (summer): Slight adverse effect<br>– Figure 2.4 Environmental Masterplan reference: Highway Section 9<br>• VR-S11-O-011 Orsett Heath Academy, Grays, adjacent to Thurrock Rugby Football Club:<br>– Sensitivity: Moderate<br>– Magnitude of visual effect in opening year (winter): Moderate<br>– Significance of effect in opening year (winter): Moderate adverse effect<br>– Magnitude of visual effect in design year (summer): Minor<br>– Significance of effect in design year (summer): Slight adverse effect<br>– Figure 2.4 Environmental Masterplan reference: Highway Section 11 |
| 6.3 Environmental Statement – Appendix 7.11 – Traffic and Noise | Assessment in Appendix 7.11 requires amendment to reflect corrections to some predicted | Assessment in ES Appendix 7.11 is amended to reflect revised supporting figures (as detailed in Table 3.2 of this ES Addendum). |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| Effects on the Kent Downs AONB [APP-386] | traffic flows shown on traffic maps in supporting figures (Figure 7.20.1 & 7.20.2). | Resubmitted in July 2023 as:<br>6.3 Environmental Statement – Appendix 7.11 – Traffic and Noise Effects on the Kent Downs AONB (Clean) (Version 2) [REP1-162]<br><br>6.3 Environmental Statement – Appendix 7.11 – Traffic and Noise Effects on the Kent Downs AONB (Tracked) (Version 2) [REP1-163] |
| 6.3 Environmental Statement – Appendix 10.11 – Remediation Options Appraisal and Outline Remediation Strategy [APP-434] | Appendix 10.11 requires amendment to address a small number or minor errors in existing text, including reference to REAC item which does not exist. | ES Appendix 10.11 is amended to correct minor errors.<br><br>Resubmitted in July 2023 as:<br>6.3 Environmental Statement – Appendix 10.11 – Remediation Options Appraisal and Outline Remediation Strategy (Clean) (Version 2) [REP1-165]<br><br>6.3 Environmental Statement – Appendix 10.11 – Remediation Options Appraisal and Outline Remediation Strategy (Tracked) (Version 2) [REP1-164] |
| 6.3 Environmental Statement – Appendix 11.3 List of Third party Offsite Waste Infrastructure Receptors [APP-437] | Table 1.1 of Appendix 11.3 is incomplete and requires amendment to incorporate information on all active landfills within the study area. | Table 1.1 of ES Appendix 11.3 is amended to include the omitted data.<br><br>Resubmitted in July 2023 as:<br>6.3 Environmental Statement – Appendix 11.3 List of Third party Offsite Waste Infrastructure Receptors (Clean) (Version 2) [REP1-166]<br><br>6.3 Environmental Statement – Appendix 11.3 List of Third party Offsite Waste Infrastructure Receptors (Tracked) (Version 2) [REP1-167] |
| 6.3 Environmental Statement – Appendix 12.4 – Construction Noise and Vibration Assessment [APP-444] | Table 2.5 of Appendix 12.4 included erroneous daily haulage movement data by construction phase. | Table 2.5 of ES Appendix 12.4 is amended to include the corrected haulage movement data by construction phase.<br><br>Resubmitted in July 2023 as:<br>6.3 Environmental Statement – Appendix 12.4 – Construction Noise and Vibration Assessment (Clean) (Version 2) [REP1-169] |

<table>
<tr><th>Document reference</th><th>Reason for amendment</th><th>Environmental Statement amendment July 2023</th></tr>
<tr><td></td><td></td><td>6.3 Environmental Statement – Appendix 12.4 – Construction Noise and Vibration Assessment (Tracked) (Version 2) [REP1-168]</td></tr>
<tr><td>6.3 Environmental Statement – Appendix 14.5 – Hydrogeological Risk Assessment (Part 2 of 2)<br>[APP-459]</td><td>Table 1.6 in Annex Q Utilities assessment (groundwater) of Appendix 14.5 requires amendment to provide missing text.</td><td>Table 1.6 in Annex Q of ES Appendix 14.5 is amended as follows:<br><br>Table 1.6 Main trenchless sections of utilities – north of the River Thames
<table>
<tr><th>Utility corridor section</th><th>Summary description of trenchless section [1]</th><th>Water resources[2, 4]</th><th>Residual significance (construction phase and operational phase) [REAC ref.]</th></tr>
<tr><td colspan="4">North of the River Thames (multi-utility):</td></tr>
<tr><td>Work number MU72 under the railway</td><td>Length of deep section:80m, maximum depth: 11m<br>Proposed utility construction method: Thrust bore trenchless method</td><td>SPZ3 [3]<br>Essex Gravels groundwater body<br>Fields south of Cranham Marsh SINC (50m west), Thames Chase Forest Centre SINC (250m north)</td><td>Not significant<br>[Following the precautionary principle. A Project commitment has been added, comprising ~~[REAC ref. - number to be confirmed]~~ [RDWE0056, which secures the reduction of temporary groundwater level lowering outside of the Order Limits by total or partial temporary exclusion of water flow into the shafts].</td></tr>
<tr><td>Work number MU73</td><td>Length of deep section: ~~[number to be confirmed]~~ approximately 370m.</td><td>SPZ3 [3]<br>Essex Gravels groundwater body</td><td>Not significant<br>[Following the precautionary principle. A Project</td></tr>
</table></td></tr>
</table>

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 | | | |
|---|---|---|---|---|---|
| | | | Alignment is beneath the London, Tilbury and Southend railway line, beneath the proposed A122 cutting and beneath the existing M25 cutting.<br>Proposed utility construction method: Large HDD trenchless method | Fields south of Cranham Marsh SINC (300m north west), Hall Farm moat, paddock and St Mary Magdalene Churchyard SINC (275m south east) | commitment has been added, comprising ~~[REAC ref. - number to be confirmed]~~ RDWE0057, which secures the reduction of groundwater lowering outside of the Order Limits by temporary total or partial exclusion of water flow into the pits]. |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment – Part 1 [**APP-460**]<br>Part 2 [**APP-461**]<br>Part 3 [**APP-462**]<br>Part 8 [**APP-467**]<br>Part 10 [**APP-477**] | The London Borough of Havering is incorrectly noted as acting as the Lead Local Flood Authority (LLFA) on behalf of Brentwood Borough Council in the following locations:<br>Part 1 paragraph 5.1.2,<br>Part 2 paragraph 4.1.4,<br>Part 3 paragraph 3.5.4,<br>Part 8 paragraph 4.4.4,<br>Part 10 footnote 2 (page 6) | Paragraphs identified are amended to:<br>~~The London Borough of Havering~~ Essex County Council is ~~acting as~~ the LLFA ~~on behalf of~~ for the area within the borough of Brentwood ~~Borough Council~~. | | | |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment - Part 6 [**APP-465**] | Part 6 Annex A – Calculations requires updating to include omitted calculation sheets. | Part 6 Annex A of ES Appendix 14.6 is amended to incorporate omitted calculation sheets.<br><br>Resubmitted in July 2023 as:<br>6.3 Environmental Statement – Appendix 14.6 Flood Risk Assessment - Part 6 (Clean) (Version 2) [**REP1-171**] | | | |

| Document reference | Reason for amendment | Environmental Statement amendment July 2023 |
|---|---|---|
| | | 6.3 Environmental Statement – Appendix 14.6 Flood Risk Assessment - Part 6 (Tracked) (Version 2) [**REP1-170**] |
| 6.3 Environmental Statement – Appendix 16.2 – Short List of Developments [**APP-484**] | Page 72 of the Shortlist Table of Appendix 16.2 requires amendment to correct data in two rows (relating to entries for Air Quality and Noise and Vibration) against Application Reference 22/00402/FUL Brentwood Enterprise Park.<br><br>The shortlist incorrectly identified the development as being included in the traffic model (through the inclusion of a 'Y' in column 5 on Page 72). Consequently, updates are required to the Air Quality and Noise assessment text in the associated rows of the Shortlist.<br>This has no change to residual significance of effects reported. | Entries against Application Reference 22/00402/FUL Brentwood Enterprise Park on Page 72 of ES Appendix 16.2 are amended to:<br><br>The '~~N~~' in column 5 is amended to 'Y'.<br><br>Air Quality text in column 8:<br>~~The are 4~~ There are 2 receptors near the proposed development site (LTC_Con_017 and LTC293) both of which show~~. With the traffic associated with this development included in the traffic model, all receptors show~~ modelled concentrations well below the AQS objective, indicating~~. This indicates~~ that cumulative impacts are unlikely to lead to exceedances of the AQS objective.<br><br>Air Quality text in column 9:<br>~~The are 4 receptors near the proposed development site. With the traffic associated with this development included in the traffic model, all receptors show modelled concentrations well below the AQS objective. This~~ The closest receptor to the proposed development site (LTC293) shows modelled concentrations well below the AQS objective, indicating ~~indicates~~ that cumulative impacts are unlikely to lead to exceedances of the AQS objective.<br><br>Noise and Vibration text in column 9:<br>~~The predicted traffic from the proposed development is included within the project traffic model and so any cumulative effects would be evident.~~ The operational road traffic noise assessment for the Project indicates negligible changes in road traffic noise levels across this application site. The traffic from the proposed development is unlikely to increase the traffic to a level that would be significant. |

## 4.3 Deadline 2 updates

4.3.1 Table 4.3 outlines amendments which have been identified through pre-examination and examination in relation to the appendices of the Environmental Statement and are submitted to the Examining Authority at Deadline 2 (3 August 2023).

**Table 4.3 Environmental Statement appendix updates – Deadline 2**

| Document reference | Reason for amendment | Environmental Statement amendment 3 August 2023 |
|---|---|---|
| 6.3 Environmental Statement - Appendix 8.8 – Bats [APP-397] | Paragraph 4.2.15 and 4.2.40 and Table 4.4 require revision to remove reference to a record of a barbastelle bat which has been reassessed and determined to have been identified inaccurately. The call associated with this bat has now been attributed to common pipistrelle. | Paragraph 4.2.15 of Appendix 8.8 is amended to:<br>At least ~~seven~~ six species (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, brown long-eared bat, and a *Myotis* spp. ~~and Barbastelle bats~~) were recorded during the surveys. ~~A single Barbastelle bat recording was identified from the walked survey of Transect 4 in October 2018, with no other recordings of this species identified.~~<br><br>Paragraph 4.2.40 of Appendix 8.8 is amended to:<br>The transect point activity surveys for Brewers Wood recorded a mean number of passes per night of 367 from the Pipistrelle species group, 61 from the Big bat species group and 24 from the Woodland bat species group. Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, *Nyctalus*/*Eptesicus* spp., ~~Barbastelle~~ and *Myotis* spp. were recorded on the walked transect activity surveys.<br><br>Table 4.4 of Appendix 8.8 is amended to remove the reference to barbastelle bat. This removal would not significantly alter the remaining data presented in this table. |

# 5 Environmental Statement Non-Technical Summary updates

## 5.1 Section 51 submission December 2022

5.1.1 No updates to the Environmental Statement Non-Technical Summary were made as part of the Section 51 submission in December 2022. For consistency of numbering of tables with Sections 2, 3 and 4 of this ES Addendum, Table 5.1 has been prepared with no entries shown.

**Table 5.1 Environmental Statement Non-Technical Summary updates December 2022**

| Reason for amendment | Non-Technical Summary amendment July 2023 |
|---|---|
| No updates | No updates |

## 5.2 Deadline 1 updates

5.2.1 Table 5.2 outlines where amendments which have been identified through pre-examination and examination in relation to the Environmental Statement chapters and their accompanying figures and appendices, resulted in a need to amend the content of the Environmental Statement – Non-Technical Summary (NTS) [**APP-486**] for Deadline 1 (18 July 2023).

**Table 5.2 Environmental Statement Non-Technical Summary updates – Deadline 1**

| Reason for amendment | Non-Technical Summary amendment July 2023 |
|---|---|
| Paragraph 3.3.6, bullet point e. requires revision to reflect the amendments made to ES Chapter 6: Cultural Heritage. | Paragraph 3.3.6, bullet point e. of the NTS is amended to:<br>e. Complete or partial removal of ~~54~~ 56 medium-value non-designated buried archaeological sites to the north of the River Thames. |
| Paragraph 3.11.10, bullet point a requires revision to reflect the amendments made to ES Chapter 13: Population and Human Health (and ES Chapter 2: Project Description) | Paragraph 3.11.10, bullet point a. of the NTS is amended to:<br>a. Permanent adverse effects on private property and housing as a result of demolition of ~~30~~ 35 properties, permanent acquisition of land from five properties and temporary possession of land from a further property. |

## 5.3 Deadline 2 updates

5.3.1 No updates to the Environmental Statement Non-Technical Summary were made as part of the Deadline 2 submission (3 August 2023). For consistency of numbering of tables with Sections 2, 3 and 4 of this ES Addendum, Table 5.3 has been prepared with no entries shown.

### Table 5.3 Environmental Statement Non-Technical Summary updates – Deadline 2

| Reason for amendment | Non-Technical Summary amendment 3 August 2023 |
|---|---|
| No updates | No updates |

# 6 Summary

## 6.1 Summary of documents updated

6.1.1 Table 6.1 provides a collated summary of the updates to Application Documents that are reported in this ES Addendum. Table 6.1 identifies the Application Documents that have been updated, and when, with a cross reference to where the relevant detail of the update can be found and references to new published versions, where relevant. Documents are listed in order of the Application Document numbering as identified in the Lower Thames Crossing Examination Library, which is a live document maintained by the Planning Inspectorate.

**Table 6.1 Summary of documents updated**

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| **ES chapters** | | | |
| 6.1 Environmental Statement – Chapter 2 – Project Description [**APP-140**] | Section 51 submission December 2022 | As identified in Table 2.1 | Document not re-issued. Updates identified in ES Addendum only |
| | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 6 – Cultural Heritage [**APP-144**] | Section 51 submission December 2022 | As identified in Table 2.1 | 6.1 Environmental Statement – Chapter 6 – Cultural Heritage – (Clean) (Version 2)[**AS-044**]<br><br>6.1 Environmental Statement – Chapter 6 – Cultural Heritage – (Tracked) (Version 2) [**AS-045**] |
| | Deadline 1 July 2023 | As identified in Table 2.2 | **AS-044** and **AS-045** as above.<br>Document not re-issued. Updates identified in ES Addendum only |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.1 Environmental Statement – Chapter 7 – Landscape and Visual [APP-145] | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 8 – Terrestrial Biodiversity [APP-146] | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| | Deadline 2 3 August 2023 | As identified in Table 2.3 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 9 – Marine Biodiversity [APP-147] | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 10 – Geology and Soils Health [APP-148] | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 13 – Population and Human Health [APP-151] | Section 51 submission December 2022 | As identified in Table 2.1 | Document not re-issued. Updates identified in ES Addendum only |
| | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 16 – Cumulative Effects Assessment [APP-154] | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.1 Environmental Statement – Chapter 17 – Summary [APP-155] | Deadline 1 July 2023 | As identified in Table 2.2 | Document not re-issued. Updates identified in ES Addendum only |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| **ES figures** | | | |
| 6.2 Environmental Statement – Figure 2.2 – Project Proposals [APP-157] | Section 51 submission December 2022 | As identified in Table 3.1 | 6.2 Environmental Statement – Figure 2.2 – Project Proposals (Version 2) [AS-046] |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [APP-159] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Sections 1 & 1A (1 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Sections 1 & 1A (1 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [APP-160] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 2 (2 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 2 (2 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [APP-161] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 3 (3 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 3 (3 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [APP-163] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 9 (5 of 10) (Clean) (Version 2) |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| | | | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 9 (5 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [**APP-164**] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 10 (6 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 10 (6 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [**APP-165**] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 11 (7 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 11 (7 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [**APP-166**] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 12 (8 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 12 (8 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [**APP-167**] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 13 (9 of 10) (Clean) (Version 2) |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| | | | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 13 (9 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan [**APP-168**] | Deadline 2<br>3 August 2023 | As identified in Table 3.3 | 6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 14 (10 of 10) (Clean) (Version 2)<br><br>6.2 Environmental Statement – Figure 2.4 – Environmental Masterplan Section 14 (10 of 10) (Tracked) (Version 2) |
| 6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (1 of 2) [**APP-178**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (1 of 2) (Clean) (Version 2) [**REP1-118**]<br><br>6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (1 of 2) (Tracked) (Version 2) [**REP1-119**] |
| 6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (2 of 2) [**APP-179**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (2 of 2) (Clean) (Version 2) [**REP1-121**]<br><br>6.2 Environmental Statement – Figure 5.5 – Construction Traffic Receptors and Results (2 of 2) (Tracked) (Version 2) [**REP1-120**] |
| 6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (1 of 2) [**APP-192**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (1 of 2) (Clean) (Version 2) [**REP1-123**] |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| | | | 6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (1 of 2) (Tracked) (Version 2) [**REP1-122**] |
| 6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (2 of 2) [**APP-193**] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (2 of 2) (Clean) (Version 2) [**REP1-125**]<br><br>6.2 Environmental Statement – Figure 6.6 Representative Heritage Viewpoints (2 of 2) (Tracked) (Version 2) [**REP1-124**] |
| 6.2 Environmental Statement – Figure 7.4 – Landscape Designations [**APP-200**] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.4 – Landscape Designations (Clean) (Version 2) [**REP1-126**]<br><br>6.2 Environmental Statement – Figure 7.4 – Landscape Designations (Tracked) (Version 2) [**REP1-127**] |
| 6.2 Environmental Statement – Figure 7.16 – Visual Effects Drawing with Representative Viewpoint and Photomontage Locations [**APP-234**] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.16 – Visual Effects Drawing with Representative Viewpoint and Photomontage Locations (Clean) (Version 2) [**REP1-128**]<br><br>6.2 Environmental Statement – Figure 7.16 – Visual Effects Drawing with Representative Viewpoint and Photomontage Locations (Tracked) (Version 2) [**REP1-129**] |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.2 Environmental Statement – Figure 7.19 – Photomontages – Winter Year 1 and Summer Year 15 (2 of 4) [**APP-245**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement - Figure 7.19 - Photomontages - Winter Year 1 and Summer Year 15 (2 of 4) (Clean) (Version 2) [**REP1-131**]<br><br>6.2 Environmental Statement - Figure 7.19 - Photomontages - Winter Year 1 and Summer Year 15 (2 of 4) (Tracked) (Version 2) [**REP1-130**] |
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (1 of 6)<br>[**APP-248**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (1 of 6) (Clean) (Version 2) [**REP1-133**]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (1 of 6) (Tracked) (Version 2) [**REP1-132**] |
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (2 of 6)<br>[**APP-249**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (2 of 6) (Clean) (Version 2) [**REP1-135**]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (2 of 6) (Tracked) (Version 2) [**REP1-134**] |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (3 of 6)<br>[**APP-250**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (3 of 6) (Clean) (Version 2)<br>[**REP1-136**]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (3 of 6) (Tracked) (Version 2)<br>[**REP1-137**]; |
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (4 of 6)<br>[**APP-251**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (4 of 6) (Clean) (Version 2)<br>[**REP1-138**]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (4 of 6) (Tracked) (Version 2)<br>[**REP1-139**] |
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (5 of 6)<br>[**APP-252**] | Deadline 1<br>July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (5 of 6) (Clean) (Version 2)<br>[**REP1-141**]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (5 of 6) (Tracked) (Version 2)<br>[**REP1-140**] |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on the Kent Downs AONB during construction (6 of 6) [APP-253] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (6 of 6) (Clean) (Version 2) [REP1-143]<br><br>6.2 Environmental Statement – Figure 7.20.1 – Traffic effects on Kent Downs AONB during construction (6 of 6) (Tracked) (Version 2) [REP1-142] |
| 6.2 Environmental Statement – Figure 7.20.2 – Traffic effects on the Kent Downs AONB during operational year 2030 and 2045 [APP-254] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.20.2 – Traffic effects on Kent Downs AONB during operational year 2030 and 2045 (Clean) (Version 2) [REP1-144]<br><br>6.2 Environmental Statement – Figure 7.20.2 – Traffic effects on Kent Downs AONB during operational year 2030 and 2045 (Tracked) (Version 2) [REP1-145] |
| 6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (1 of 2) [APP-259] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (1 of 2) (Clean) (Version 2) [REP1-147]<br><br>6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (1 of 2) (Tracked) (Version 2) [REP1-146] |
| 6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (2 of 2) [APP-260] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (2 of 2) (Clean) (Version 2) [REP1-149] |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| | | | 6.2 Environmental Statement – Figure 7.23 – Existing Tree Constraints Plan (2 of 2) (Tracked) (Version 2) [**REP1-148**] |
| 6.2 Environmental Statement – Figure 7.24 – Tree Removal and Retention Plan [**APP-261**] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 7.24 – Tree Removal and Retention Plan (Clean) (Version 2) [**REP1-151**]<br><br>6.2 Environmental Statement – Figure 7.24 – Tree Removal and Retention Plan (Tracked) (Version 2) [**REP1-150**] |
| 6.2 Environmental Statement - Figure 10.2 - Soil Scape Mapping [**APP-300**] | Section 51 submission December 2022 | As identified in Table 3.1 | Additional Submission - 6.2 Environmental Statement - Figure 10.2 - Soil Scape Mapping (Version 2) - Accepted at the discretion of the Examining Authority [**AS-047**] |
| 6.2 Environmental Statement – Figure 11.1 – Active Landfill and Waste Transfer and Treatment [**APP-308**] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 11.1 – Active Landfill and Waste Transfer and Treatment (Clean) (Version 2) [**REP1-152**]<br><br>6.2 Environmental Statement – Figure 11.1 – Active Landfill and Waste Transfer and Treatment (Tracked) (Version 2) [**REP1-153**] |
| 6.2 Environmental Statement – Figure 13.3 – Population and Human Health Assessment - Properties and Businesses at Risk of Demolition [**APP-319**] | Deadline 1 July 2023 | As identified in Table 3.2 | 6.2 Environmental Statement – Figure 13.3 – Population and Human Health Assessment - Properties and Businesses at Risk of Demolition (Clean) (Version 2) [**REP1-154**]<br><br>6.2 Environmental Statement – Figure 13.3 – Population and Human Health Assessment - |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| | | | Properties and Businesses at Risk of Demolition (Tracked) (Version 2) [REP1-155] |
| 6.2 Environmental Statement - Figure 14.4 - Bedrock Aquifer Designations [APP-325] | Section 51 submission December 2022 | As identified in Table 3.1 | Additional Submission - 6.2 Environmental Statement - Figure 14.4 - Bedrock Aquifer Designations (Version 2) - Accepted at the discretion of the Examining Authority [AS-048] |
| **ES appendices** | | | |
| 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information [APP-335] | Section 51 submission December 2022 | As identified in Table 4.1 | Additional Submission – 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information – (Clean) (Version 2) – Accepted at the discretion of the Examining Authority [AS-049]<br><br>Additional Submission – 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information – (Tracked) (Version 2) – Accepted at the discretion of the Examining Authority [AS-050] |
| 6.3 Environmental Statement – Appendix 2.1 – Construction Supporting Information [APP-335] | Section 51 submission December 2022 | As identified in Table 4.1 | AS-049 and AS-050 as above.<br>Document not re-issued with update included. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 5.3 – Air Quality Construction Phase Results [APP-347] | Deadline 1<br>July 2023 | As identified in Table 4.2 | 6.3 Environmental Statement – Appendix 5.3 – Air Quality Construction Phase Results (Clean) (Version 2) [REP1-161] |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| | | | 6.3 Environmental Statement – Appendix 5.3 – Air Quality Construction Phase Results (Tracked) (Version 2) [**REP1-160**] |
| 6.3 Environmental Statement – Appendix 6.7 – Geophysical Survey Reports (1 of 2) [**APP-360**] | Section 51 submission December 2022 | As identified in Table 4.1 | 6.3 Environmental Statement – Appendix 6.7 – Geophysical Survey Reports (1 of 2) (Version 2) [**AS-051**] |
| 6.3 Environmental Statement – Appendix 6.9 – Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation [**APP-367**] | Section 51 submission December 2022 | As identified in Table 4.1 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement Appendix 6.10 – Assessment Tables [**APP-368**] | Section 51 submission December 2022 | As identified in Table 4.1 | Additional Submission – 6.3 Environmental Statement – Appendix 6.10 – Assessment Tables – (Clean) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-052**]<br><br>Additional Submission – 6.3 Environmental Statement – Appendix 6.10 – Assessment Tables – (Tracked) (Version 2) – Accepted at the discretion of the Examining Authority [**AS-053**] |
| | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 6.13 – Holocene Geoarchaeological Desk-based Assessment of the Route of the Lower Thames Crossing | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| [APP-371] | | | |
| 6.3 Environmental Statement – Appendix 7.7 – Representative Viewpoint and Visual Receptor Baseline Descriptions and Visual Sensitivity [APP-382] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 7.8 – Technical Methodologies [APP-383] | Section 51 submission December 2022 | As identified in Table 4.1 | 6.3 Environmental Statement – Appendix 7.8 – Technical Methodologies – (Clean) (Version 2) – Accepted at the discretion of the Examining Authority [AS-054]<br><br>6.3 Environmental Statement – Appendix 7.8 – Technical Methodologies – (Tracked) (Version 2) – Accepted at the discretion of the Examining Authority [AS-055] |
| 6.3 Environmental Statement – Appendix 7.10 – Schedule of Visual Effects [APP-385] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 7.11 – Traffic and Noise Effects on the Kent Downs AONB [APP-386] | Deadline 1 July 2023 | As identified in Table 4.2 | 6.3 Environmental Statement – Appendix 7.11 – Traffic and Noise Effects on the Kent Downs AONB (Clean) (Version 2) [REP1-162]<br>6.3 Environmental Statement – Appendix 7.11 – Traffic and Noise Effects on the Kent Downs AONB (Tracked) (Version 2) [REP1-163] |
| 6.3 Environmental Statement - Appendix 8.8 – Bats [APP-397] | Deadline 2 3 August 2023 | As identified in Table 4.3 | Document not re-issued. Updates identified in ES Addendum only |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.3 Environmental Statement – Appendix 10.11 – Remediation Options Appraisal and Outline Remediation Strategy [APP-434] | Deadline 1 July 2023 | As identified in Table 4.2 | 6.3 Environmental Statement – Appendix 10.11 – Remediation Options Appraisal and Outline Remediation Strategy (Clean) (Version 2) [REP1-165]<br><br>6.3 Environmental Statement – Appendix 10.11 – Remediation Options Appraisal and Outline Remediation Strategy (Tracked) (Version 2) [REP1-164] |
| 6.3 Environmental Statement – Appendix 11.3 List of Third party Offsite Waste Infrastructure Receptors [APP-437] | Deadline 1 July 2023 | As identified in Table 4.2 | 6.3 Environmental Statement – Appendix 11.3 List of Third party Offsite Waste Infrastructure Receptors (Clean) (Version 2) [REP1-166]<br><br>6.3 Environmental Statement – Appendix 11.3 List of Third party Offsite Waste Infrastructure Receptors (Tracked) (Version 2) [REP1-167] |
| 6.3 Environmental Statement – Appendix 12.4 – Construction Noise and Vibration Assessment [APP-444] | Deadline 1 July 2023 | As identified in Table 4.2 | 6.3 Environmental Statement – Appendix 12.4 – Construction Noise and Vibration Assessment (Clean) (Version 2) [REP1-169]<br><br>6.3 Environmental Statement – Appendix 12.4 – Construction Noise and Vibration Assessment (Tracked) (Version 2) [REP1-168] |
| 6.3 Environmental Statement – Appendix 12.5 – Baseline Noise Survey Information [APP-445] | Section 51 submission December 2022 | As identified in Table 4.1 | Document not re-issued. Updates identified in ES Addendum only |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.3 Environmental Statement – Appendix 14.5 – Hydrogeological Risk Assessment (Part 1 of 2) [APP-458] | Section 51 submission December 2022 | As identified in Table 4.1 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 14.5 – Hydrogeological Risk Assessment (Part 2 of 2) – Annex Q Utilities assessment (groundwater) [APP-459] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment – Part 1 [APP-460] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment – Part 2 [APP-461] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment – Part 3 [APP-462] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment - Part 6 [APP-465] | Deadline 1 July 2023 | As identified in Table 4.2 | 6.3 Environmental Statement – Appendix 14.6 Flood Risk Assessment - Part 6 (Clean) (Version 2) [REP1-171]<br><br>6.3 Environmental Statement – Appendix 14.6 Flood Risk Assessment - Part 6 (Tracked) (Version 2) [REP1-170] |
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment – Part 8 [APP-467] | Deadline 1 July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |

| Application Document name and reference | Date of update | Update description | Updated version of document and reference |
|---|---|---|---|
| 6.3 Environmental Statement – Appendix 14.6 – Flood Risk Assessment – Part 10 [APP-477] | Deadline 1<br>July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| 6.3 Environmental Statement – Appendix 16.2 – Short List of Developments<br>[APP-484] | Deadline 1<br>July 2023 | As identified in Table 4.2 | Document not re-issued. Updates identified in ES Addendum only |
| **Environmental Statement Non-Technical Summary** | | | |
| 6.4 Environmental Statement - Non-Technical Summary (NTS) [APP-486] | Deadline 1<br>July 2023 | As identified in Table 5.2 | Document not re-issued. Updates identified in ES Addendum only |

## 6.2 Summary of new information

6.2.1 Table 6.2 provides a collated summary of new information that has been issued as Appendices to 9.8 Environmental Statement Addendum to provide further information to support the Examination process.

**Table 6.2 Summary of new documents**

| Document name and reference | Date of update | Description |
|---|---|---|
| **Environmental Statement Addendum Appendices** | | |
| Appendix A – Recreational pressure on designated sites | Deadline 1<br>18 July 2023 | As identified in Table 2.2 |
| Appendix B – Cumulative inter-project effects update | Deadline 1<br>18 July 2023 | As identified in Table 2.2 |

| Document name and reference | Date of update | Description |
|---|---|---|
| Appendix C – Review of a single TBM tunnelling methodology | Deadline 2<br>3 August 2023 | As identified in Table 2.3 |
| Appendix D – Appraisal of effects from the two-year rephasing of construction | Deadline 2<br>3 August 2023 | As identified in Table 2.3 |

# References

Planning Inspectorate (2019). Advice Note Seventeen: Cumulative Effects Assessment.

Planning Inspectorate (2023). Lower Thames Crossing Examination Library.

Visit Britain (2022). Annual Survey of Visits to Visitor Attractions.

# Appendices

# Appendix A Recreational Pressure on Designated Sites

## A.1 Introduction

A.1.1 This Appendix has been prepared in response to comments made by Natural England (NE) in relation to nationally designated nature conservation sites. Specifically, NE's Relevant Representation states that *'Natural England does not endorse the direct loss of habitat from the Shorne and Ashenbank Woods Site of Special Scientific Interest resulting from this scheme. We advise that further information is required to understand the potential impacts from recreational users and the nature, scale and effectiveness of the measures proposed for all direct and indirect impacts to the SSSI*'.

A.1.2 This relates directly to comments made within NE's Statement of Common Ground (SoCG) with the Applicant and which have been an area of ongoing discussion between the two parties:

a. Item 2.1.80 of the SoCG with Natural England states that *'a number of new and diverted public rights of way are proposed within the Shorne and Ashenbank Woods SSSI to the south of the A2 which also requires surfaced tracks to be installed. The Environmental Statement has not provided an assessment of the potential for direct and indirect impacts from these proposals to the SSSI resulting from factors such as increased recreational activity and loss of habitat to the surfacing, for example'*.

*b.* Item 2.1.42 of the SoCG with Natural England states that *'Natural England would expect the potential recreation impacts to the SSSI from a car park proposal to be assessed as part of the ES'.*

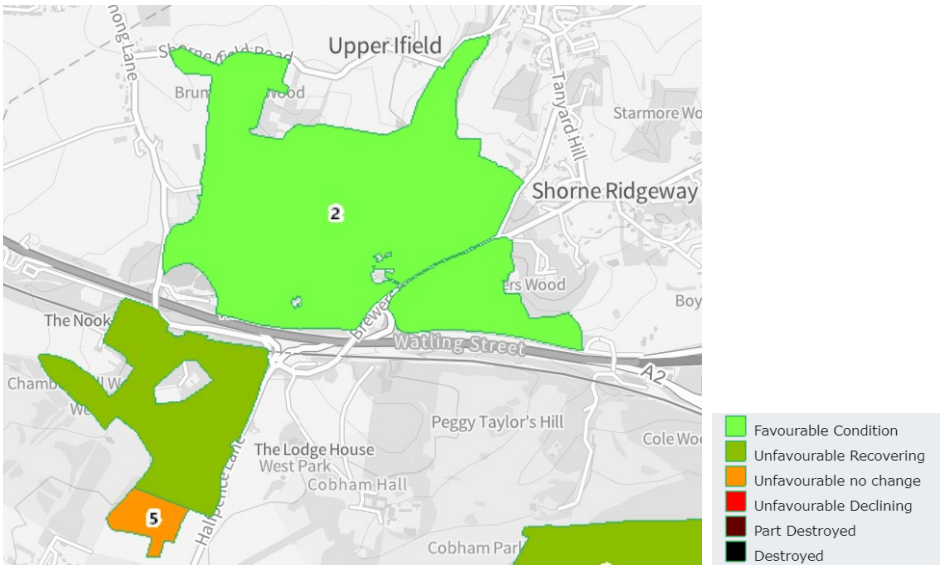
## A.2 Shorne and Ashenbank Woods SSSI

A.2.1 The Shorne and Ashenbank Woods SSSI covers an area of around 185ha, including sections to the north and south of the A2. The reasons for notification of the SSSI are given as *'Shorne and Ashenbank Woods form a complex of ancient and plantation woodland and include a variety of stand-types associated with Tertiary gravels, clays, and sands. The site supports an important and diverse invertebrate fauna, especially its Coleoptera (beetles), Hemiptera (true bugs), and Odonata (dragonflies)*'.

A.2.2 The boundary for the SSSI is shown in Plate A.1, together with current status. The status of each of the three areas shown on the figure has been updated at different times. The figure shows that the areas of the SSSI to the north of the A2 (classified as Randall Wood and Brewers Wood) are in favourable condition (these areas were last surveyed / updated in 2010 according to Natural England data accessed online; prior to this survey, both Randall Wood and Brewers Wood were categorised as 'unfavourable recovering' in 2005). To the south of

the A2, the majority of the SSSI (classified as Ashenbank Wood) has been categorised as 'unfavourable recovering' (last surveyed / updated in 2016, with no change in category since the previous survey undertaken in 2008). A small portion of the designation to the south of the A2 (Ashenbank Wood – south) is categorised as 'unfavourable no change' (the only survey recorded took place in 2008).

**Plate A.1 Site boundary and condition status for Shorne and Ashenbank Woods SSSI**

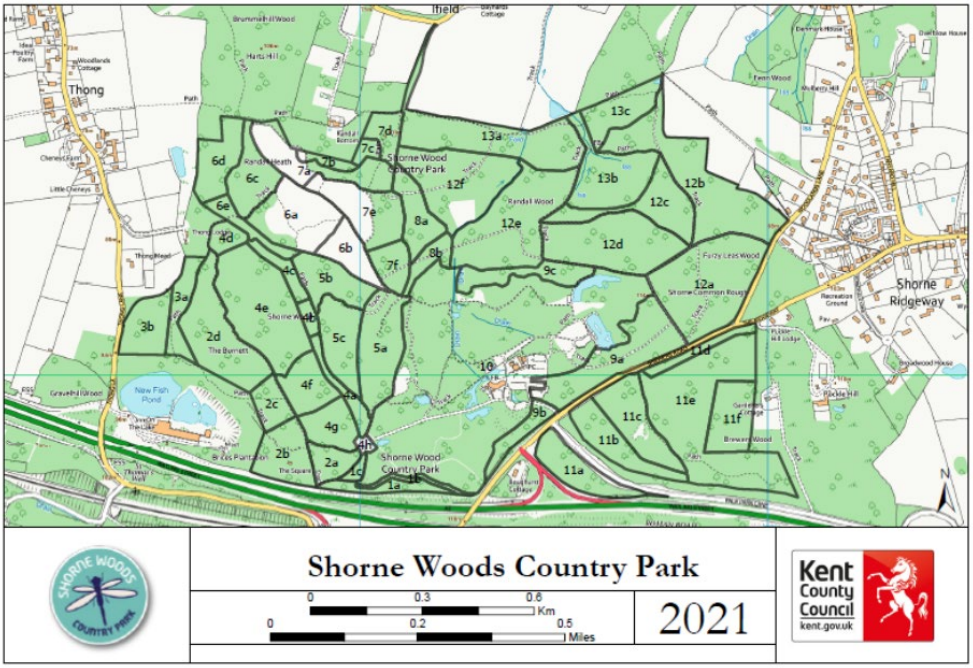



*Source: Magic Map (Natural England, 2023) © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2023.*

A.2.3 Part of the site is owned and managed by Kent County Council as Shorne Woods Country Park (SWCP), with the remainder in the ownership of the Woodland Trust. The SWCP Management Plan 2021-2026 (which was updated in 2022) highlights that the management strategy at SWCP is based on four areas, the first being the requirement to manage the site regarding its designation as a SSSI and the second with regards to the use of the site as a Country Park providing a recreational and education facility.

A.2.4 Management of SWCP is focused on 13 main 'compartments' as shown in Plate A.2, each of which has their own management strategy and objectives.

**Plate A.2 Compartment map of SWCP**




*Source: Shorne Woods Country Park Management Plan 2021-2026, Kent County Council*

A.2.5 Management objectives of SWCP include '*to provide a site on which a variety of activities can be enjoyed within a countryside environment without damaging the ecological interest of the site'*; objectives relating to visitor management include 'to maintain, improve and extend the path network throughout the site via a programme of regular maintenance and upgrade works' (SWCP Management Plan, 2022). The main compartment within which public recreation activities take place is Compartment 10 (shown on Plate A.2 as in the central / southern area of the Country Park). The Management Plan notes that education of, and provision of information for visitors will be a key strategy in resolving any conflict between management objectives.

A.2.6 The remainder of the SSSI is in the ownership of the Woodland Trust and comprises Ashenbank Woods to the south of the A2. Ashenbank Woods has an area of just under 30ha and comprises areas of ancient semi-natural woodland, wood pasture and old parkland areas. Approximately 7ha of the historic parkland is maintained as a series of open glades, managed through cattle grazing and manual cutting programme (Ashenbank Wood Management Plan 2020-2025, Woodland Trust). The long-term policy for Ashenbank Wood as set out in the Management Plan, is for it to *'continue to act as an important heritage, conservation and recreational space in the local landscape'.*

## Existing recreational use

### Shorne Woods Country Park

A.2.7 Recreational use in the SSSI is focused around SWCP to the north of the A2. SWCP is KCC's flagship Country Park. Facilities include a visitor centre and café (opened in 2006), amenity block (opened in 2012) 'changing place' and rain shelter (installed in 2021) and parking for over 300 cars. The café and visitor centre are open 363 days a year. Although there is a requirement to pay for car parking, access to the site itself is free of charge.

A.2.8 The Country Park supports an extensive range of recreational facilities including:

a. A woodland arboretum

b. Trim trail, orienteering courses and geocache locations

c. Signed woodland walks, horse-riding and cycle route

d. Loan of three Tramper mobility vehicles for visitors

e. Picnic sites, adventure play areas and younger children play areas

f. Woodland interpretation, including that installed in Brewers Wood in 2014 as part of a Lottery-funded project.

A.2.9 There are a variety of footpaths and permissive paths in and around the Country Park, these include six waymarked trails of varying lengths and ease of use as well as one statutory public footpath (NS167) which is also a permissive bridleway in sections and follows the northern boundary of the site. Most paths are unsurfaced (with the exception of the 'easy access' trail and sections of the permissive bridleway / cycle path). The 2021 improvements at the site, funded through a European funding programme, included path improvements to improve access from the car park to the easy access trails and for wider walks into the woodlands on surfaced paths.

A.2.10 Two longer distance routes also pass directly through SWCP. These are:

a. the Timeball and Telegraph Trail, which is a long-distance path running from Timeball Tower near Deal in Kent to the Royal Observatory in Greenwich. The route runs in an east–west direction on the southern side of the River Thames, passing directly through Shorne Woods Country Park

b. the Darnley Trail is a 10.5km route which links the Jeskyns Community Woodland with the wider countryside, including to SWCP and Ashenbank Wood.

A.2.11 Horse boxes can use part of the existing car park at SWCP subject to prior bookings or alternatively are required to park at Cyclopark (to the south of the A2) and use the bridleway network that links local sites. The car park is also

available for a small amount of coach parking (up to a maximum of four, with booking required in advance). The car park includes an overflow area; evidence from KCC has highlighted that the car park at SWCP is currently operating at capacity.

A.2.12 No recent (post-Covid) visitor data is available for SWCP. The Management Plan (updated in 2022) provides qualitative information from visitor surveys undertaken in 2004 and 2007 and annual visitor numbers for the period 2010/11 to 2014/15. The latter data has been based on count information from the car park and therefore does not include people who may walk or cycle to the Country Park. The visitor data does not show huge variation across the five year period, ranging between 296,325 visitors in 2012/2013 through to 353,066 visitors in 2013/2014. Visitor numbers to an outdoor attraction such as SWCP are likely to be subject to external factors such as the weather.

A.2.13 The SWCP Management Plan notes that '*due to the popularity of the park during the lockdown, the park was able to access funding for path resurfacing so the existing easy access paths were resurfaced and the muddiest of the paths in the wider woods were surfaced to allow year-round access*'.

A.2.14 The Shorne Woods Country Park Management Plan 2021-2026 refers to previous visitor surveys which suggested that around a fifth of visits to the site were regular visits (i.e. once a week or more) and that the majority of visitors stayed for between one and two hours. Again, the majority of visitors taking part in the surveys said they were local to the area. The 2009 visitor survey suggested that SWCP had a different user demographic to other KCC parks, based on Office for National Statistics (ONS) Approximated Social Grade data (a socio-economics classification which classifies individuals according to employment status). The visitor survey showed that nearly a third of users of SWCP were categorised as social class DE (which corresponds to the lowest social grade, and is defined as including people in semi-skilled and unskilled manual occupations, unemployed people and lowest grade occupations) compared with only 12-13% at other parks; this is likely to be related to the demographic of the local area, with wards along the eastern fringe of Gravesham also exhibiting higher proportions of residents within the DE social grade (for example Riverside, Westcourt and Singlewell wards show 38.2%, 34.2% and 33.4% respectively of residents within the DE social grade, compared to 27.7% for Gravesham overall and 23.2% for Kent)[1]. Car ownership tends to be lower for people in lower social groupings.

[1] (Office for National Statistics, Census 2011 – that at the time of preparing this note, updated data from the 2021 Census was not available in relation to this variable).

### Ashenbank Woods

A.2.15 Ashenbank Woods has six access points for members of the general public. The wood is classified by the Woodland Trust as a 'category A' site, which expects a high level of public access, defined as 15-20 visitors using one entrance every day. The main entrance and car park (which has space for approximately fifteen vehicles) is located at the eastern edge of the wood off Halfpence Lane. There is an established network of both surfaced and unsurfaced pathways in place through the woods, which total around 3.5km. A waymarked trail starts at the car park and provides a walking route of approximately fifty minutes duration. There is also a direct path link to Jeskyns Community Woodland from the south-west of the site. The Darnley Trail passes through part of Ashenbank Woods. The site is also used by local forest schools with regular events held for primary and secondary age children.

A.2.16 The Management Plan for Ashenbank Woods describe the site as 'well-used', with principal groups including local residents, dog walkers, nature enthusiasts and ramblers. Due to the small size of the car park, the majority of visitors access the site from other locations. Some of the constraints highlighted in the Management Plan in relation to recreation use of the Woods include:

a. the high visitor numbers and fairly compact size of the wood mean that it often feels congested, and can become quickly impacted by issues such as dog waste.

b. grazing on site has been problematic due to management of livestock welfare at a busy site with numerous dog walkers, who despite having the option to walk in a cattle free compartment will still choose to walk in close proximity to the cattle.

### The wider area

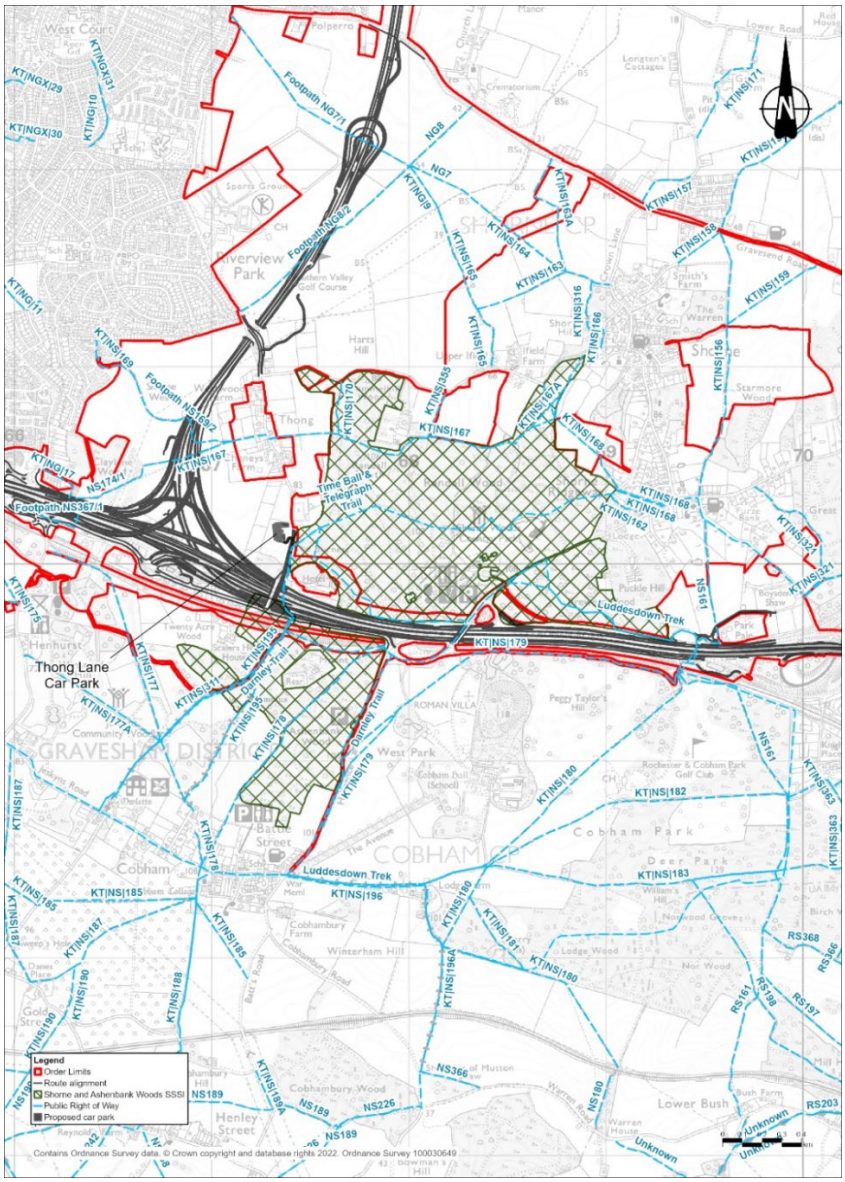
A.2.17 To the west of the Shorne and Ashenbank Woods SSSI is Jeskyns Community Woodland. Jeskyns opened in 2007 and is approximately 149ha in size. The woodland is managed and maintained by Forestry England and includes woodlands, orchards, ponds, play areas and a café. There is a 6km horse trail within the site, together with dog activity areas and trails. Interpretation boards inform visitors of the wildlife, planting, restoration and archaeology of the area. The site is host to a range of user groups and has recently become a focus for the Forest Schools Programme.

A.2.18 There are walking and cycling routes in close proximity, connecting Jeskyns Community Woodland with the wider countryside and to nearby sites such as Shorne Woods Country Park and Ashenbank Woods. There is parking on-site (pay and display) for approximately 200 vehicles (including horse boxes).

A.2.19 Although a relatively new area of community woodland (and consequently parts of the site are quite open), it is already proving to be a popular family destination for informal recreation purposes. The Annual Survey of Visits to Visitor Attractions 2021 records a total of 878,626 visitors to Jeskyns in 2021, making it one of the most visited attractions in the region[2].

A.2.20 Existing walking, cycling and horse-riding routes in and around the Shorne Woods and Ashenbank SSSI are shown in Plate A.3 which is taken from Chapter 13 of the Environmental Statement submitted for the Project.

**Plate A.3 Walking, cycling and horse-riding routes in the vicinity of the Shorne Woods and Ashenbank SSSI**




[2] It should be noted that although country parks are included in the survey findings, they are excluded from the most visited lists on the basis that it is not possible to exclude those who have visited the park in such a way that falls outside the 'visitor attraction' definition (Visitor Attraction Trends in England 2021 Full Report, September 2022)

A.2.21 Prior to the submission of the Development Consent Order application in 2022, user surveys were undertaken in August and September 2019 to establish the level of use of specific PRoWs and minor roads that would be affected by the Project during construction and operation. The survey locations included minor roads and associated footways intersected by the Project, and PRoWs (including footpaths, cycleways, bridleways and byways) either intersected or otherwise affected by the Project. The user surveys comprised a combination of user counts and questionnaire surveys. User survey locations were informed by factors including the observed level of use from a walkover survey in April 2018, consultation with local authorities to establish the importance of particular links/routes, and level of impact as a result of the Project. Routes that were surveyed in the vicinity of the Shorne and Ashenbank Woods SSSI included:

a. Along Thong Lane – three pedestrians and nine cyclists were recorded here on a Sunday in August in 2019

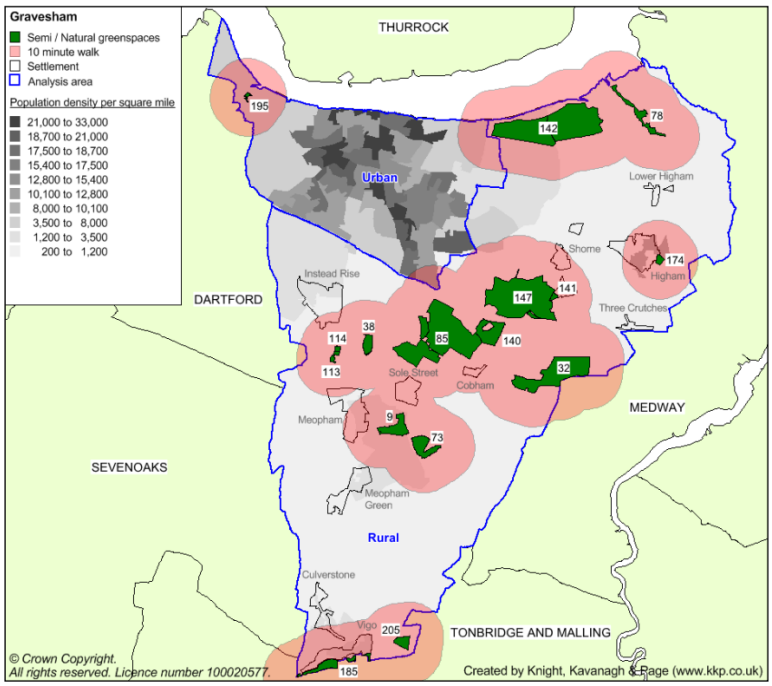
b. Footpath NS174 – the footpath is located to the north of the A2, connecting the National Cycle Network Route 177 to links with Footpath NS167 and passing in a north-east to south-west direction through Claylane Wood. The 2019 survey outlined that there were 40 pedestrian users of the route, along with two cyclists, again on a Sunday during August in 2019.

A.2.22 Usage of the National Cycle Network Route 177 itself has been estimated as high (around 40 users per day), from observation and understanding of nearby route usage.

### Likely catchment area for visitors

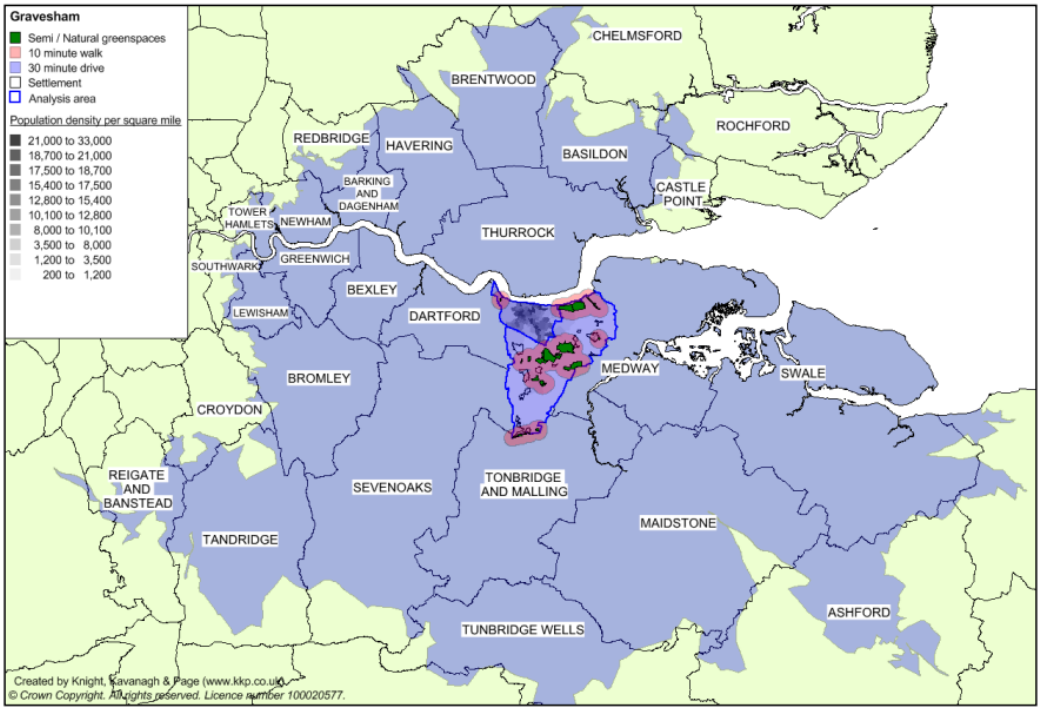
A.2.23 In relation to the likely catchment area for users of Shorne and Ashenbank Woods, this was set out in the Open Space Assessment prepared for Gravesham Borough Council by Knight, Kavanagh and Page in 2016. Guidance on appropriate walking distance and times is published by Fields In Trust (FIT) in its document Beyond the Six Acre Standard (2015); using this guidance, Plate A.4 shows 10-minute walk times to areas of natural and semi-natural space (Shorne Woods Country Park and Ashenbank Woods are shown on the figure as numbers 147 and 140 respectively). The urban areas of Gravesend fall just outside of this catchment for both parts of the site.

## Plate A.4 Natural and semi-natural space within a 10-minute walk time




*Source: Gravesham Borough Council Open Space Assessment Report (Knight, Kavanagh and Page, 2016)*

## Plate A.5 Natural and semi-natural greenspace within a 30-minute drivetime




*Source: Gravesham Borough Council Open Space Assessment Report (Knight, Kavanagh and Page, 2016)*

A.2.24 Plate A.5 then shows an estimated 30-minute drivetime from areas of natural and semi-natural greenspace within Gravesham Borough Council, which includes from SWCP and Ashenbank Woods. The figure shows a very large potential catchment area for the sites.

### Wider visitor trends

A.2.25 Visitor numbers are likely to have changed over the last few years as a result of behavioural changes arising from the Covid-19 pandemic. The People and Nature Survey for England (Natural England, 2021) gathered information on people's experiences and views about the natural environment, and its contributions to health and wellbeing. During April to June 2020, some adults in England were getting outside more often than usual, with 40% of adults reporting that they had spent more time outside since the COVID-19 restrictions began and 31% exercising more in outdoor spaces. The main reasons people gave for visiting natural spaces were for fresh air, physical and mental health, and to connect with wildlife/nature.

A.2.26 Shorne and Ashenbank Woods form part of the northernmost extent of the Kent Downs Area of Outstanding Natural Beauty (AONB). The AONB Management Plan 2021-2026 notes that *''over visiting' has rapidly become an issue across the AONB particularly at countryside with heritage sites. Visitor site car parks are often full by mid-morning on a sunny weekend and the visitor experience at risk of declining, along with erosion to paths, damage to the historic, natural and cultural heritage as well as loss of tranquillity'*. In response, the AONB is seeking to improve facilities that promote off season visiting, encourage sustainable tourism and promote new sites and visitor resources so reducing pressure on honey pot destinations (Kent Downs AONB Management Plan, 2021-2026).

## A.3 Summary of proposals

A.3.1 Natural England has highlighted two aspects of the Project in relation to recreational activity – the creation of a new car park with facilities for horseboxes and a cycle hub proposed at Thong Lane; and the nature of the proposed surfacing for a number of new and diverted public rights of way within the Shorne and Ashenbank Woods SSSI to the south of the A2. Further detail relating to these areas is drawn together in this section.

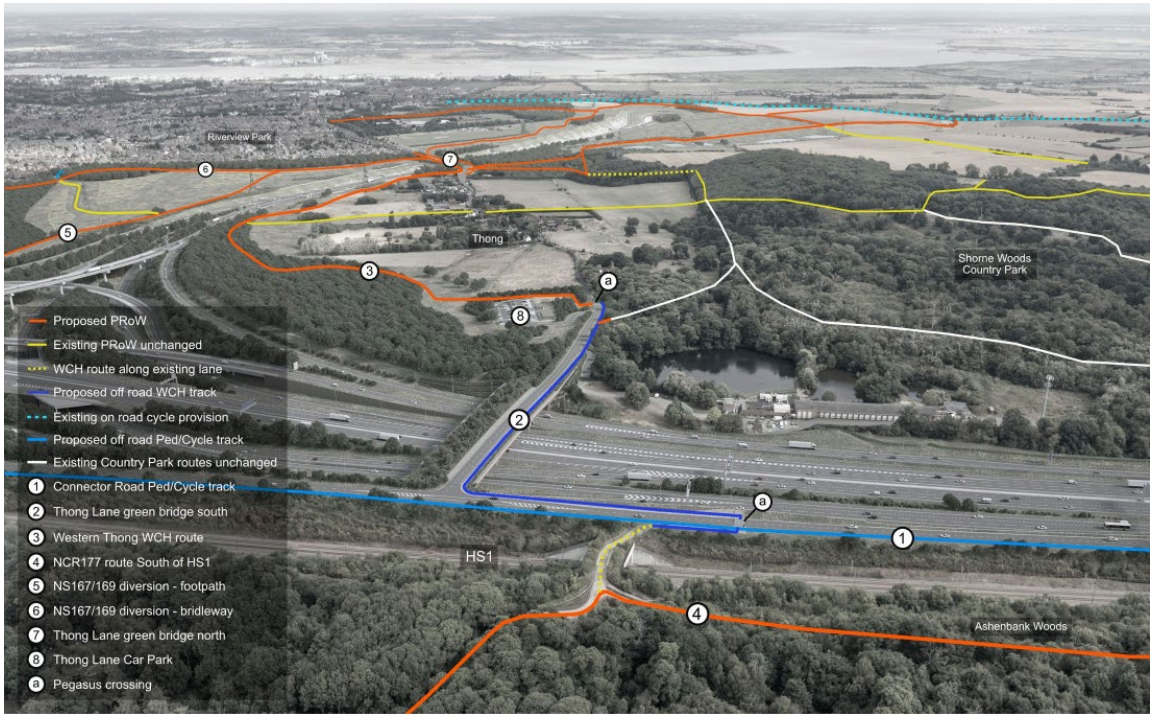
### Thong Lane car park

A.3.2 The car park would re-utilise one of the construction compounds used for the Project and the intention would be for the car park to repurpose hardstanding and utility connections from the construction phase. The Project Design Report Part D: General Design South of the River [**Application Document APP-509**] describes in more detail the proposal for a new car park to the west of Thong Lane, the purpose of which would be to provide recreational access to the

PRoW network and open spaces within the wider area. This commitment is set out in Design Principle S2.11 [**Application Document APP-516**] and adherence to this is secured through Requirement 3 of the draft Development Consent Order.

A.3.3 The design evolution for the car park is described in Project Design Report Part G: Design Evolution [**Application Document APP-514**]. The car park was originally proposed to be located to the east of Thong Lane green bridge north. Following comments received from stakeholders and local residents in response to the Design Refinement Consultation 2020, the proposed car park was moved further south of the village of Thong in order to reduce impacts associated with visitor traffic to the car park through the village of Thong itself. The revised location for the car park, to the south of the village of Thong and to the north of the A2, was presented at the Community Impacts Consultation 2021. The location is illustrated in Plate A.6 (the car park is numbered eight on the figure).

**Plate A.6 Location of proposed Thong Lane car park (shown at number 8)**




*Source: Project Design Report E: Design for Walkers, Cyclists and Horse Riders [**Application Document APP-512**]*

A.3.4 Features of the car park include:

a. Space for approximately 100 vehicles

b. Provision for suitably surfaced parking for 10-12 horseboxes, located away from the main car park circulation

c. A building with provision for a kiosk, toilets, changing and storage facility

d. An area for cycle hire and cycle wash facility.

A.3.5 WCH routes are proposed to connect to and from the car park as far as technically possible (within site constraints). A new bridleway would lead into the proposed car park from the west and a new direct entrance (bridleway) to Shorne Woods Country Park would be provided via a Pegasus crossing on Thong Lane. These links are shown in Plate A.7.

A.3.6 The new car park would be owned and managed by KCC and run on the same basis as the existing Country Park car park (i.e. pay and display). KCC have noted that the current car parks within SWCP are at capacity and that an additional car park located at Thong Lane would be particularly beneficial for basing cyclists and equestrian visitors. The outline design of the new car park has been developed in close consultation with KCC; the detailed design of the car park would be developed post-Development Consent Order (DCO) grant in accordance with Schedule 2 Requirement 3 (Detailed Design) and Requirement 5 (Landscaping and Ecology) [**Additional Submission AS-038**]. Further information relating to design of the car park is set out in Design Principle S2.11 [**Application Document APP-516**].

## Walking, cycling and horse riding proposals

A.3.7 New public rights of way proposed in the vicinity of the Shorne and Ashenbank Woods SSSI are shown on Plate A.7. Proposed PRoWs are shown in orange, with proposed off-road WCH tracks in dark blue and proposed off-road pedestrian / cycle tracks shown in light blue. All existing PRoW are shown in yellow, with existing permissive routes within the Country Park shown in white. The proposed car park at Thong Lane is shown at numbered point five in the figure.

**Plate A.7 Preliminary design: WCH routes in the M2/A2/A122 Lower Thames Crossing Junction area**


*Source: Project Design Report E: Part E Design for Walkers, Cyclists and Horse Riders [**Application Document APP-512**]*

A.3.8 Plate A.7 shows a new east-west route passing through Ashenbank Woods and on to Jeskyns Community Woodland. This is the route for the diversion of NCR177, where existing tracks shall be temporarily resurfaced appropriately for road cycle use (as set out in Design Principle S1.05 [**Application Document APP-516**]). The nature of new sections is described in the Project Design Report Part E: Design for Walkers, Cyclists and Horse Riders [**Application Document APP-512**] as follows:

a. To the west of the Halfpence Lane roundabout the existing track along the northern edge of Ashenbank Woods will have its surface made suitable for cyclists through to the connection with the southern side of the existing green bridge over HS1. This section through Woodland Trust land is part of the Darnley Trail and includes permissive use for walkers, cyclists and horse riders, the designation of this track will remain unchanged. Once the new roadside alignment of NCR177 is available improvements to the surface will be removed at the request of the landowner. Article 35 of the draft DCO [**Additional Submission AS-038**] relates to the temporary use of land for carrying out the authorised development.

b. NCR177 remains south of HS1 with a length of the surface of byways NS195 and NS311 permanently improved to bring the route south of Chambers Hill Wood and into Jeskyns Community Woodland. Due to the increased cycle traffic for the duration of the works, access for motor vehicles will be prohibited on these byways. Following the opening of the alternative roadside route, restrictions will be lifted.

c. There is an existing network of routes through Jeskyns Community Woodland with a variety of permitted users and surface types, including a dedicated horse-riding trail close to the northern boundary, this connects NS311 to the western part of the site. An existing unmade track from NS311 through the eastern part of the site will be surfaced and made available to pedestrians and cyclists as a permissive track, horse riders will continue to use the existing horse-riding trail. The new pedestrian-cycle track will terminate at footpath NS177, a small part of this will be made available to cyclists. There is an existing pedestrian track linking NS177 to the site car park, cyclists will be given permissive use of this track. The existing horse-riding trail crosses this track east of the car park. The section of this track west of this point will also permit equestrian use and will connect this horse-riding trail with Henhurst Road close to the junction with Church Road. The proximity of this route to the car park and cafe offers both an opportunity for recreational cyclists to join NCR177 at Jeskyns Community Woodland and for NCR177 users travelling through Jeskyns to purchase refreshments.

A.3.9 The surface through Ashenbank Wood and Jeskyns Community Woodland shall be removed once the permanent route is complete if required by the landowners, and the quality of the existing track shall be restored.

## Design and surfacing of WCH routes

A.3.10 The Preliminary Design recognises the existing and potential use, in addition to the existing landscape character, of WCH routes and promotes a sympathetic approach rather than the application of a standard approach that may not be appropriate.

A.3.11 Specific information relating to types of surface will be provided at detailed design stage. At Preliminary Design stage, a number of design principles have been developed which are of relevance to WCH routes in the vicinity of Shorne and Ashenbank Woods SSSI (Design Principles [**Application Document APP-516**]).

A.3.12 General design principles for WCH routes are detailed in Table 4.1 of the Design Principles [**Application Document APP-516**], with principles of specific relevance including PEO.03 and PEO.04. Principle PEO.03 relates to detailed design, stating that *'surfacing, signage, boundary treatments and access controls shall be designed with the intent of being efficient and integrated,*

*appropriate to the type of usage permitted and appropriate to its surrounding context as much as is reasonably practicable*'. Principle PEO.04 goes on to state that:

a. WCH routes shall be designed in accordance with the following standards:

   i. DMRB standard CD 143 Designing for walking, cycling and horse-riding (Highways England, 2021a)

   ii. DMRB standard CD 195 Designing for cycle traffic (Highways England, 2021b)

   iii. Local Transport Note 1/20 Cycle infrastructure design (Department for Transport, 2020)

b. In addition to the above, WCH routes should consider the following guidance (up to the DCO submission date):

   i. Local Cycling and Walking Infrastructure Plans - Technical Guidance for Local Authorities (Department for Transport, 2017)

   ii. Sustrans Design Manual – Handbook for cycle-friendly design (2014) and

   iii. British Horse Society advice notes.

A.3.13 In all type of location both the landscape context and the types of user will be paramount in defining the types of surfaces to be used at detailed design stage. This is secured in the Project Design Principles [**Application Document APP-516**].

A.3.14 Paragraph 3.4.14 of the Project Design Report Part E: Design for Walkers, Cyclists and Horse Riders [**Application Document** ]] states tha*t 'in order to maintain the rural character of the area west of Thong, and when considering that recreation usage is anticipated to be higher than commuter usage, it is important that surface finishes appropriate to context and meeting the requirements of expected users are considered during detailed design.*'

## A.4 Assessment of impacts to the Shorne and Ashenbank Woods SSSI

A.4.1 This section provides an assessment of the likely impacts associated with creation of a new car park at Thong Lane for recreational users, and creation of new, temporary WCH routes to the south of the A2, on the Shorne and Ashenbank Woods SSSI.

## Visitor impacts associated with Thong Lane car park

A.4.2 Direct and indirect pathways for recreational impacts arising from the creation of a new car park at Thong Lane are as follows:

a. Direct pathways relate to a change in visitor numbers, associated effects relating to physical damage (e.g. soil compaction or erosion) and visual impact.

b. Indirect pathways relate to wider aspects that may arise as a result of increased recreational users, for example littering, disturbance of wildlife, impacts arising from the presence of dog faeces, effects on livestock (Ashenbank Woods), changes in air pollution as a result of the introduction of additional vehicles, visitor perceptions of the area.

### Direct impacts

A.4.3 The new car park would have space for approximately 100 vehicles. A number of assumptions have been made around usage in order to calculate the likely change in visitor numbers arising from the new car park, as follows:

a. The car park is assumed to be open 363 days of the year (this is in line with the main car park within SWCP).

b. Two occupancy scenarios have been tested – these include a lower occupancy rate of 50% (i.e. for each day the car park is open, half the spaces are utilised once) and an upper occupancy rate of 80% (i.e. for each day the car park is open, 80% of the spaces are utilised once)[3]. It is noted that there will be periods during the year where occupancy rates are likely to be higher / lower (for example during the summer months there may be multiple use of individual spaces and in the winter months the occupancy rate may be far below 50%); an annual occupancy rate has been applied to allow for changes in use profile.

c. Each vehicle is assumed to contain an average of two people. This is aligned with data from previous visitor surveys at SWCP.

A.4.4 Based on the above assumptions, the car park at Thong Lane is likely to generate usage as follows:

a. Scenario 1 (50% occupancy rate) generates 18,150 vehicles per annum (100 spaces multiplied by 363 days, multiplied by 0.5 occupancy rate). Based on two people per car, this equates to around **36,300** visitors per annum

[3] Occupancy rates for car parking spaces typically vary between 50% and 80% (The size and shape of the UK parking profession, British Parking Association, 2013). It is noted that these figures relate to urban car parks and that rural car parks may experience greater extremes at certain points in the year.

b. Scenario 2 (80% occupancy rate) generates 29,040 vehicles per annum (100 spaces multiplied by 363 days, multiplied by 0.8). Again, based on two people per car, this equates to around **58,080** visitors per annum.

A.4.5 In the context of overall visitor numbers to SWCP (using the highest most recent annual count of 353,066 visitors in 2013/14), this equates to a 10.3% overall increase in visitor numbers (Scenario 1) and a 16.45% increase in visitor numbers (Scenario 2).

A.4.6 Whilst a proportion of these visitors will be additional to the area, the majority are likely to be 'displaced' visitors from other locations, i.e. existing visitors to the area who have simply chosen the Thong Lane car park over destinations such as the main SWCP car park or Jeskyns Community Woodland car park for reasons of **convenience** (it may be closer to their home), **purpose** (the opportunity for connecting to wider bridleway or cycling routes) or **capacity** (for example the main SWCP car park is too busy and the Thong Lane car park presents a reasonable alternative).

A.4.7 Visitors arriving at the car park would have a choice as to route and destination, meaning that numbers would be dispersed across the area rather than concentrated in any one location. Visitors would most likely choose between the following direction and destinations:

a. Access SWCP to the east using the new Pegasus crossing over Thong Lane. This presents access to permissive paths within the western portions of the Country Park.

b. Access north towards Thong either along Thong Lane or as part of the Thong western loop, a new PRoW created as a result of the Project which provides traffic-free access ultimately to the eastern fringe of Gravesend (Riverview).

c. Access south across the Thong Lane green bridge and A2 towards Ashenbank Woods and Jeskyns Community Woodland.

A.4.8 It is also noted that the estimated increase in visitor numbers only relates to those who would be accessing the area via the new car park and does not include people who may walk or cycle to Shorne and Ashenbank Woods from nearby residential areas.

A.4.9 A final factor to take into consideration is the provision of a new recreational landscape (Chalk Park) to the south of the River Thames which may attract visitors and divert them from regular use of existing areas such as SWCP, Ashenbank Woods and Jeskyns Community Woodland. The Chalk Park public open space provision is described in Design Principle S3.04 [**Application Document APP-516**]. Chalk Park is located to the north-east of Gravesend, currently an area of limited public open space provision; residents of the eastern

fringes of Gravesend would be able to walk / cycle to Chalk Park rather than necessarily travelling by car to access Shorne Woods Country Park.

A.4.10 The visitor context within the wider area has been referred to earlier. Jeskyns Community Woodland to the south of the A2 is a well-visited destination, with 878,626 visitors recorded in 2021 (Visit Britain, 2022). This, combined with approximately 400,000 visitors to SWCP per annum, shows that the area is already a highly visited leisure destination. An increase of 36-58,000 visitors via the proposed Thong Lane car park is therefore not considered to have a significant additional effect in the wider context of the local visitor environment, particularly as the visitors using the car park are likely to be dispersed across a wide area.

A.4.11 In relation to physical damage potentially caused by the increase in visitors:

a. The SSSI to the north of the A2, which is likely to be the principal destination for users of the car park (from a distance and convenience perspective) is in good condition and no recreational impact issues have been identified within the Shorne Woods Management Plan for compartments along the western edge of the Country Park

b. Cycling routes within Shorne Woods Country Park are appropriate for this use and clearly waymarked

c. New cycling routes proposed to the west of the new car park (Thong western loop) would be designed in accordance with the design principles secured in the DCO and therefore be of appropriate surfacing for their use

d. The car park is being constructed on the site of a former construction compound. Following demobilisation of the construction compound, the car park and associated walking, cycling and horse riding routes would be completed. Both the car park and part the alignment of the western loop overlap with the need for the construction compound and therefore could not be complete until the compound is removed or part demobilised. Both the car park and the WCH routes would therefore be completed in the same period of time, thereby avoiding people potentially using routes that are not appropriately designed.

e. The proposed diversion of the national cycle route NCR177 through Ashenbank Woods and Jeskyns Community Woodland will no longer be required at the time the proposed car park is constructed (as the car park is due to be created on the site of the former construction compound and therefore at the completion of the construction phase in this area); the temporary surfacing through Ashenbank Wood will be removed once the permanent cycle route has been completed, and the quality of the existing track though the Woods restored. It is noted that the proposed route

through Ashenbank Woods is part of the Darnley Trail and currently includes permissive use for walkers, cyclists and horse riders. The designation of this track will remain unchanged during both construction and operation phases. It is possible that leisure use of this trail may increase as a result of users becoming accustomed to, or aware of, the trail from the construction phase. However, the connections towards Jeskyns may be more attractive to users from the car park (i.e. heading towards a known destination with potential for linking in to a longer leisure route and additional facilities).

A.4.12 In terms of addressing visual impact, Design Principle S2.11 [**Application Document APP-516**] contains provision for a wooded buffer along Thong Lane, planting to the north of the car park which would be designed to screen views from the village of Thong and boundary planting designed to integrate the car park into the surrounding landscape. Schedule 2 Requirement 3 (Detailed Design) and Requirement 5 (Landscaping and Ecology) of the draft DCO [**Additional Submission AS-038**] make further provision for the detailed design of the car park.

### Indirect impacts

A.4.13 Indirect pathways relate to wider aspects that may arise as a result of increased recreational users. No significant indirect pathways have been identified:

a. Indirect effects potentially caused by a rise in visitor numbers may relate to littering and visitor behaviour associated with dog walking (not picking up dog faeces). These are considered to be able to be dealt with through visitor information and awareness raising campaigns which form part of the management of the existing Country Park to the north of the A2 and of the Woodland Trust's approach to managing Ashenbank Woods to the south of the A2.

b. The impacts of existing visitors (primarily dogwalkers) on livestock within Ashenbank Woods has already been identified as part of the Woodland Trust Management Plan for the site. Of the potential user groups for the new car park, dogwalkers are likely to stay for the shortest duration and typically walk short, circular routes; as such this group is unlikely to venture into Ashenbank Woods in sufficient numbers to create an additional effect, as a result of the distance from the new car park.

c. No air pollution effects are likely to be experienced as a result of the introduction of additional vehicles to the car park, as a result of the existing context of the local area (the busy A2 immediately to the south of the car park) and the number of vehicles likely to utilise the car park.

## Visitor impacts associated with new WCH routes to the south of the A2

A.4.14 The new WCH routes to the south of the A2 relate to the creation of a temporary diversion route for NCR177 as set out in Section 1.3. As with the new car park, both direct and indirect pathways for recreational impacts arising from the creation of the new WCH routes have been identified:

a. Direct pathways resulting from a change in visitor numbers and associated effects relating to physical damage (e.g. soil compaction from bike tyres).

b. Indirect pathways may relate to aspects of visitor behaviour such as littering or disturbance of wildlife.

### Direct impacts

A.4.15 Data from WCH surveys undertaken in 2019 showed approximately 100 cyclists in the vicinity of the Brewers Road / Halfpence Lane / A2 slip lane area over the course of a weekday 12-hour period. This aligns with the likely use of the cycle infrastructure in this location as commuter-focused. During the construction phase of the Project, a diversion for the NCR177 has been proposed, with the creation of a section of route through Ashenbank Woods and on to Jeskyns Community Woodland, before rejoining the current alignment of the cycleway further to the west. Although both the temporary and permanent diversions to NCR 177 involve increased travel distances, these are not considered to be significant in terms of affecting their level of use by cyclists in terms of the overall distances typically travelled by cyclists using the route; both the temporary and permanent diversion routes allow for improved user experience.

A.4.16 It is assumed therefore that a worst-case use level for NCR 177 through the section of Ashenbank Woods could therefore be in the order of 100 cyclists per day; usage may be concentrated in morning and evening commute periods and is therefore unlikely to conflict with other leisure users of the trail. As noted previously, an appropriate temporary surfacing would be created on the section of the route through Ashenbank Wood, which would be removed on completion of the works at the request of the Woodland Trust (as set out in Article 35 of the draft DCO [**Additional Submission AS-038**] which relates to the temporary use of land for carrying out the authorised development).

A.4.17 Leisure use of the temporary cycle route through Ashenbank Woods is not considered to be significantly different from that currently experienced (as the route is already a permissive walking, cycling and horse-riding route as part of the Darnley Trail). There may be a minor increase in user numbers due to increased awareness once the new temporary surface is completed.

### Indirect impacts

A.4.18 Indirect impacts potentially caused by a rise in user numbers may relate to littering; issues of this nature are considered to be able to be dealt with through visitor information and awareness raising campaigns which form part of the Woodland Trust's existing approach to managing Ashenbank Woods.

## A.5 Summary

A.5.1 In summary, no significant effects on the Shorne and Ashenbank Woods SSSI are considered likely to arise either as a result of the creation of the new car park at Thong Lane or as a result of new WCH routes to the south of the A2. The principal reasoning behind these conclusions are as follows:

a. The number of net additional visitors to the area as a result of the new car park are considered to be very small. Visitors are primarily likely to be displaced from other nearby locations (such as the main Shorne Woods Country Park car park or Jeskyns Community Woodland car park) rather than new visitors to the area entirely.

b. Route choice from the car park ensures that the small number of visitors are further dispersed throughout the area rather than concentrated in one direction. Access into the western portion of SWCP is likely to be the principal direction for visitors; the SSSI in this location is in good condition with no current issues associated with recreational usage or pressure identified in the SWCP Management Plan.

c. Potential indirect effects associated with visitor behaviour (e.g. littering or not picking up dog faeces) are considered to be able to be effectively managed through existing management processes and procedures (for example visitor information boards).

d. Temporary impacts associated with the use of the diverted cycle route through Ashenbank Woods during the construction phase are not considered to be significant. An appropriate surfacing will be created for the duration of the use, which will be removed upon completion of the works.

# Appendix B Cumulative inter-project effects update

## B.1 Introduction

B.1.1 The assessment of cumulative inter-project effects is presented in Environmental Statement Chapter 16: Cumulative Effects Assessment [APP-154].

B.1.2 As set out within Section 16.3 of Environmental Statement Chapter 16, the inter-project effects assessment used a 'cut-off date', after which no further online planning application searches were included in the long-and shortlists. This was to allow sufficient time for the subsequent assessment work to be completed to a fixed date, prior to submission of the DCO application. The inter-project effects assessment and its associated conclusions are therefore based on searches of the numerous local authority websites undertaken up to 31 May 2022.

B.1.3 In line with the approach in Planning Inspectorate (2019) Advice Note Seventeen (Cumulative effects assessment relevant to nationally significant infrastructure projects) further searches have been undertaken since the cut-off date to identify new developments that have come forward and relevant new information on developments previously considered in the Environmental Statement. These searches followed the same methodology as set out in Section 16.3 of Environmental Statement Chapter 16. This resulted in an updated shortlist of other developments requiring assessment or re-assessment of the potential for inter-project effects in combination with the Project.

B.1.4 This Appendix summarises the results of the updated inter-project effects assessment; with particular focus on where significant effects have been identified that are in addition to those currently presented in Environmental Statement Chapter 16 as submitted for the DCO application.

## B.2 Signposting to the DCO application

B.2.1 This appendix and the associated assessment work that has been undertaken since the submission of the DCO application, provides an update to the environmental information presented in the following Application Documents:

a. 6.1 Environmental Statement - Chapter 16 - Cumulative Effects Assessment [APP-154]

b. 6.2 Environmental Statement - Figure 16.2 - Developments in the Cumulative Shortlist [APP-330]

c. 6.3 Environmental Statement - Appendix 16.1 - Long List of Developments [APP-483]

d. 6.3 Environmental Statement - Appendix 16.2 - Short List of Developments [APP-484]

B.2.2 It is not intended that the documents listed a. to d. above will be updated or reissued to incorporate the further assessment work that has been undertaken in 2023. This appendix instead presents a record of the material updates to the conclusions of the above Application Documents that have been identified, for transparency and understanding during Examination.

## B.3 Inter-project effects assessment update

B.3.1 An update to the inter-project cumulative effects assessment was undertaken in April 2023 in line with the methodology set out within Section 16.3 of Environmental Statement Chapter 16: Cumulative Effects Assessment [APP-154]. This included first updating the long list of developments (as presented in Environmental Statement Appendix 16.1: Long List of Developments [APP-483]) to be considered as part of the April 2023 update. These were then shortlisted to take forward any identified new developments requiring assessment or previously assessed developments that have notably changed and require a review and update of the previous assessment. This shortlisting process included developments in the long list that had previously been scoped out of the shortlist, but where the information available within local authority planning portals has since been updated and is considered notable and relevant, such developments have now been shortlisted. Where development changes were minor (for example a non-material amendment to the proposals) and based on professional judgement considered unlikely to result in a significant change to the original assessment conclusions, these were not shortlisted for reassessment.

B.3.2 The April 2023 inter-project effects assessment update relates to further online searches covering the period between 31 May 2022 and end of February 2023. Based on the data available at the time of undertaking this inter-project effects assessment update, the following were identified:

a. New information in relation to 21 developments previously assessed and presented in the Environmental Statement Chapter 16.

b. 55 new developments shortlisted for assessment in the April 2023 update.

### Summary of inter-project effects assessment update conclusions

B.3.3 Table B.1 below provides a summary of any changes to significant effects for each environmental topic, as identified in the inter-project cumulative effects assessment of the updated shortlist.

**Table B.1 Significant inter-project effects arising from additional or updated developments**

| Topic | Potential for new or different significant effects |
|---|---|
| Air quality | No change to significance of air quality effects during construction or operation from the updated inter-project effects assessment. |
| Cultural heritage | Two additional shortlisted developments were identified with the potential to result in **significant** adverse inter-project effects for cultural heritage receptors during construction. One of these developments was also identified with the potential to result in an additional **significant** adverse inter-project effects for cultural heritage receptors, during operation, which was not identified in the ES at DCO submission. |
| Landscape and visual | Three additional shortlisted developments were identified with the potential to result in additional **significant** adverse inter-project effects for landscape and visual receptors, during construction, which were not identified in the ES at DCO submission. No change to significance of landscape and visual effects during operation |
| Terrestrial biodiversity | No change to significance of terrestrial biodiversity effects during construction or operation from the updated inter-project effects assessment. |
| Marine biodiversity | No change to significance of marine biodiversity effects during construction or operation from the updated inter-project effects assessment. |
| Geology and soils | Nine additional shortlisted developments were identified with the potential to contribute to **significant** adverse inter-project effects on soils during construction, due to the potential for permanent loss of best and most versatile (BMV) land. |
| Material assets and waste | The additional 55 shortlisted developments were identified with the potential to contribute to **significant** adverse inter-project effects on regional landfill capacity during the construction of the Project. |
| Noise and vibration | No change to significance of noise and vibration effects during construction or operation from the updated inter-project effects assessment. |
| Population and human health | One updated development was identified as having the potential to now result in moderate and **significant** beneficial (previously considered to be negligible) inter-project effects on population and human health receptors during operation, in relation to employment opportunities. |
| Road drainage and the water environment | No change to significance of road drainage and the water environment effects during construction or operation from the updated inter-project effects assessment. |
| Climate | No change to significance of climate effects during construction or operation from the updated inter-project effects assessment. |

B.3.4 Table B.2 provides further detail on the nature of the significant effects identified and the developments to which these inter-project effects relate. Table B.2 also sets out the resulting changes to the conclusions presented in ES Chapter 16 Table 16.12.

## Table B.2 New significant inter-project effects since DCO submission

| Topic | Development and effect | Update to significance reported in ES Chapter 16 Table 16.12 |
|---|---|---|
| Cultural heritage | One development (Thurrock Hydrogen Plant, Thurrock Council Planning Application Reference: 22/00812/SCR) was assessed to have the potential for moderate adverse and **significant** inter-project effects during both construction and operation on the setting of Tilbury Fort scheduled monument, West Tilbury Conservation Area, East Tilbury Conservation Area, listed buildings located within and near the conservation areas. | No change to conclusion of moderate adverse significant effects on the identified heritage assets during construction and operation.<br>Key aspects of setting of the heritage assets are not affected by the potential development such as views across the Thames for Tilbury Fort and key associations with nearby defensive structures. |
| Cultural heritage | One development (East Havering Datacentre and Ecology Park, London Borough of Havering Planning Application Reference number not available) was assessed to have the potential for moderate adverse and **significant** inter-project effects on archaeology during construction and historic landscapes adjacent to the Project during construction and operation. | No change to conclusion of moderate adverse significant effects on archaeology and historic landscapes during construction.<br>Potential for **significant** moderate adverse inter-project effects on historic landscapes in the vicinity of the proposed development during operation, that were not identified in the ES at DCO submission. |
| Landscape and visual | One new development (Land Adjacent Blackshots Stadium and Stanford Road Grays, Thurrock Council Planning Application Reference: 21/01309/FUL) was assessed to have the potential for moderate adverse and **significant** inter-project effects on local landscape character and visual amenity effects on receptors within the ZoI including residential properties at the edge of Grays, Treetops School and Thurrock Rugby Club during the construction of the Project. | Potential for additional **significant** moderate adverse inter-project effects on local landscape character and visual amenity effects on receptors during construction. |
| Landscape and visual | One new developments (East Havering Datacentre and Ecology Park, London Borough of Havering Planning Application Reference number not available) was assessed to have the potential for moderate adverse and **significant** inter-project effects on local landscape character and visual amenity effects on receptors within the ZoI including residential properties east of | Potential for additional **significant** moderate adverse inter-project effects on local landscape character and visual amenity effects on receptors during construction. |

| Topic | Development and effect | Update to significance reported in ES Chapter 16 Table 16.12 |
|---|---|---|
| | Ockendon Road/Clay Tye Road, isolated residential properties along Fen Lane, the local PRoW network, Fen Lane and Top Meadow Golf Club during the construction of the Project. | |
| Landscape and visual | One development (Land off Muckingford Road, Linford, Thurrock Council Planning Application Reference: 16/01232/OUT) was assessed to have the potential for large adverse and **significant** inter-project effects on landscape and visual receptors within the ZoI including residential properties along the edge of East Tilbury and Linford, isolated residential properties along Station Road and Love Lane, the local PRoW network, Muckingford Road and the Tilbury Loop railway line during the construction of the Project. | Potential for additional **significant** large adverse inter-project effects on local landscape character and visual amenity effects on receptors during construction. |
| Geology and soils | Nine new developments included in the updated shortlist were assessed to result in very large adverse and **significant** inter-project effects on soils within the ZoI during construction, due to the potential for permanent loss of best and most versatile (BMV) land during construction. These additional developments are as follows:<br>• Brentwood Borough Council Local Plan Allocation R06: Land off Nags Head Lane, Brentwood<br>• Thurrock Council 22/00812/SCR: Thurrock Hydrogen Plant<br>• Thurrock Council 21/01309/FUL: Land Adjacent Blackshots Stadium and Stanford Road, Grays<br>• Thurrock Council 23/00188/FUL: Land South of Mollands Lane, South Ockendon<br>• Brentwood Borough Council 22/01243/OUT: Land to South of Childerditch Industrial Estate<br>• Brentwood Borough Council 22/01205/FUL: Cheale Meats Ltd Orchard Farm<br>• London Borough of Havering P1724.21: Land to the East of Warley Substation<br>• Thurrock Council 16/01232/OUT: Land off Muckingford Road, Linford | No change to conclusion of very large adverse inter-project effects due to permanent reduction in the size of the BMV agricultural land resource as a result of construction of the Project and other developments. |

| Topic | Development and effect | Update to significance reported in ES Chapter 16 Table 16.12 |
|---|---|---|
| | • East Havering Datacentre and Ecology Park | |
| Material assets and waste | The additional 55 new developments included in the updated shortlist were assessed to result in moderate adverse and **significant** inter-project effects on regional landfill capacity during the construction of the Project. | No change to conclusion of moderate adverse inter-project effects due to the scale of the anticipated permanent reduction in existing regional landfill capacity. |
| Population and human health | One development (Land South of East Horndon Hall Tilbury Road West Horndon development. Brentwood Borough Council Planning Application Reference: 19/00315/OUT) was assessed to have the potential for moderate beneficial and **significant** inter-project on population and human health receptors during operation, in relation to employment opportunities. | No change to overall conclusion of moderate beneficial inter-project effects in relation to employment creation. |

## References

Planning Inspectorate (2019). Advice Note Seventeen: cumulative effects assessment relevant to nationally significant infrastructure projects. Accessed May 2023. https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advicenotes/advice-note-17

# Appendix C Review of a single TBM tunnelling methodology

## C.1 Introduction

C.1.1 This Appendix has been prepared to provide clarification on the flexibility within the construction methodology regarding the use of tunnel boring machinery (TBM). It provides a review of any potential associated changes to construction effects reported in Application Documents 6.1 to 6.4 Environmental Statement [**APP-138** to [**APP-486**] submitted as part of the Development Consent Order (DCO) application for the A122 Lower Thames Crossing (the Project) in October 2022.

C.1.2 This Appendix has been prepared in response to the action identified by the Examining Authority at Issue Specific Hearing 1 (ISH1) on 21 June 2023. The agenda for the hearing [**EV-014**] included item 4c)ii '*What is the effect on construction duration and environmental effects of the proposed use of a single tunnel boring machine (TBM)?*'. This issue was discussed during the hearing as documented in the Transcript [**EV-023**] and in 9.10 Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**]. It was agreed during ISH1 that further information would be provided in writing. The Action Points from ISH1 - 21 June 2023 [**EV-023a**] identified Action Point 2 as follows:

*"The Applicant is requested to provide a tabulated addendum to the ES, reviewing the construction effects changes consequent on the possible effect of changing from the use of 2 tunnel boring machines (TBMs) to 1 TBM. The duration of works and the effects experienced by receptors should be expressly considered. Effects and conclusion changes (if any) should be tabulated for each component of the Environmental Statement (ES) analysis. This request imports no judgement by the ExA on the question of whether this amounts to a change to the project as applied for. It is made in the interests of ensuring that any possible implications for the ES and the project Rochdale Envelope are identified."*

## C.2 Background

C.2.1 The DCO application set out an environmental assessment based on a scenario where two TBMs would be used. This Appendix takes account of the flexibility within the tunnelling methodology and the assessments submitted as part of the DCO application, which enables the use of a single TBM if appropriate.

C.2.2 The Appendix outlines out how the works would be undertaken if a single TBM were to be used; starting and finishing at the North Portal, rather than two TBMs

both starting at the North Portal and ending at the South Portal, as presented in 6.1 Environmental Statement - Chapter 2 - Project Description [**APP-140**]. It subsequently reviews and demonstrates that the construction effects and conclusions reported within the ES are correct and applicable to both the single and two TBM scenarios.

C.2.3 Using a single TBM could deliver several efficiencies, particularly in terms of significant cost savings and a reduction in material use. In comparison with the two TBM approach, using a single TBM would result in a saving of approximately 38,000 tonnes of carbon (CO2e) by using less machinery and the associated reduction in hardstanding, the slurry treatment plant and the segment production facilities.

C.2.4 The single TBM method for tunnel construction would involve no physical changes to the permanent works of the Project's footprint presented in the DCO application and the plans which form part of it. It would not require the Applicant to seek new powers over land to deliver the works.

C.2.5 The overall construction programme set out in the DCO application would remain the same, whether the tunnels are constructed with one or two TBMs. The single TBM methodology provides an opportunity to bring the start of the first tunnel drive forward in the programme by approximately 10 months; as the quantum of temporary works required to construct the launch structure portal is reduced under a single TBM scenario compared to a two TBM scenario. The opportunity to start the tunnel drive earlier under the single TBM methodology does not, however, change the overall duration of the tunnelling elements of the construction programme as set out in the DCO application.

C.2.6 The duration of tunnelling activities under a single TBM scenario is longer than a two TBM scenario. Tunnel boring with a single TBM would last approximately 32 months in total, whereas the two TBM scenario would take 21 months. This equates to a tunnel boring programme difference of approximately 11 months between the scenarios. The single TBM scenario would start 10 months earlier than the two TBM scenario. This results in a difference of approximately one month duration between the two scenarios, without any further intervention. The tunnel fit out works would, however, be completed in a different sequence, which would absorb the one month difference between the two tunnel boring programmes.

C.2.7 The alternative single TBM methodology is therefore deliverable as part of the Project design and DCO application as submitted.

C.2.8 The Applicant would, however, like to provide clarity to Interested Parties and the Examining Authority that the assessment of construction effects reported in the ES is representative of both methodologies. The assessment provided within the DCO application presents a reasonable worst-case scenario in terms

of likely significant construction effects arising from either a single or two TBM methodology.

## Summary of engagement and consultation

C.2.9 A notification of proposed change was submitted to the Examining Authority in March 2023 [**AS-082** and **AS-083**] which included three proposed changes to the Project and a clarification on the construction methodology regarding the use of TBMs.

C.2.10 A targeted non-statutory consultation (referred to as the 'Minor Refinement Consultation') was carried out by the Applicant between 17 May 2023 and 19 June 2023 on the three proposed changes, and the clarification regarding a single TBM construction methodology. This consultation sought to ensure that all parties with a potential interest were made aware of the proposed changes and clarification and had the opportunity to provide comments on the consultation material in advance of the submission of the formal change application to the Examining Authority. Responses received through the consultation have subsequently been considered and where possible answers have been provided to stakeholders.

C.2.11 Within the Applicant's Deadline 1 Cover Letter [**REP1-001**] Annex C further information was provided regarding the clarification relating to the methodology for the tunnel construction including an explanation of the Applicant's assessment that to use one or two TBMs does not constitute a change to the application. This is because it was apparent from discussions held at the hearings in June 2023 that there remained uncertainty amongst some stakeholders that the option to use a single TBM is already included within the flexibility applied for in the DCO.

C.2.12 In response to the comments made by Gravesham Borough Council, the Applicant has provided the following commitment "*The tunnel boring machinery will be serviced from the North Portal. Material excavated by the tunnel boring machinery will be generated as a slurry and this will be transferred by pipeline through the tunnel to the North Portal for placement. Similarly tunnel segments and major services required to operate the tunnel boring machinery and erect the tunnel segments will be supplied from the North Portal.*"

C.2.13 This is proposed to be secured via 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan (Version 2.0) (Tracked and Clean) [**REP1-156** and **REP1-157**] of which Chapter 7 is the Register of Environmental Actions and Commitments (REAC). The commitment has the reference MW009. This was submitted at Deadline 1. This commitment is applicable whether one or two TBMS are utilised.

C.2.14 It was agreed during ISH1 that further information would be provided in writing by the Applicant; with the requirement set out as Action Point 2.This Appendix provides the response to that Action Point.

## The Applicant's position

C.2.15 The Applicant's position is that the use of a single TBM for the tunnel drive, if deemed appropriate by the Contractor, would not constitute a change to the DCO application. No change is required to the draft DCO or other application materials.

C.2.16 As set out in 9.10 Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**], the Applicant does not consider this to be a change for the following reasons:

a. The use of a single TBM is within the scope of the environmental assessments prepared for the Environmental Statement – i.e. it does not result in materially new or materially different effects.

b. The DCO application contains no constraint or commitment (either in the draft DCO or control plans) that requires the use of two TBMs. Thus, the application contains a proportionate degree of construction flexibility, which includes flexibility to employ a single TBM.

c. The decision on construction methodology, in terms of one or two TBMs, has not been made at this stage and would be made at detailed design and delivery stage.

d. It is commonplace for major DCO applications to allow for an appropriate degree of construction flexibility, and indeed in the case of a public project it is very much in the public interest, allowing for projects to be delivered at best value to the public purse – provided always that the controls provided for in the suite of DCO documents are adhered to.

C.2.17 The Transport Assessment [**APP-529** to **APP-538**] and Environmental Statement [**APP-138** to **APP-486** (as updated and reported in the Environmental Statement Addendum (as updated for version 2 and submitted at Deadline 2))] provide conclusions that remain robust for the purpose of making a decision on the Project irrespective of whether a single TBM or two TBMs are used. While there would be a small number of differences in the logistics associated with a single TBM approach, there would be no new or different significant environmental effects arising in comparison to those assessed and presented in the DCO application.

## C.3 Scenario for assessment

C.3.1 The scenario for assessment of the alternative methodology is described below. This makes comparison with the two TBM methodology as described in 6.1 Environmental Statement - Chapter 2 - Project Description [**APP-140**]. All references to dates in this description of the scenario relate to the dates used in the Application Documents and do not take account of the rephasing of construction announced by the Ministerial Statement in March 2023. Further information on the Ministerial Statement is provided in Appendix D.

C.3.2 As described within the Notification of Proposed Changes to the Planning Inspectorate [**AS-083**], the single TBM would be driven from the north to excavate and construct the first tunnel and, after arrival at the southern tunnel entrance compound, the TBM would be turned around so that it could complete the second tunnel drive back to the North Portal. Following the construction of the tunnels, the tunnel boring machinery would be decommissioned and removed from the northern tunnel entrance compound using the strategic road network and the River Thames from the nearby port facilities. All servicing of the south to north tunnel drive would be provided from the northern tunnel entrance compound through the earlier constructed tunnel.

C.3.3 The size of the permanent North and South Portals would remain unchanged from that proposed in the DCO application and assessed within the ES. All activities servicing the tunnel construction, including utility supplies, disposal of excavated material and slurry treatment would remain in the northern tunnel entrance compound as assessed within the DCO application.

C.3.4 The excavated material from the second tunnel drive would be pumped as slurry back through the first tunnel to the northern tunnel entrance compound for treatment and subsequent use in the permanent earthworks landscaping at Tilbury Fields; following the same approach proposed for the two TBM methodology and as assessed within the DCO application.

C.3.5 Under the single TBM scenario there is opportunity for a reduction in the size of the temporary North Portal structure used to launch the single TBM; as less space would be needed to launch one TBM than two. The reception structure for the returning TBM is still required on completion of the drives, but this element of the structure would be constructed in parallel with the drives. There is also the opportunity for the slurry plant in the northern tunnel entrance compound to be smaller in size to accommodate only a single TBM. This slurry plant would however operate for a longer duration while tunnel arisings are being removed from the tunnel drives consecutively rather than in parallel.

C.3.6 Under the single TBM scenario, no change would be required to the southern tunnel entrance compound beyond the temporary works needed to turn the

single TBM around, which would be undertaken within the footprint of the South Portal as previously set out and assessed within the DCO application.

C.3.7 The single TBM scenario would not change the traffic management measures required for the Project, nor would it change the provision of mitigation measures set out within the DCO application. The single TBM scenario would introduce a small variation in the number of construction compound vehicles in comparison to the two TBM scenario. The total number of such vehicles associated with the tunnels' construction is however consistent with the traffic volumes already assessed in the ES and traffic assessments,. Further detail on the changes within the traffic modelling is provided under the 'Traffic model review' heading below.

C.3.8 Table C.1 below provides a summary of key information on the single TBM approach of relevance to the assessment of environmental effects in comparison with what has been presented in the ES as submitted.

**Table C.1 Key information on single TBM approach**

| Single TBM approach details |
|---|
| • Construction of the tunnel structures using a single TBM rather than two separate TBMs.<br>• All activities servicing the tunnel construction (temporary utilities, tunnel arisings removal, slurry treatment etc) would remain in the northern tunnel entrance compound.<br>• In general, cross passage construction would commence from the south, moving north once the TBM has started driving back north. An exception may be preparatory works and formation of openings which may commence from the north following the progress of the first TBM drive. It is only the sequence that changes, with the method of cross passage construction remaining the same for both scenarios.<br>• TBM power and water supply would be provided from the northern tunnel entrance compound for both the single and two TBM scenarios and is proposed to be brought on earlier to allow tunnelling to start earlier under the single TBM scenario.<br>• The size of the permanent northern portal would be unchanged.<br>• There may be a reduction in the size of the temporary northern portal structure (up to 50%) used to launch the single TBM as less 'space' is needed to launch a single TBM. The reception structure for the single TBM would be constructed in the northern tunnel entrance compound in parallel with the tunnel drives.<br>• The TBM would require turning around at the southern tunnel entrance compound and repositioning for the drive north. This would be completed using cranes already included in the plant list for the south portal.<br>• The size of the southern portal in the temporary and permanent states would remain unchanged.<br>• The slurry plant in the northern tunnel entrance compound may be smaller in size (anticipated by approximately one third) but would operate for a longer duration while tunnel arisings are being removed from the tunnel.<br>• Decommissioning and removal of the single TBM would occur in the northern tunnel entrance compound, rather than in the southern tunnel entrance compound for the two TBM scenario.<br>• Traffic volumes would generally remain consistent with that assessed in the DCO application, the exceptions being: |

- only one TBM would be delivered to and then removed from the northern tunnel entrance compound via the Port of Tilbury. Delivery of the single TBM via the River Thames would reduce river vessel requirements, compared to the delivery of two TBMs.
- TBM(s) would no longer be removed from the southern tunnel entrance compound. River vessel movements to remove the TBM would be reduced for the single TBM, and via the northern tunnel entrance compound.
- It is anticipated there would be a small reduction in construction workforce numbers and associated traffic volumes in construction phases 5 to 8 at the northern tunnel entrance compound associated with operating a single TBM. There would be a small increase in phases 2 to 4. In phases 3 and 4 these increases are not deemed to be significant. The increases in phase 2 would be in the order of 230 two-way trips. The decreases in two-way trips in phases 5 to 8 are approximately 100, 120, 200, and 100 in each phase respectively.
- There would be a small workforce increase at the southern tunnel entrance compound (assumed 20 percent / less than80 staff) to facilitate the tunnelling and cross-passage construction from the south. It is however intended that, where feasible, staff movements would be planned from the northern compound through the completed first drive. The net effect in total workforce and associated traffic volumes at the southern tunnel entrance compound is a decrease in phase 7 and a negligible increase in phase 8; with no change in any other phase.
- There would be a minor increase in traffic volumes during construction phase 2 (of the traffic model) due to the increased number of workers at the northern tunnel entrance compound. However, the increase predicted in phase 2 would lead to a level of impact which is less than the impact modelled for phase 3 in the DCO application and does not represent a material change requiring additional traffic management measures or mitigation. It remains less than the assessed peak traffic numbers in phase 4. There would also be a minor decrease in traffic volumes in phases 5 to 8.

**Key assumptions**

- All materials (segments etc.) and utilities would be supplied from the northern tunnel entrance compound through drive 1 (north to south drive).
- All excavated material would be sent as slurry back to the northern tunnel entrance compound via drive 1 for treatment and placement at Tilbury Fields.
- The duration of earthwork activities at Tilbury Fields would likely be extended but would be at a lower intensity and remain within the overall DCO application programme.
- No change to the overall site power requirement (excluding TBM power which is reduced for a single TBM).
- No changes to other utilities required for the tunnels scope.
- TBM decommissioning and removal is anticipated to require the same number of Heavy Goods Vehicles and Abnormal Indivisible Loads as delivery.
- No significant increase in craneage required at the southern tunnel entrance compound as a large tower crane was already included for the southern portal assumptions.
- No increase in permanent works materials required at the southern tunnel entrance compound.
- The excavation of the South Portal cutting remains as per the DCO schedule.
- Launch cradle, shove frame and other relevant plant from the northern tunnel entrance compound would be relocated to the southern tunnel entrance compound, via the first tunnel for re-use in the southern tunnel entrance compound.
- Use of the River Thames for transportation would be reduced for the delivery of a single TBM.

**Alternative dates based on single TBM methodology**

- New programme for power and water to be available in January 2026 (to align with the earlier tunnelling activities under the single TBM methodology). The scope and design of the TBM power and water supply works would remain as per the DCO application.
- Reduced temporary works associated with single launch structure would allow a reduced timeframe for TBM set up.
- It is anticipated that by starting the tunnel drive earlier, the overall programme of works for tunnel construction would be similar using either methodology.
  - Drive 1 could commence approximately 10 months earlier than the programme presented in the DCO application.
  - Drive duration including the period for U-Turn and TBM head refurbishment would be approximately 32 months. The total drive duration for the two TBMs approach would be approximately 21 months.
  - Drive end in the single TBM scenario would be approximately one month later than for the two TBM approach.
  - The tunnel fit out works would, however, be completed in a different sequence, which would absorb the one month difference between the two tunnel boring programmes.

## Traffic model review

C.3.9 Information on the DCO application construction traffic modelling, and the associated construction assumptions is provided in 7.9 Transport Assessment [**APP-529**]. Using a single TBM rather than two machines would result in a change in staffing patterns at the northern and southern tunnel entrance compounds; primarily because a single TBM requires fewer staff to operate than two machines. The single TBM scenario would consequently introduce a small variation in the number of construction compound vehicles in each construction phase in comparison with the two TBM scenario.

C.3.10 An assessment of potential traffic changes resulting from minor changes in workforce numbers associated with the use of a single TBM was undertaken by the Applicant in January 2023.

C.3.11 Construction traffic demand levels were averaged over each of the 11 construction phases as considered in the DCO application, so that the model is predicting the average condition within each construction phase. The same assumptions regarding workforce shift arrangements (as set out in the Framework Construction Travel Plan [**APP-546**]) were applied in the modelling review undertaken for the single TBM scenario.

C.3.12 The 11 construction phases are shown in Table C.2 and remain the same as for the DCO application.

**Table C.2 Construction modelling eleven phase system**

| Phase | Start | End | Duration (Months) |
|---|---|---|---|
| Phase 1 | 01/01/2025 | 31/08/2025 | 8 |
| Phase 2 | 01/09/2025 | 28/02/2026 | 6 |
| Phase 3 | 01/03/2026 | 31/05/2026 | 3 |
| Phase 4 | 01/06/2026 | 31/10/2026 | 5 |
| Phase 5 | 01/11/2026 | 31/03/2027 | 5 |
| Phase 6 | 01/04/2026 | 31/08/2027 | 5 |
| Phase 7 | 01/09/2027 | 31/03/2028 | 7 |
| Phase 8 | 01/04/2028 | 30/11/2028 | 8 |
| Phase 9 | 01/12/2028 | 31/03/2029 | 4 |
| Phase 10 | 01/04/2029 | 31/07/2029 | 4 |
| Phase 11 | 01/08/2029 | 31/12/2030 | 17 |

C.3.13 The assessment of potential traffic changes under the single TBM scenario concluded the following key points of relevance to the consideration of environmental effects during construction.

C.3.14 As shown in Table C.3, for the southern tunnel entrance compound only construction phases 7 and 8 would see a change in demand; with construction phase 7 seeing a reduction in traffic trip numbers. The small increase in trips for construction phase 8 of approximately 5 two-way trips in the AM peak and interpeak, attributed to changes in workforce, is not considered a significant change. The existing assessment provided as part of the DCO application therefore represents a worst-case in relation to traffic associated with the southern tunnel entrance compound.

C.3.15 As shown in Table C.4, for the northern tunnel entrance compound only construction phases 2-4 have an increase in traffic numbers; also attributable to minor changes in workforce. The small increases for construction phase 3 (56 two-way trips in the AM peak and interpeak) and phase 4 (4 two-way trip in the AM and Interpeak) are not considered a significant change. There is also an increase in traffic in construction phase 2 associated with a single TBM compared to the previous assessment, however the level of impact is no worse than that expected for construction phase 3 (as documented in the Transport Assessment [**APP-529**]) and therefore the increase is not considered significant overall.

C.3.16 In terms of level of construction traffic impact, the existing two TBM construction modelling already provides all the information required to assess what the impact would be in a single TBM scenario, except that the level of impact in construction phase 2 within Tilbury only would be closer in scale to what is

reported in phase 3 for the DCO application. Construction traffic during the most intensive construction phase of the single TBM scenario would be slightly lower than for the most intensive phase of the two TBM scenario.

C.3.17 Given that in all other phases there is a negligible increase in staff flow or a large decrease, it is concluded that the two TBM modelling already carried out represents a robust worst-case assessment of both the single and two TBM scenarios.

**Table C.3 Changes to staff movements in southern tunnel entrance compound under the single TBM scenario**

| | Construction Phase | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Absolute change in number of trips (from the two TBM scenario)** | AM_origin (away from site) | 0 | 0 | 0 | 0 | 0 | 0 | -24 | 6 | 0 | 0 | 0 |
| | AM_destination (to site) | 0 | 0 | 0 | 0 | 0 | 0 | -34 | -1 | 0 | 0 | 0 |
| | Interpeak_origin | 0 | 0 | 0 | 0 | 0 | 0 | -24 | 6 | 0 | 0 | 0 |
| | Interpeak_destination | 0 | 0 | 0 | 0 | 0 | 0 | -24 | -2 | 0 | 0 | 0 |
| | PM_origin | 0 | 0 | 0 | 0 | 0 | 0 | -10 | -6 | 0 | 0 | 0 |
| | PM_destination | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table C.4 Changes in staff movements in northern tunnel entrance compound under the single TBM scenario**

| | Construction Phase | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Absolute change in number of trips (from the two TBM scenario)** | AM_origin (away from site) | 0 | 114 | 28 | 2 | -52 | -69 | -108 | -55 | 0 | 0 | 0 |
| | AM_destination (to site) | 0 | 114 | 28 | 2 | -52 | -69 | -108 | -55 | 0 | 0 | 0 |
| | Interpeak_origin | 0 | 114 | 28 | 2 | -52 | -69 | -108 | -55 | 0 | 0 | 0 |
| | Interpeak_destination | 0 | 114 | 28 | 2 | -52 | -69 | -108 | -55 | 0 | 0 | 0 |
| | PM_origin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | PM_destination | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## C.4 Assessment of environmental effects

C.4.1 A review has been undertaken of the potential for a single TBM scenario (as described in section C.3 of this appendix) to confirm that there would be no new or different likely significant construction effects compared to those reported in the DCO application which preseents the two TBM scenario. This review has considered the potential for new or different effects to be experienced by receptors within each environmental discipline under the single TBM scenario; with the conclusions summarised in Table C.5 below. A summary of the

significant effects reported within the submitted ES is included first for each discipline.

C.4.2 The first assessment column (column 3) of Table C.5 summarises the broad elements of the tunnel construction methodology that have potential implications for the conclusion of significant effects for each individual environmental discipline. Where these construction elements are relevant to the consideration of environmental effects for more than one environmental discipline, they are repeated against each relevant discipline.

C.4.3 The second assessment column (column 4) of Table C.5 describes the implications of the single TBM scenario on each of these construction elements and the consequence on the significant effects as reported in the ES for each environmental discipline.

C.4.4 The final assessment column (column 5) of Table C.5 summarises whether the effects of a single TBM scenario are consistent with those reported in relation to the two TBM scenario in the ES. The potential for any materially new or different significant effects to be experienced by receptors considered under each environmental discipline is recorded; along with any requirements for changes to mitigation set out within the DCO application.

## Table C.5 Environmental assessment of the single TBM scenario

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| Air Quality | There are no significant effects reported in ES Chapter 5 [APP-143] in relation to the TBM or associated tunnel construction activities. | • Construction or permanent works footprint.<br>• Overall duration of construction works.<br>• Number and/or type of construction vehicles/plant required.<br>• Traffic flows associated with construction traffic and traffic management.<br>• River vessel movements associated with construction. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the ES.<br>• The single TBM scenario would increase the required duration of specific construction activities such as the slurry plant and segment factory, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES.<br>• Duration of earthwork activities at Tilbury Fields is likely to be extended but would be at a lower intensity and remain within the overall DCO application programme. These activities would be managed by the same good practice dust management controls set out within the REAC. | As the single TBM scenario would not change the overall construction footprint, duration or vehicle requirements, and would result in only minor alterations to construction traffic flows within specific phases of the construction programme and a reduction in construction plant requirements; no new or different significant effects on air quality receptors beyond those already assessed in Chapter 5 of the ES [APP-143] are anticipated.<br>As described in Chapter 5 of the ES [APP-143], river vessel movements during the construction phase are expected to have negligible impacts on local air quality based on a worst-case scenario |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | • The single TBM scenario would not necessitate an increase in the number or change in type of vehicles/plant required during construction to those included within the traffic modelling.<br>• The change in construction traffic flows for the single TBM scenario compared with those anticipated for the two TBM scenario would not result in an overall increase in vehicle movements to those assumed in the ES, however these movements would occur over a longer period. The overall traffic generation is unlikely to materially change the assessment conclusions drawn for construction traffic air quality and dust under the two TBM scenario.<br>• Delivery of the single TBM via the River Thames would reduce river vessel requirements, compared to the delivery of two TBMs considered in the worst-case scenario presented in the DCO application. | where two TBMs are used. A reduction in river vessel requirements would not result in any new or different significant effects for air quality.<br>The construction air quality and dust assessment presented in Chapter 5 of the ES [**APP-143**] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are utilised.<br>No changes would be required to the proposed Traffic Management measures. |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| Cultural Heritage | A number of significant adverse effects to non-designated archaeological assets have been reported in ES Chapter 6 [AS-044] in relation to the construction of the northern tunnel entrance and the cut and cover works. | • Construction or permanent works footprint.<br>• Depth of excavations<br>• Overall duration of construction works.<br>• Off-site construction traffic noise levels and or visual impacts which could impact the setting of certain heritage assets. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the submitted ES. As a result there would be no change to direct impacts on heritage assets.<br>• There would be no increase to excavation depth requirements for the single TBM scenario. As a result there would be no change to direct impacts on cultural heritage receptors.<br>• The single TBM scenario would increase the required duration of specific construction activities, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES. Changes to the duration of specific construction activities would be contained within the overall | As the single TBM scenario would not change the overall construction footprint, excavation depth requirements or duration, and would not result in any change to the setting of heritage assets through changes in noise or visual effects; no new or different significant effects on cultural heritage receptors beyond those already assessed in Chapter 6 of the ES [AS-044] are anticipated.<br>The cultural heritage assessment presented in Chapter 6 of the ES [AS-044] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used. |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | modelled programme of construction works.<br>• The outputs of the noise and visual impact assessments remain unchanged under the single TBM scenario. No new off-site construction traffic related effects on noise or visual effects with the potential to impact heritage setting are therefore likely to arise from the single TBM scenario. | |
| Landscape and Visual | Several significant adverse landscape and visual effects have been reported in ES Chapter 7 [APP-145] in relation to the southern tunnel entrance compound, including construction of the southern tunnel entrance. | • Construction or permanent works footprint.<br>• Overall duration of construction works.<br>• Number and/or type of construction plant required.<br>• Buildings and storage areas within construction compounds.<br>• Construction traffic and traffic management.<br>• Temporary construction lighting. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the submitted ES.<br>• There would be no change to buildings, storage areas or other structures in the construction compounds with the potential to alter landscape or visual effects.<br>• The single TBM scenario would increase the required duration of specific construction activities, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained | As the single TBM scenario would not change the overall construction footprint or duration and would not increase construction plant requirements, in particular the use of cranes, and would not require a change in buildings, structures, storage areas or temporary lighting within the construction compounds, and would result in only minor alterations to construction traffic flows within specific phases of the |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES.<br>• The single TBM scenario would not necessitate an increase in the number or change in type of plant required during construction to those included within the traffic modelling. The amount, use and durations of tall plant (including cranes, the most visible above ground element associated with the TBM) remains unchanged at both compounds and remains in line with the DCO assessment.<br>• The change in construction traffic flows for the single TBM scenario compared with those anticipated for the two TBM scenario would not result in an overall increase in vehicle movements to those assumed in the ES, however, these movements would occur over a longer period. The overall traffic generation is unlikely to materially change the assessment conclusions drawn | construction programme and a reduction in construction plant requirements; no new or different significant effects on landscape and visual receptors beyond those already assessed in Chapter 7 of the ES [**APP-145**] are anticipated.<br>The landscape and visual assessment presented in Chapter 7 of the ES [**APP-145**] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used. |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | for construction traffic under the two TBM scenario.<br>• The single TBM scenario would not necessitate changes to temporary construction lighting. | |
| Terrestrial Biodiversity | A number of significant adverse effects to ecological receptors have been reported in ES Chapter 8 [APP-146] in relation to the northern tunnel entrance compound, including construction of the northern tunnel entrance. | • Construction or permanent works footprint.<br>• Overall duration of construction works.<br>• Operational noise and vibration levels from the TBM during the tunnel drives.<br>• Off-site construction traffic noise and vibration levels and air quality impacts which could impact biodiversity. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the submitted ES. As a result there would be no change to direct habitat loss.<br>• The single TBM scenario would increase the required duration of specific construction activities, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES.<br>• The single TBM would operate for longer but produce lower levels of underground noise and vibration due to a reduction in the number of TBMs being | As the single TBM scenario would not change the overall construction footprint, duration or vehicle requirements, and would result in only minor alterations to construction traffic flows within specific phases of the construction programme and a reduction in construction plant requirements; no new or different significant effects on terrestrial biodiversity receptors beyond those already assessed in Chapter 8 of the ES [APP-146] are anticipated.<br>The terrestrial biodiversity assessment presented in Chapter 8 of the ES [APP-146] is therefore considered to |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | driven simultaneously. As a result, there would be no change in the assessment of significant effects reported in the DCO application.<br>• The outputs of the noise and air quality assessments remain unchanged under the single TBM scenario. No new off-site construction traffic related effects on noise, vibration or air quality with the potential to disturb biodiversity are therefore likely to arise from the single TBM scenario. | provide a robust assessment based on a worst-case scenario where two TBMs are used. |
| Marine Biodiversity | No significant adverse effects to marine ecological receptors have been reported in Chapter 9 [**APP-147**] in relation to the construction of the Project. | • Construction or permanent works footprint.<br>• Overall duration of construction works.<br>• Operational noise and vibration levels from the TBM during the tunnel drives.<br>• Off-site construction traffic noise and vibration levels and air quality impacts which could impact biodiversity.<br>• River vessel movements associated with construction. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the ES. As a result there would be no change to direct habitat loss.<br>• The single TBM scenario would increase the required duration of specific construction activities, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled | As the single TBM scenario would not change the overall construction footprint, duration or vehicle requirements, and would result in only minor alterations to construction traffic flows within specific phases of the construction programme and a reduction in construction plant and river vessel requirements; no new or different significant |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | programme of tunnel construction works as assessed by the worst-case scenario presented in the ES.<br>• The single TBM would operate for longer but produce lower levels of underwater noise and vibration due to a reduction in the number of TBMs being driven simultaneously. As a result there would be no change in the assessment of effects reported in the DCO application.<br>• The outputs of the noise and air quality assessments remain unchanged under the single TBM scenario. No new off-site construction traffic related effects on noise, vibration or air quality with the potential to disturb biodiversity are therefore likely to arise from the single TBM scenario.<br>• Delivery of the single TBM via the River Thames would reduce river vessel requirements, compared to the delivery of two TBMs considered in the worst-case scenario presented in the DCO application. | effects on marine biodiversity receptors beyond those already assessed in Chapter 9 of the ES [APP-147] are anticipated.<br>The marine biodiversity assessment presented in Chapter 9 of the ES [APP-147] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used. |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| Geology and Soils | No significant adverse effects have been reported in ES Chapter 10 [APP-148] in relation to the TBM and tunnel construction for geology or contamination.<br>A significant effect has been reported for the Project's impacts to best and most versatile land. | • Construction or permanent works footprint.<br>• Mobilisation of contamination and/or mobilisation of ground gases due to groundwater control. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the ES. It is anticipated that temporary structures would be reduced and the permanent structure would remain unchanged. As a result there would be no change to land requirements or direct impacts on geology and soils, including best and most versatile land.<br>• The single TBM scenario would not result in any increased risk of mobilisation of contamination to groundwater or ground gases as commitments within the REAC for groundwater control during excavations remain unchanged from the DCO application. | As the single TBM scenario would not change the overall construction footprint and would not result in any increased risk of mobilisation of contamination or ground gases; no new or different significant effects on geology and soil receptors beyond those already assessed in Chapter 10 of the ES [APP-148] are anticipated.<br>The geology and soils assessment presented in Chapter 10 of the ES [APP-148] is therefore considered to provide a robust assessment based on a scenario where two TBMs are used. |
| Material Assets and Waste | A significant adverse effect has been reported in ES Chapter 11 [APP-149] against the Project's impact on landfill capacity in the study area. | • Volume of materials required.<br>• Volume of waste generated. | • The single TBM scenario has the potential to reduce material and equipment requirements, associated with the slurry treatment plant and the launch structure. This also has the potential to reduce waste | As the single TBM scenario would not change the overall construction material/waste balance, no new or different significant effects on |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | generation from the temporary works at the northern tunnel entrance compound.<br>• Material and waste handling associated with the tunnelling activities remain in line with the two TBM methodology, as there is not anticipated to be a change to the construction materials/ waste balance overall. There would be no change to the overall impact on landfill capacity. Material and waste 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. | material assets and waste receptors beyond those already assessed in Chapter 11 of the ES [APP-149] are anticipated. There would be no change to the overall significance of effects on landfill capacity.<br>The material assets and waste assessment presented in Chapter 11 of the ES [APP-149] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used.<br>No changes would be required to the Outline Site Waste Management Plan [APP-337]or the Outline Materials Handling Plan [APP-338]. |
| Noise and Vibration | There are no significant effects reported within the locality of these works during | • Construction or permanent works footprint.<br>• Overall duration of construction works. | • The single TBM scenario would not increase the footprint of the construction works beyond the | As the single TBM scenario would not change the overall construction footprint, duration or vehicle |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | construction in ES Chapter 12 [APP-150]. | • Number and/or type of construction vehicles/plant required.<br>• Traffic flows associated with construction traffic and traffic management.<br>• River vessel movements associated with construction.<br>• Operational noise and vibration levels from the TBM during the tunnel drives. | worst-case scenario presented in the ES.<br>• The single TBM scenario would increase the required duration of specific construction activities such as the slurry plant and segment factory, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES.<br>• The single TBM scenario would not necessitate an increase in the number or change in type of vehicles/plant required during construction to those included within the traffic modelling.<br>• The change in construction traffic flows for the single TBM scenario compared with those anticipated for the two TBM scenario would not result in an overall increase in vehicle movements to those assumed in the ES, however these movements would occur over a | requirements, and would result in only minor alterations to construction traffic flows within specific phases of the construction programme and a reduction in construction plant and river vessel requirements; no new or different significant effects on noise and vibration receptors beyond those already assessed in Chapter 12 of the ES [APP-150] are anticipated.<br>The construction noise and vibration assessment presented in Chapter 12 of the ES [APP-150] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used.<br>The vibration assessment of the use of two TBMs that is reported in Chapter 12 of the ES |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | longer period. The overall traffic generation is unlikely to materially change the assessment conclusions for construction traffic noise and vibration under the two TBM scenario.<br>• Delivery of the single TBM via the River Thames would reduce river vessel requirements, compared to the delivery of two TBMs considered in the worst-case scenario presented in the DCO application.<br>• The single TBM would operate for longer but would not produce higher levels of underground/underwater noise and vibration than reported in the ES due to a reduction in the number of TBMs being driven simultaneously. As a result there would be no increase to the overall noise and vibration effects reported in the DCO application. | [APP-150] would be unchanged since the single TBM would not generate higher levels of underwater/underground noise and vibration than the use of two TBMs. The longer use of the single TBM would not introduce new or different significant effects.<br>No changes would be required to the proposed Traffic Management measures or delivery of proposed noise mitigation in the REAC. |
| Population and Human Health | There are no significant effects reported within the locality of these works during | • Construction or permanent works footprint.<br>• Overall duration of construction works. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the ES. As a result there | As the single TBM scenario would not change the overall construction footprint, duration or vehicle |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | construction in ES Chapter 13 [APP-151]. | • Number and/or type of construction vehicles/plant required.<br>• Traffic flows associated with construction traffic and traffic management.<br>• Construction workforce requirements. | would be no change to land take or direct physical impacts on population and human health receptors.<br>• The single TBM scenario would increase the required duration of specific construction activities, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES. As a result there would be no change to the overall impacts on local communities.<br>• The single TBM scenario would not necessitate an increase in the number or change in type of vehicles/plant required during construction to those included within the traffic modelling.<br>• The change in construction traffic flows for the single TBM scenario compared with those anticipated for the two TBM scenario would not result in an | requirements, and would result in only minor alterations to the construction workforce, construction traffic flows within specific phases of the construction programme and a reduction in construction plant requirements; no new or different significant effects on population and human health receptors beyond those already assessed in Chapter 13 of the ES [APP-151] are anticipated.<br>The population and human health assessment presented in Chapter 13 of the ES [APP-151] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used.<br>No changes would be required to the proposed Traffic Management |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | overall increase in vehicle movements to those assumed in the ES, however these movements would occur over a longer period. The overall traffic generation is unlikely to materially change the assessment conclusions drawn for construction traffic under the two TBM scenario. The outputs of the noise and air quality assessments remain unchanged under the single TBM scenario. No new off-site construction traffic related effects on noise, vibration or air quality with the potential to affect population and human health receptors are therefore likely to arise from the single TBM scenario.<br>• The single TBM scenario has the potential to give rise to a reduction in workforce numbers in the northern tunnel entrance compound associated with the reduced number of TBMs. It also has the potential for a small increase in workforce numbers in the southern tunnel entrance compound (worst case of approximately 20 percent, no | measures, REAC commitments, the Framework Construction Travel Plan [**APP-546**] or Worker Accommodation Report [**APP-551**]. |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | more than 80 workers) associated with staffing the cross passage construction. The small potential increase in workforce numbers in the southern tunnel entrance compound is unlikely to change the impacts reported in the ES. | |
| Road Drainage and the Water Environment | There are no significant effects reported within the locality of these works during construction in ES Chapter 14 [APP-152]. | • Construction or permanent works footprint.<br>• Depth level of excavations<br>• Overall duration of construction works.<br>• Flood compensation. | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the ES. There would also be no changes to the number of proposed grout blocks associated with the ground protection tunnel.<br>• The groundwater assessment assumed a worst-case scenario for the depth level of excavation for the North Portal for both the temporary and permanent works. There would be no increase to excavation depth level requirements for the single TBM scenario. As a result there would be no change to direct impacts on road drainage or water environment receptors.<br>• The single TBM scenario would not increase the overall duration | As the single TBM scenario would not change the overall construction footprint, excavation depth requirements, flood risk or duration; no new or different significant effects on groundwater or surface water receptors beyond those already assessed in Chapter 14 of the ES [APP-152] are anticipated.<br>The road drainage and water environment assessment presented in Chapter 14 of the ES [APP-152] is therefore considered to provide a robust assessment based on a worst-case scenario |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | of works beyond the worst-case scenario presented in the ES.<br>• The single TBM scenario would not alter flood risk or the delivery or effectiveness of requirements for flood mitigation and compensation. | where two TBMs are used.<br>No changes would be required to flood mitigation measures or compensation.<br>The proposed commitments set out in the REAC remain in place for control of groundwater and protection of surface water and groundwater quality. |
| Climate | There are no significant effects reported in relation to the tunnel construction in ES Chapter 15 [APP-153]. | • Number and/or type of construction vehicles/plant required.<br>• Traffic flows associated with construction traffic and traffic management.<br>• Volume of materials and power required. | • The single TBM scenario would not necessitate an increase in the number or change in type of vehicles/plant required during construction to those included within the traffic modelling.<br>• The change in construction traffic flows for the single TBM scenario compared with those anticipated for the two TBM scenario would not result in an overall increase in vehicle movements to those assumed in the ES, however these movements would occur over a longer period. The overall | The single TBM scenario would result in a reduction in construction plant requirements, leading to a reduction in embodied carbon. No new or different likely significant effects are anticipated on climate beyond those already assessed in Chapter 15 of the ES [APP-153]. The reduction in emissions associated with a single TBM methodology would represent a minor |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | | | emissions associated with construction traffic would not change.<br>• The single TBM scenario would be anticipated to result in a reduction in embodied carbon compared to two TBMs. For example due to the reduction in steel consumption and associated supporting facilities.<br>• It is estimated that the single TBM scenario would result in a reduction of 38,000 $tCO_2e$ when compared to a two-TBM scenario.<br>• Under the single TBM scenario peak power would be reduced but power would be required earlier in the programme. There would be no change to emissions as a result of the change to power demand and profile. | reduction in overall Project emissions.<br>The construction climate assessment presented in Chapter 15 of the ES [APP-153] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used. |
| Cumulative Effects Assessment | • Several significant cumulative intra-project and inter-project effects have been reported within the locality of these works during | • Construction or permanent works footprint.<br>• Overall duration of construction works.<br>• Intra-project effects | • The single TBM scenario would not increase the footprint of the construction works beyond the worst-case scenario presented in the ES.<br>• The single TBM scenario would increase the required duration of | As the single TBM scenario would not change the overall construction footprint or duration, and would not result in any new or different significant |

| Environmental topic | Reported significant effects in the ES | Key construction influences on environmental assessments | Implications of a single TBM methodology | Consistency with significant effects reported in the ES |
|---|---|---|---|---|
| | construction in ES Chapter 16 [APP-154]. | | specific construction activities, albeit at a lower intensity than necessary for two machines. Changes to the duration of specific construction activities would however be contained within the overall modelled programme of tunnel construction works as assessed by the worst-case scenario presented in the ES. As a result there would be no change to the conclusions of inter-project effects reported in the cumulative effects assessment.<br>• The outputs of the various environmental discipline assessments (as captured in this table) remain unchanged under the single TBM scenario. No new significant intra-project effects are therefore likely to arise from the single TBM scenario. | effects for any of the environmental disciplines; no new or different significant intra-project or inter-project effects beyond those already assessed in Chapter 16 of the ES [APP-154] are anticipated.<br>The cumulative effects assessment presented in Chapter 16 of the ES [APP-154] is therefore considered to provide a robust assessment based on a worst-case scenario where two TBMs are used. |

C.4.5 In conclusion, the review has confirmed that the ES as submitted, represents the reasonable worst-case scenario in terms of likely significant construction effects arising from either TBM methodology for all receptors groups. The Applicant considers that the ES provides conclusions that remain robust for the purpose of making a decision on the Project irrespective of whether a single TBM or two TBMs are used.

# Appendix D Appraisal of effects from the two-year rephasing of construction

## D.1 Introduction

D.1.1 This Appendix has been prepared to provide an appraisal of the environmental effects arising from the Ministerial Statement made by the Secretary of State for Transport in March 2023 in relation to the A122 Lower Thames Crossing (the Project). The Ministerial Statement revised the timing of construction and consequently the date for opening the Project to traffic. This appraisal has considered the potential for change in the effects reported in Application Documents 6.1 to 6.4 Environmental Statement [**APP-138** to [**APP-486**] submitted as part of the Development Consent Order (DCO) application for the Project in October 2022.

D.1.2 This Appendix has been prepared in response to the action identified by the Examining Authority at Issue Specific Hearing 1 (ISH1) on 21 June 2023. The agenda for the hearing [**EV-014**] included item 4c) '*Effects of the two-year rephasing in capital funding*'. This issue was discussed during the hearing as documented in the Transcript [**EV-023**] and in 9.10 Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**]. It was agreed during the hearing that further information would be provided by National Highways in writing. The Action Points from ISH1 - 21 June 2023 [**EV-023a**] identified Action Point 1 as follows:

"*Following the announcement of a two-year rephasing of the proposed LTC development by the SoST on 9 March 2023, please provide a tabulated addendum to the ES, setting out an appraisal of the effect of the revised construction timing and works duration changes flowing from that announcement, undertaken for each component of the Environmental Statement (ES) analysis. This should include consideration of the time sequence for and outcome of committed elements of Freeport development which it has been suggested will now be delivered concurrently with aspects of the rephased LTC project.*"

## D.2 Background

### Ministerial statement

D.2.1 On 9 March 2023, a Written Ministerial Statement was made by the Secretary of State for Transport. This statement made reference to the Lower Thames Crossing: '*To date we have spent over £800 million on planning the Lower Thames Crossing. It is one of the largest planning applications ever, and it is important we get this right. We remain committed to the Lower Thames Crossing, and the development consent order process will be an important*

*opportunity to consult further to ensure there is an effective and deliverable plan. In order to allow time for this process and given wider pressures on [Road Investment Strategy] RIS, we will look to rephase construction by two years.*'

## Summary of engagement and consultation

D.2.2 On 21 March 2023, the Examining Authority asked about the implications of the Ministerial Statement on the Project and the DCO application in their Procedural Decision [**PD-11**]. National Highways provided a response to this [**AS-086**] on 30 March 2023, which set out the Applicant's position.

D.2.3 The matter was further discussed in ISH 1 as set out above. It was agreed during ISH1 that further information would be provided in writing by the Applicant; with the requirement set out as Action Point 1. This Appendix provides the response to that Action Point.

## The Applicant's position

D.2.4 The Applicant's position is as set out in the response on 30 March 2023 [**AS-086**] and maintained in subsequent communications. This is as follows:

a. The Application documents are based on a proposed construction programme and an indicative opening year, summarised in 6.1 Environmental Statement Chapter 2 – Project Description [APP-140]. '*2.5.39 Following the DCO Grant there would be preparatory works, referred to in the draft DCO (Application Document 3.1) as preliminary works taking place in 2024. The main construction period for the Project would start in early 2025, with the road being open for traffic in late 2030.*'

b. The Application documents make clear that '*as with all large projects there is a level of uncertainty over the construction programme, which will be refined once contractors are appointed*'. It is then made clear that '*The 2030 opening year has been selected as the basis for the assessments and is representative of the reasonable worst-case scenario*'.

c. The Transport Assessment [**APP-529** to **APP-538**] and Environmental Statement [**APP-138** to **APP-486** (as updated and reported in the Environmental Statement Addendum (as updated for version 2 and submitted at Deadline 2))] provide conclusions that remain robust for the purpose of making a decision on the Project. The Applicant considers that, in line with other DCO applications, the draft DCO permits a period of five years to begin development. Accordingly, the application accommodates a proportionate degree for flexibility around the timing of construction, which would allow for the two-year rephasing. The level of flexibility sought here is no different to the level of flexibility contained in many other, if not all, DCO applications.

d. No change is required to the draft DCO or other application documents.

## D.3 Scenario for assessment

D.3.1 The proposed rephasing of construction referenced in the Ministerial Statement leads to movement in the indicative start of construction and the 'open for traffic' date by two years from 2025 to 2027 and 2030 to 2032 respectively. Preliminary works would start in 2026 instead of 2024. The scenario that is assessed for this Appendix has assumed that there is no funding available for earlier works, and there are no changes to the phasing of works within the construction programme. The construction programme and the assumed durations for individual works elements would remain as outlined in Environmental Statement - Chapter 2 - Project Description [**APP-140**], but delayed by two whole years. The construction methodology assumed in this scenario is as described in Environmental Statement - Chapter 2 - Project Description [**APP-140**] and does not take account of the alternative tunnel construction methodology, as discussed in Appendix C of the Environmental Statement Addendum.

D.3.2 There is no current plan to bring forward any individual works into the two years between 2024 and 2026, and this has not been included in the assessment presented in this Appendix.

D.3.3 The proposed two year delay to the start of construction would be used to develop detailed designs, prepare construction plans, and discharge the post-consent approvals required as set out in the draft DCO. This would ensure that when works start, they are well planned and can be delivered as quickly and efficiently as possible. As suggested in the Ministerial Statement, this time would be used to allow for further stakeholder engagement to prepare the most effective and deliverable plan for construction of the Project. The assessment of this scenario reflects the reasonable worst-case resulting from the two year change to the construction dates, and does not take into account any opportunities that may arise from detailed design and planning of the revised construction programme.

D.3.4 There are external factors that would affect the forecasts and projections related to the construction phase and opening year, as set out below. The assessments presented in Section D.4 of this Appendix take these into account where appropriate.

a. Two years of additional growth in the population and associated traffic levels

b. Changes in the vehicle fleet, with an increase in the proportion of the electric fleet

c. The timing of the construction and operation of the Project alongside that of other developments

D.3.5 To allow a 'like for like' comparison of likely significant effects associated with the proposed two-year rephasing communicated in the Ministerial Statement, the scenario that has been assessed is based on the same underlying baseline data that was presented in the ES and which remains valid for the purposes of this assessment.

## Traffic modelling and forecasts

D.3.6 The environmental assessments presented in the DCO application make use of traffic data derived from the Project transport modelling. This modelling identified assessment years for construction (2030) and operation (opening year 2030 and design year 2045). The consequences from a two year delay to the start of construction and a revision to the opening year on the traffic modelling and the environmental assessment of effects related to traffic are considered below.

### Construction phase

D.3.7 The assessment of construction effects has used a representative scenario from the construction modelling using outputs from the Project's transport model. This provides an extensive quantitative assessment of the forecast impact of construction works on the road network, using the same traffic baseline and forecasting work that informs the operational modelling.

D.3.8 The construction modelling assessment used the 2030 Do minimum (i.e. without the Project) trip demand as the base year for the background (i.e. non-construction) trips. With construction expected to run from 2025 to 2030, this essentially overestimated the amount of traffic in the model for the years 2025 to 2029. The net effect therefore was that the construction modelling assessment reflected a worst-case position and assumed higher levels of traffic during the construction phase than is likely to be the case.

D.3.9 This scenario assumes that the construction phase would run from 2027 to 2032, which would mean existing flows on the network would likely increase as a result of year on year traffic growth. Continuing to use the existing construction modelling assessment (based on 2030 levels of demand) to represent the impacts under the revised programme, assumes that years 2027 to 2029 would continue to have overestimated levels of traffic, but years 2031 and 2032 would have underestimated levels. The net effect is that the assessments of this scenario, which reflect the construction period as a whole, rather than by individual year, would be based on an overestimate of the amount of traffic, but to a lesser degree.

### Operation

D.3.10 The operational phase transport modelling has forecast a Do Minimum (without the Project) (DM) scenario, where the Project is not built but where changes to the road network and planned development that is forecast to go ahead

(whether the Project is built or not) are included. The transport model also predicts the use of both the Project and other parts of the road network if the Project is built (the Do Something (DS) scenario). The transport model predicted traffic conditions on the road network in 2030; the Project's opening year and 2045; the Project's design year which is 15 years after opening.

D.3.11 As explained in 7.7 Combined Modelling and Appraisal Report [APP-518] forecasts of traffic conditions in the future were prepared for 2030 and 2045. The level of traffic growth for cars in the future was taken from the Department for Transport National Trip End Model (NTEM), known as the TEMPro 7.2 forecasts.

D.3.12 The TEMPro 7.2 forecasts for traffic growth for the revised opening year and design year have been identified. The effect of delaying road opening by two years is to add approximately 1.4% to 2.6% (depending on location) extra traffic growth to 2032, compared with growth to 2030. The actual traffic in 2032 is, of course, the same. Growth to 2047, compared with growth to 2045 adds an extra 1.1% to 2.3%. In either scenario, however, the Project would be operating with the same levels of traffic in 2045 and 2047.

D.3.13 Table D.1 below details the growth levels, based on TEMPro/NTEM v7.2.

**Table D.1 Changes to forecast traffic growth from two-year rephasing**

| | NTEM 7.2 2016 - 2030 growth | NTEM 7.2 2016 - 2032 growth | Difference | NTEM 7.2 2016 - 2045 growth | NTEM 7.2 2016 - 2047 growth | Difference |
|---|---|---|---|---|---|---|
| Basildon | 12.2% | 13.6% | 1.4% | 22.8% | 24.2% | 1.4% |
| Brentwood | 9.5% | 10.7% | 1.2% | 18.1% | 19.2% | 1.1% |
| Thurrock | 21.1% | 23.7% | 2.6% | 39.2% | 41.6% | 2.3% |
| Havering | 16.5% | 18.6% | 2.1% | 30.7% | 32.4% | 1.7% |
| Dartford | 18.0% | 20.3% | 2.2% | 33.1% | 35.0% | 1.8% |
| Gravesham | 15.7% | 17.6% | 1.9% | 28.4% | 30.0% | 1.6% |
| Maidstone | 15.5% | 17.3% | 1.8% | 27.9% | 29.4% | 1.6% |
| Medway | 14.4% | 16.0% | 1.6% | 25.9% | 27.4% | 1.5% |
| Sevenoaks | 9.1% | 10.3% | 1.1% | 17.4% | 18.5% | 1.1% |
| Tonbridge and Malling | 14.1% | 15.9% | 1.7% | 26.4% | 27.9% | 1.5% |

## Assumptions and limitations

D.3.14 The scenario described above has been considered in the assessment of the effects from the delay to the start of construction and the revised opening year. These assessments have used the information outlined above related to traffic

data, but modelling has not been completed to inform the conclusion of the traffic based assessment. Qualitative assessment based on professional judgement has been used to inform the conclusions set out in section D.4 of this Appendix.

D.3.15 There are potential opportunities that could arise as a consequence of the delay to start of construction. These opportunities relate to the additional time available to develop detailed designs, engage with stakeholders and prepare construction plans. These activities may result in opportunities to establish various environmental enhancement and mitigation measures that may reduce impacts on communities and the surrounding environment, or to further develop the design of mitigation measures. These opportunities have not been included in the assessments of the revised scenario, so that the appraisal reflects a revised worst-case scenario.

## D.4 Assessment of environmental effects

D.4.1 An appraisal has been undertaken of the potential for the two year delay scenario (as described in section C.3 of this Appendix), to change the environmental effects reported in the ES, as submitted with the DCO application. This appraisal has considered the potential for changes experienced by receptors within each environmental discipline; with the conclusions summarised in Table D.2 below.

D.4.2 The first assessment column in the table identifies the influence that the construction dates and opening year and design year dates have on the assessments presented in the ES. The second assessment column identifies the implications for the assessment conclusions from the changes to the dates.

## Table D.2 Environmental assessment of the two-year rephasing

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| Air quality – construction | The air quality assessment presented in 6.1 Environmental Statement - Chapter 5 - Air Quality [APP-143] used outputs from the traffic modelling. The construction traffic modelling presented in the DCO application assumes construction takes place between 2025 and 2030. The base year for background traffic levels used in the construction traffic modelling is 2030 which reflects a reasonable worst-case. | The construction traffic model reflects one scenario allowing for a suitable assessment of the construction impacts. The peak impact on traffic flows from construction related traffic movements would still occur prior to 2030, and the slight increase in baseline traffic in the later stages of the delivery programme would not lead to significant changes in traffic impacts. Therefore, the assessment continues to reflect a reasonable scenario. This would not be expected to result in a material change in the significance of air quality effects reported for the construction phase in the ES. |
| Air quality – operation human health effects | The operational air quality assessment presented in 6.1 Environmental Statement - Chapter 5 - Air Quality [APP-143] is based on the traffic modelling assuming the opening year is 2030. | Defra have advised that the Emission Factor Toolkit (EFT) v11 used in the assessment presented in the application documents should not be used to generate emission factors post 2030 for local air quality assessments. The current advice from Defra is that the emission factors for between 2031 and 2050 have been provided to support climate assessments and appraisals only. In addition, the latest year available for the background air quality maps, nitrogen oxides ($NO_x$) sector removal tool and the $NO_x$ to nitrogen dioxide ($NO_2$) calculator is 2030.<br>It is however expected that $NO_x$ and Particulate Matter smaller than 10 micrometers ($PM_{10}$) per vehicle emissions would be lower in 2032 compared to 2030, as a higher proportion of the national vehicle fleet would be comprised of electric vehicles and vehicles which meet Euro 6/VI emissions standards. This would result in lower air quality impacts than presented in the air quality assessment if it were assumed that there was no change to traffic flows between 2030 and 2032. The effect of delaying road opening by two years is to |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | | add approximately 1.4% to 2.6% (depending on location) extra traffic growth to 2032 compared with growth to 2030. This is not expected to result in a material change to the significance of operational air quality effects for human health reported in the ES. |
| Air quality – operation ecological effects | The operational air quality assessment presented in 6.1 Environmental Statement - Chapter 5 - Air Quality [**APP-143**] is based on the traffic modelling assuming the opening year is 2030. | As described directly above for air quality operation human health effects, the latest $NO_x$ vehicle emission factors available in EFT are for 2030. $NO_x$ emission factors are however expected to be lower in 2032 compared to 2030, and so it is likely that changes in nitrogen deposition would be lower than reported in the air quality assessment given that $NO_x$ is also used to calculate the ammonia ($NH_3$) contribution to nitrogen deposition (assuming no change to traffic flows between 2030 and 2032).<br>The effect of delaying road opening by two years is to add approximately 1.4% to 2.6% (depending on location) extra traffic growth to 2032 compared with growth to 2030, and this is not expected to result in a material change to the significance of operational air quality effects for ecology reported in the ES. |
| Cultural Heritage – construction | The cultural heritage baseline, collected from desk-based sources and fieldwork, has been collected at various times during the Project development, between 2017 and 2021. Future baseline is also considered in 6.1 Environmental Statement - Chapter 6 - Cultural Heritage [**APP-144**], with the conclusion that little change in baseline is expected without the Project.<br>Aspects of the cultural heritage assessment are based on the noise assessment, which uses traffic data and the date related | The revised dates for construction do not impact the cultural heritage baseline used for assessment and consequently this is not expected to result in a material change to the significance of construction related cultural heritage effects reported in the ES.<br>Change in the off-site construction traffic noise assessment could affect assessment of impact through change to setting, for certain heritage assets. However, as set out below in relation to noise effects during construction, it is not anticipated that this would result in materially different effects to those reported in the ES. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | assumptions as set out in the noise rows of this table. | |
| Cultural Heritage – operation | The cultural heritage baseline, collected from desk-based sources and fieldwork, has been collected at various times during the Project development, between 2017 and 2021. Future baseline is also considered in 6.1 Environmental Statement - Chapter 6 - Cultural Heritage [**APP-144**], with the conclusion that little change in baseline is expected without the Project.<br>Aspects of the cultural heritage assessment are based on the noise assessment, which uses traffic data and the date related assumptions as set out in the noise rows of this table. | The revised opening year does not impact the cultural heritage baseline used for assessment and consequently this is not expected to result in a material change to the significance of operational phase cultural heritage effects reported in the ES.<br>Change in the operational traffic noise assessment could affect assessment of impact through change to setting, for certain heritage assets. However, as set out below in relation to noise effects during operation, it is not anticipated that this would result in materially different effects to those reported in the ES. |
| Landscape and visual – construction | Landscape and visual baseline field surveys have been undertaken at multiple stages of the Project development from 2017 until summer 2022. 6.1 Environmental Statement - Chapter 7 - Landscape and Visual [**APP-145**] also considers future baseline i.e. anticipated changes to the | There could be small changes in the landscape and visual future baseline as a result of the delay to the start of construction, for example, the introduction of new features into views or new visual receptors. However, given the relatively short delay, it is not anticipated that there would be notable changes in the landscape and visual baseline.<br>For the main landscape and visual impact assessment, there would therefore be no implications from the delay to the start of construction because, with the exception of Appendix 7.11 (see below), the assessment in Chapter 7 - Landscape and Visual [**APP-145**] considers the effects of the Project on the baseline landscape and visual receptors which are not anticipated to change notably in two years. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | existing baseline over time in the absence of the Project.<br>Appendix 7.11 Traffic and Noise Effects on the Kent Downs Area of Outstanding Natural Beauty, used outputs from the traffic modelling. The construction traffic modelling presented in the DCO application assumes construction takes place between 2025 and 2030. The base year for background traffic levels used in the construction traffic modelling is 2030 which reflects a reasonable worst-case.<br>The assessments presented in the ES have assumed that that the main construction period would start in early 2025, and be complete in late 2030. | For Appendix 7.11 the assessment of construction effects is based on traffic modelling for the construction phase, which uses a 2030 base year. The 2030 base year previously represented a worst-case for background traffic levels and with the change to construction dates represents a mid-point during the construction period. This is still considered to reflect a robust assessment scenario and the assessments presented in Appendix 7.11 remain valid.<br>It is not therefore expected that there would be a material change in the significance of construction landscape and visual effects reported in the ES. |
| Landscape and visual – operation | Landscape and visual baseline field surveys have been undertaken at multiple stages of the Project development from 2017 until summer 2022. 6.1 Environmental Statement - Chapter 7 - Landscape and Visual [**APP-145**] also considers future baseline i.e. anticipated changes to the | Landscape and visual effects are assessed in the opening year (2030) and 15 years after opening in the design year (2045). Moving the opening year and design year back by two years would not change the current assessment, as limited change is anticipated in the landscape and visual baseline from the delay to road opening.<br>However, for Appendix 7.11 the assessment of operation effects is based on traffic modelling for specific years in 2030 and 2045 which forecasts lower levels of baseline traffic than for the revised 2032 and 2047 dates. The assessment of traffic and noise impacts require a comparison between the DM and DS scenarios, therefore the effect of the two year delay to opening year would apply equally to both scenarios. It is anticipated that the magnitude of |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | existing baseline over time in the absence of the Project.<br>For Appendix 7.11 Traffic and Noise Effects on the Kent Downs Area of Outstanding Natural Beauty, the Project's transport model has a base year of 2016. This is reported within the Combined Modelling and Appraisal Report - Appendix B - the Transport Model Package (Para 3.1.1 of Application Document 7.7).<br>The assessments presented in the ES have assumed that that the road would be open for traffic in late 2030. | change between these scenarios would remain constant meaning it is unlikely to materially change the conclusions of the ES.<br>It is not therefore expected that there would be a material change in the significance of construction landscape and visual effects reported in the ES. |
| Terrestrial biodiversity – construction | The terrestrial biodiversity baseline was established through data collection and field surveys that were undertaken at multiple stages of the Project development from spring 2017 until summer 2022. 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [**APP-146**] also considers future baseline i.e. anticipated changes to the existing baseline over time in the absence of the Project. | The baseline used in the terrestrial biodiversity assessment represents a precautionary position on the designated and non-designated sites, the habitats present, and the species that are known to be present within suitable habitats as well as the quality of those habitats.<br>Pre-construction surveys for species, particularly European protected species, would be carried out prior to any construction works to establish a baseline for the submission of a Natural England development species licence, and this would allow for a detailed mitigation strategy to be developed prior to construction. This is detailed in 3.1 Draft Development Consent Order (Version 3.0) (Clean and Tracked) [**REP1-042** and **REP1-043**] and supported by REAC commitment TB015 in 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan (Version 2.0) (Tracked and Clean) [**REP1-156** and **REP1-157**]. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | Aspects of the terrestrial biodiversity assessment are based on the air quality and noise assessments, which use traffic data and the date related assumptions as set out in the air quality and noise rows of this table. | As such, the two-year delay would have minimal change on the baseline of the site, and therefore would likely have no material change to the significance of effects on terrestrial biodiversity receptors as reported in the ES. |
| Terrestrial biodiversity – operation | The terrestrial biodiversity baseline was established through data collection and field surveys that were undertaken at multiple stages of the Project development from spring 2017 until summer 2022. 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [**APP-146**] also considers future baseline i.e. anticipated changes to the existing baseline over time in the absence of the Project.<br>Elements of the terrestrial biodiversity assessment are based on the assessment of effects for air quality and noise. The date-related assumptions set out for those topics, such as those related to traffic data, apply to the information used in the terrestrial biodiversity assessment. | The implications of the two year delay to road opening on the air quality ecological effects are set out in the air quality rows of this table (above).<br>It is anticipated that noise related effects on ecological receptors as a result of the change to opening year would be minimal for the reasons set out below which describe the operational noise related implication of the change to the opening year.<br>As detailed above, the terrestrial biodiversity baseline is not likely to considerably change with the two-year delay to road opening, however further surveys are planned to establish the protected species present prior to any construction works. It is not anticipated that any change in baseline would have implications for operation effects. Overall, it is considered unlikely that there would be material change to the significance of terrestrial biodiversity effects presented in the ES. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| Marine Biodiversity – construction | The marine biodiversity baseline was established through third party data collection and field surveys that were undertaken at multiple stages of the Project development from 2017 until summer 2022. 6.1 Environmental Statement - Chapter 9 - Marine Biodiversity [**APP-147**] also considers future baseline i.e. anticipated changes to the existing baseline over time in the absence of the Project. | Baseline conditions of benthic communities in the Thames estuary are known to be relatively stable, and it is assumed that there are no drivers that would result in any significant change to species distribution or density. Given that there would be limited change to the baseline over the timescale of the two year delay to the start of construction, it is not anticipated that there would be a material change to the conclusions presented in the ES. |
| Marine biodiversity – operation | The marine biodiversity baseline was established through third party data collection and field surveys that were undertaken at multiple stages of the Project development from 2017 until summer 2022. 6.1 Environmental Statement - Chapter 9 - Marine Biodiversity [**APP-147**] also considers future baseline i.e. anticipated changes to the existing baseline over time in the absence of the Project.<br>Elements of the marine biodiversity assessment are | Underwater noise from traffic using the tunnels was identified as a potential pathway for effects on marine biodiversity receptors. The assessment concluded that there would not be significant effects on marine biodiversity receptors. The proposed change to the opening year and consequent change to traffic flows would not significantly change the conclusions of the assessment in the DCO application for the reasons set out below which describe the operational noise related implication of the change to the opening year. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | based on assessment of noise effects. The date-related assumptions set out for the noise assessment, apply to the information used in the marine biodiversity assessment. | |
| Geology and soil – construction | The geology and soils baseline was established through third party data collection and field surveys that were undertaken at multiple stages of the Project development from 2017 until summer 2022. The geology and soils assessment presented in 6.1 Environmental Statement - Chapter 10 - Geology and Soils [**APP-148**] is based on preliminary works starting in 2024, the main construction activities starting in 2025 and ending in 2030. | The extended time from the baseline used to undertake the assessment on land quality may lead to some uncertainties in the land contamination status at the commencement of construction. For example new sources of contamination arise or deteriorating ground conditions, albeit this is considered a low risk considering the timeframe and not considered to significantly change the conclusions of the DCO application assessment. To address this risk a number of measures are identified in Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan (Version 2.0) (Tracked and Clean) [**REP1-156** and **REP1-157**], to manage potential areas of contamination including REAC references GS001, GS002, GS026, GS016, GS027 and GS028.<br>The baseline data used for the assessment of effects on soils remains valid as assessments of effects on agricultural land are based on soil physical properties and these are unlikely to change materially in this timeframe. Poor land management could increase compaction/reduce drainage, but in this timeframe these would be reversible.<br>REAC commitment GS010 in 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan (Version 2.0) (Tracked and Clean) [**REP1-156** and **REP1-157**] sets out proposals for detailed pre-construction soil surveys to be carried out. These surveys would ensure the information is available to support the development of a Soil Management Plan (SMP). This would not change the assessment outcome but would ensure a more robust and complete SMP can be developed prior to construction to ensure the most sustainable handling of soils throughout the construction phase. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | | It is not anticipated that there would be a material change to the significance of construction effects for geology and soils reported in the ES. |
| Geology and soil – operation | No date related assumptions are used within the operation phase assessment presented in 6.1 Environmental Statement - Chapter 10 - Geology and Soils [APP-148]. | There are no anticipated implications arising from the change of opening year. The operational phase assessment for geology and soils receptors is not dependent on the opening year.<br>Impacts to soils are predominantly realised during the construction phase, therefore, a change in opening year would not introduce new effects. It is not anticipated that there would be a material change to the significance of operational effects on geology and soils reported in the ES. |
| Material assets and waste – construction | The material assets and waste baseline was established through data collection and was undertaken at multiple stages of the Project development from 2017 until summer 2022. Based on the data available for landfill capacity, the assessment presented in 6.1 Environmental Statement - Chapter 11 - Material Assets and Waste [APP-149] used a future baseline year of 2025.<br>The assessment on material assets is not influenced by construction start and end dates. | Table 11.8 of ES Chapter 11 Material Assets and Waste [APP-149] presents the future baseline for landfill capacity between 2020 and 2030. The waste assessment selected 2025 as the future baseline year as this represented the worst-case scenario in terms of available landfill capacity within the study during the construction phase. A two year change to the start of the construction phase would result in the 2025 future baseline year used in the assessments presented in the DCO application becoming an underestimate of available landfill capacity in the study area. This would have no implications to the reporting of significance of effects on waste receptors reported in Chapter 11 as this continues to reflect a reasonable worst-case. The difference in future baseline capacity is not large enough to change the reported significance, whilst Project waste forecasts would remain in line with those presented in the DCO application.<br>There would be no change in material demand for the Project and the assessment of material assets is not time sensitive, therefore there would be no material change to the significance of effects reported in the ES.<br>It is not anticipated that there would be a material change to the significance of construction effects for material assets and waste reported in the ES. |
| Material assets and waste – operation | The first 12 months of operation was used as a representative year for forecasting material demand and waste generation. | There are no implications for the change of opening date to the operational assessment of material assets and waste. DMRB LA 110 Material assets and waste (Highways England, 2019) specifies that the environmental assessment should report on the first 12 months of operation to forecast material demand |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | This was irrespective of the date of the opening year. | and waste generation. This is not specific to any one year. The change to opening year would not result in a change to the forecast of material demand or waste generation.<br>It is not anticipated that there would be a material change to the significance of operational effects for material assets and waste reported in the ES. |
| Noise and vibration – construction | ***Off site construction traffic noise:*** The off site (existing road) construction traffic assessment is based upon traffic data for years 2025 to 2030. The construction traffic noise assessment used outputs from the traffic modelling. The construction traffic modelling presented in the DCO application assumes construction takes place between 2025 and 2030. The base year for background traffic levels used in the construction traffic modelling is 2030 which reflects a reasonable worst-case.<br>***On site construction noise and vibration:*** The assessment of noise and vibration effects of site based construction activities (all activities other than construction traffic) is not specifically linked to any base date. | ***Off site construction traffic noise:*** A change in construction period to 2027 until 2032, would mean existing flows on the network would likely increase as a result of year on year traffic growth, however the construction generated traffic would remain consistent with that reported previously. As the construction traffic dataset is derived from the 2030 base year, this represents a mid-point during the construction period and is therefore still considered to reflect a robust assessment scenario. The delay to the construction programme is unlikely to materially change the conclusions of the noise assessment.<br>***On site construction noise and vibration:*** As the construction programme is assumed to be moved by two years with no changes to programme and phasing of individual work elements it is not anticipated that there would be significant changes to the noise and vibration effects reported in the DCO application. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| Noise and vibration – operation | The noise assessment is based upon an opening year of 2030 and a future assessment year of 2045. This is based on the Project's transport modelling for these years which provides the traffic data supporting the operational road traffic noise.<br>Other elements of the operational assessment; tunnel ventilation and overhead lines are not related to a specific assessment year. | The change in opening year from 2030 to 2032, means that the operational road traffic noise assessment reflects a baseline of lower traffic levels. The assessment of noise impact requires a comparison between the DM and DS scenarios, therefore the effect of the two year delay to opening year would apply equally to both scenarios. It is anticipated that the magnitude of change between these scenarios would remain constant meaning it is unlikely to materially change the conclusions of the ES.<br>There would be no change to assessment conclusions for other elements of the operational assessment as these are not date related. |
| Population and human health – construction | Baseline data was collected for the assessment from 2017 until summer 2022. 6.1 Environmental Statement - Chapter 13 – Population and Human Health [**APP-151**] also considers future baseline i.e. anticipated changes to the existing baseline over time in the absence of the Project.<br>Elements of the population and human health assessment are based on assessment of effects for air quality and noise. The date-related assumptions set out for those topics, such as those related to traffic data, also apply to the information used in | The construction traffic forecasts transition from the worst-case, where baseline traffic levels reflect the final year of construction to a case where baseline traffic forecasts reflects a period in the middle of the construction programme. As set out in the rows in this table for air quality and noise during construction, it is not anticipated that this would result in materially different effects to those reported in the ES and the assessment continues to reflect a robust assessment scenario.<br>There would be no additional impacts to those already reported in the ES in relation to the acquisition of land and associated impacts on community land and assets, agricultural landholdings or on development land and businesses.<br>Delay of the Project for a further two years may have an adverse effect on the mental wellbeing of vulnerable populations in terms of ongoing anxiety and uncertainty; however this is balanced by potential job creation and skills development resulting from enabling works that would take place. This does not change what was reported in the assessment submitted as part of the DCO application, as uncertainty over construction dates was considered as part of the assessment. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | the population and human health assessment. | Overall, it is not anticipated that there would be a material change to the population and human health effects reported in the ES. |
| Population and human health – operation | 6.1 Environmental Statement - Chapter 13 – Population and Human Health [APP-151] assumes preliminary works starting in 2024, the main construction activities starting in 2025 and ending in 2030 with the operational phase starting in 2030 (full year modelled).<br>As for the construction phase, elements of the population and human health assessment are based on assessment of effects for air quality and noise effects. The date-related assumptions set out for those topics, such as those related to traffic data, also apply to the information used in the population and human health assessment. | Findings from the air quality and noise assessments indicate that the two year delay would not materially change the significance of operational effects to those reported in the ES. As identified in the relevant rows of this table, there would not be any additional implications to those reported in the ES in relation to other topics that form part of the population and human health assessment.<br>Overall, it is not anticipated that there would be a material change to the population and human health effects reported in the ES. |
| Road drainage and the water environment – construction | The construction phase assessments presented in 6.1 Environmental Statement - Chapter 14 - Road Drainage and the Water Environment [APP-152] and the modelling work which supports this are | The road drainage and water environment assessment of construction phase effects is not sensitive to a change to the construction years (2027 – 2032), and there would be no material change to the road drainage and water environment effects reported in the ES. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | not dependent on date related assumptions.<br>The Project is committed to monitoring groundwater levels at key locations during the pre-construction period, as set out in the REAC within 6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan (Version 2.0) (Tracked and Clean) [**REP1-156** and **REP1-157**]. This monitoring would inform the detailed design. | |
| Road drainage and the water environment – operation | The surface and groundwater drainage pollution risk assessments presented in 6.1 Environmental Statement - Chapter 14 - Road Drainage and the Water Environment [**APP-152**] use traffic modelling data for the design year of 2045 (opening year plus 15) in line with DMRB guidance.<br>The Flood Risk Assessment 6.3 Environmental Statement - Appendix 14.6 - Flood Risk Assessment – Parts 1 to 10 [**APP-460** to **APP-464**, **REP1-170** and **REP1-171** and **APP-** | It is not anticipated that the extra traffic growth in the opening year (and therefore the design year) would change the conclusions of the pollution risks assessment presented in the ES, or warrant any new recommendations with regards to treatment measures.<br>The extension in the road opening date to the end of 2032 would add a very small additional increment to the climate change allowances applied to fluvial and tidal flood levels assessed in the Flood Risk Assessment [**APP-460** to **APP-464**, **REP1-170** and **REP1-171** and **APP-466** to **APP-478** (referenced in order of Parts)]. However, given the resilience and freeboard built into the design (e.g. flood protection of the north portal, provision for flood compensation), it is not considered that this small increment would have any significant implications.<br>The Project design embeds robust measures for providing treatment of road drainage and for flood protection and mitigation. The road drainage and water environment assessment of operational phase effects is therefore considered to have low sensitivity to a change to the construction years (2027 – 2032) and subsequent operational design year and lifetime. Overall, it is not anticipated |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | 466 to APP-478 (referenced in order of Parts)] is based on an opening year of 2030, with climate change allowances applied over the Project's 100yr lifetime from this date i.e. to 2130. | that there would be a material change in the significance of road drainage and water environment effects reported for the construction phase in the ES. |
| Climate / Greenhouse gas (GHG) emissions – construction & operation | The assessment presented in 6.1 Environmental Statement - Chapter 15 – Climate [APP-153] assumes that construction starts in 2025 (2024 for preliminary works) and ends in 2030.<br>It is assumed that the operation phase starts in 2030 (full year modelled). | In ES Chapter 15 [APP-153], an assessment of the Project's GHG emissions is undertaken against the UK Government's five-year carbon budgets, as required by the National Policy Statement for National Networks. A two-year delay of the start of the construction period would lead to a decrease in the Project's GHG emissions in the fourth (2023-2027) carbon budget and an increase in the proportion of the Project's emissions in the fifth (2028-2032) carbon budget. The two-year re-phase would also result in the removal of two-years of operational phase emissions, which includes emissions from road users, maintenance and repair, from the fifth carbon budget. This would lead to a change in the percentage contribution to these carbon budgets compared to those presented in Table 15.17 of Chapter 15 of the ES [APP-153], which is also presented in Table D1.1 of Annex D1 to allow comparison. The Project's contribution to the sixth carbon budget would not change and overall the Project's total emissions would not change.<br>In relation to road user GHG emissions, three scenarios were presented in Table 15.17 of the ES to give a range of credible outcomes for the impact assessment. These are described in full in paragraphs 15.3.37-15.3.41 of ES Chapter 15 [APP-153] and include a conservative scenario using the current Transport Appraisal Guidance (TAG) and Emission Factor Toolkit (EFT) v11 and two further scenarios which present an upper and lower bound of the Transport Decarbonisation Plan (TDP) (DfT, 2021) implementation and its likely impact on vehicle emissions.<br>Based on a construction period (including preliminary works) from 2026-2032 and using the forecast emissions profile (which is in line with the spend profile for the Project), re-phasing the construction by two years would result in the |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | | movement of approximately 710,000 tCO2e construction phase emissions from the fourth carbon budget period (2023 to 2027) to the fifth carbon budget period (2028 to 2032).<br>Under the TAG EFTv11 scenario, the change of opening year to 2032 would also lead to the removal of approximately 190,000 tCO2e from the fifth carbon budget, which is equal to the estimated operational phase emissions for 2030 and 2031 presented in ES Chapter 15 [**APP-153**]. The net difference in GHG emissions in the fifth carbon budget, based on the two-year re-phase, is approximately 515,000 $tCO_2e$. The results of this change are presented in Table D1.2 (Annex D1), including the two TDP scenarios.<br>Under the more conservative TAG EFTv11 scenario, the Project's contribution to the fifth carbon budget would increase by 0.03% from 0.053% to approximately 0.082%. Consequently, there would be a corresponding reduction in the Project's contribution to the fourth carbon budget which would reduce from 0.058% to around 0.023%.<br>Table D1.2 (Annex D1) shows that the two TDP scenarios would result in a reduced contribution in the fifth carbon budget when compared to the TAG EFTv11 derived calculation. The contribution would reduce to 0.081% for the upper bound and 0.080% for the lower bound. In line with Table D1.1 (Annex D1), the benefits of the TDP upper and lower bound are greater during the sixth carbon budget.<br>It should be noted that the two-year delay to the start of construction also provides further opportunities for additional reductions in emissions. The industry leading framework for carbon management and continuous improvement set out in the Carbon and Energy Management Plan [**APP-552**] and secured through the 22 carbon commitments presented in Appendix E of the Carbon and Energy Management Plan provides a strong mechanism for driving and learning from evolving best practice, delivering emissions savings throughout detailed design and construction. |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | | Overall, it is not anticipated that there would be a material change in the significance of effects on climate / GHG emissions as reported in the ES as a result of the two-year rephasing of construction. |
| Climate / resilience – construction & operation | The assessment presented in 6.1 Environmental Statement - Chapter 15 – Climate [APP-153] assumes that construction starts in 2025 (2024 for preliminary works) and ends in 2030.<br>It is assumed that the operation phase starts in 2030 (full year modelled). | The delay in the start of the construction of the Project would not change the assessment or the outcome of the assessment. The extension in the road opening date to the end of 2032 would add a very small additional increment to the climate change allowances applied to fluvial and tidal flood levels assessed in the Flood Risk Assessment. However, given the resilience and freeboard built into the design (e.g. flood protection of the north portal, provision for flood compensation), it is not considered that this small increment would have any significant implications.<br>The assessment of the Project's vulnerability to climate change for the operation phase has been based on a reasonable worst-case using the latest upper projections (RCP8.5) from UKCP18. ES Chapter 15 (Application Document APP-153) and ES Appendix 15.3 (Application Documents APP-482) demonstrates that the Project design is resilient to future climate change.<br>Overall, it is not anticipated that there would be a material change in the significance of effects on climate and resilience as reported in the ES. |
| Cumulative Effects Assessment – construction and operation | The assessments presented in 6.1 Environmental Statement - Chapter 16 - Cumulative Effects Assessment [APP-154] assume start of construction in 2025 with completion of construction and road opening in 2030.<br>Further date related assumptions for individual topics feeding into the cumulative assessment are as set out above. | **Inter-project effects**<br>Some of the developments that have been included in the inter-project effects assessment would have completed their construction phase prior to the revised start date for construction of the Project. The assessment of overlapping construction phases would still represent an assessment of the reasonable worst-case.<br>A two year delay to the start of construction would mean that additional developments within the inter-project effects search area are likely to come forward, and additional and more detailed information may be made available for those already identified. Local Plans that are currently in development may also be finalised, with the associated site allocation information made available. This may result in additional cumulative inter-project effects; however it is only possible to identify these effects where there is available information on these |

| Environmental topic | Date related influences on environmental assessments | Implications of the change to construction start date and revised opening year |
|---|---|---|
| | | developments. An update to the assessment of inter-project effects from new and updated developments up until a revised cut-off date of the end of February 2023 has been undertaken and was reported in Appendix B of 9.8 ES Addendum [**REP1-181**]. The environmental effects identified in Appendix B are not a direct consequence of the effects of the two-year delay, but as a result of newly available information. It should be noted that developments that were not considered in the cumulative inter-project effects assessment presented in the DCO application because they were not known about, or where only limited information was available, would be required to consider the Project as part of their own cumulative inter-project effects assessment.<br>**Intra-project effects**<br>As reported in the rows above, no material changes to the assessment conclusions for the environmental topic chapters have been identified. It is therefore not anticipated that there would be material change to the assessments reported in 6.1 Environmental Statement - Chapter 16 - Cumulative Effects Assessment [**APP-154**].<br>The intra-project effects assessment of effects on people is based primarily on the information from the air quality, visual, noise and population and human heath assessments. Implications from the change in construction dates and opening year on the conclusions of these assessment could have resulting impacts on the conclusions of the intra-project effects assessment, however no material change has been identified for any of these topics. It is therefore anticipated that there would be no material change to the conclusions of the intra-project effects assessment presented in ES Chapter 16. |

D.4.3 In conclusion, the appraisal has confirmed the Applicant's position that the ES as submitted, reflects a worst-case scenario and accommodates a proportionate degree for flexibility around the timing of construction, which would allow for the two-year rephasing of construction. The Applicant considers that the ES provides conclusions that remain robust for the purpose of making a decision on the Project, despite a change to the dates for construction and opening of the road to traffic.

## D.5 In combination effects with the Thames Freeport development

D.5.1 Action Point 1 from ISH1 [**EV-023a**] on 21 June 2023 related to the two-year rephasing included the following requirement: "…*This should include consideration of the time sequence for and outcome of committed elements of Freeport development which it has been suggested will now be delivered concurrently with aspects of the rephased LTC project.*"

D.5.2 A review has been undertaken from available information on the committed elements of the Freeport development. There is currently no publicly available information for the Freeport development, such as a planning application, masterplan or similar document, that would support an appraisal of effects at the level of detail requested by the Action Point.

D.5.3 The Freeport development has been included in the inter-project effects assessment presented in 6.1 Environmental Statement - Chapter 16 - Cumulative Effects Assessment [**APP-154**] and 6.3 Environmental Statement - Appendix 16.2 - Short List of Developments [**APP-484**]. The assessment was based on the limited information available on the proposed development, which includes information provided by Thurrock Council as a Local Plan projection.

D.5.4 The Freeport development is not included in the operational or construction transport models for the Project. While information has been supplied to National Highways on the anticipated traffic flows, no information has been provided on anticipated mitigation proposals on the highway network that would be required to support the proposals. Further information on the consideration of traffic associated with the Thames Freeport is contained within Annex E.9 of 9.10 Post-event submissions, including written submission of oral comments for ISH1 [**REP1-182**].

D.5.5 Without further information no additional conclusions can be drawn beyond those presented in the inter-project effects assessment in 6.1 Environmental Statement - Chapter 16 - Cumulative Effects Assessment [**APP-154**] and 6.3 Environmental Statement - Appendix 16.2 - Short List of Developments [**APP-484**].

D.5.6 It is assumed that appropriate consents would be obtained for the Freeport development and any environmental assessments would include a cumulative assessment in combination with the Project. It is assumed that appropriate mitigation measures for adverse effects would be proposed as part of these consent applications and associated environmental assessments. In the event that works are undertaken as part of the Freeport development using any permitted development rights, it is assumed that these would not result in significant environmental effects.

D.5.7 Dialogue is ongoing between the two projects and the position at the time of the DCO application is set out in 7.17 Interrelationship with other Nationally Significant Infrastructure Projects and Major Development Schemes [**APP-550**]. This dialogue will continue throughout the DCO Examination, detailed design and construction phases, as set out in the 7.17 Interrelationship with other Nationally Significant Infrastructure Projects and Major Development Schemes [**APP-550**].

# Annex D1 Greenhouse gas emissions

D1.1.1 Additional information to support the text included in Appendix D Table D.2 on greenhouse gas emissions compared to relevant carbon budgets is provided in Table D1.1 and Table D1.2 . Table D1.1 provides a replica of Table 15.17 of ES Chapter 15 Climate [APP-153] for comparison purposes. Table D1.2 shows the modelled construction and operational phase emissions compared to relevant carbon budgets following the two-year delay to the start of construction and opening year.

**Table D1.1 Modelled construction and operational phase emissions compared to relevant carbon budgets as presented in Table 15.17 of ES Chapter 15 Climate [APP- 153]**

| Project phase | Modelled total GHG emissions over relevant carbon budgets ($tCO_2e$) (DS* scenario) | Net Project GHG emissions over relevant carbon budgets ($tCO_2e$) (DS*- DM*) | Net Project GHG emissions per relevant carbon budget ($tCO_2e$)** | | |
|---|---|---|---|---|---|
| | | | Fourth (2023 to 2027) | Fifth (2028 to 2032) | Sixth (2033 to 2037) |
| Construction | 1,762,967 | 1,762,967 | 1,148,319 | 614,648 | N/A |
| **TAG GHG workbook / EFT v11*** with operation and maintenance** | | | | | |
| Operation | 76,122,688 | 746,624 | N/A | 284,451 | 462,173 |
| Total | 77,885,655 | 2,509,726 | 1,148,319 | 899,099 | 462,173 |
| **Percentage contribution to carbon budget** | | | **0.058%** | **0.053%** | **0.048%** |
| **Transport Decarbonisation Plan upper bound estimate with operation and maintenance** | | | | | |
| Operation | 52,512,613 | 579,934 | N/A | 254,700 | 325,234 |
| Total | 54,275,580 | 2,342,902 | 1,148,319 | 869,348 | 325,234 |
| **Percentage contribution to carbon budget** | | | **0.058%** | **0.051%** | **0.034%** |
| **Transport Decarbonisation Plan lower bound estimate with operation and maintenance** | | | | | |
| Operation | 30,281,202 | 346,082 | N/A | 167,476 | 178,607 |
| Total | 32,044,169 | 2,109,049 | 1,148,319 | 782,123 | 178,607 |
| **Percentage contribution to carbon budget** | | | **0.058%** | **0.046%** | **0.019%** |

* DM = Do Minimum scenario; DS = Do Something scenario

** The presented numbers are the result of model calculations. They should still be considered as estimates, however.

*** TAG GHG Workbook (DfT, 2022a) and EFT v11 (Defra, 2021)

**Table D1.2 Modelled construction and operational phase emissions compared to relevant carbon budgets following two-year delay to start of construction and opening year**

| Project phase | Modelled total GHG emissions over relevant carbon budgets ($tCO_2e$) (DS* scenario) | Net Project GHG emissions over relevant carbon budgets ($tCO_2e$) (DS*- DM*) | Net Project GHG emissions per relevant carbon budget ($tCO_2e$)** | | |
|---|---|---|---|---|---|
| | | | Fourth (2023 to 2027) | Fifth (2028 to 2032) | Sixth (2033 to 2037) |
| Construction | 1,762,967 | 1,762,967 | 440,234 | 1,322,733 | 0 |
| **TAG GHG workbook / EFT v11 with operation and maintenance** | | | | | |
| Operation | 50,344,740 | 556,392 | 0 | 94,219 | 462,173 |
| Total | 52,107,707 | 2,319,360 | 440,234 | 1,416,952 | 462,173 |
| **Percentage contribution to carbon budget** | | | **0.023%** | **0.082%** | **0.048%** |
| **Transport Decarbonisation Plan upper bound estimate with operation and maintenance** | | | | | |
| Operation | 36,202,253 | 405,583 | 0 | 80,349 | 325,234 |
| Total | 37,965,220 | 2,168,550 | 440,234 | 1,403,082 | 325,234 |
| **Percentage contribution to carbon budget** | | | **0.023%** | **0.081%** | **0.034%** |
| **Transport Decarbonisation Plan lower bound estimate with operation and maintenance** | | | | | |
| Operation | 19,572,899 | 229,163 | 0 | 50,557 | 178,607 |
| Total | 21,335,866 | 1,992,130 | 440,234 | 1,373,290 | 178,607 |
| **Percentage contribution to carbon budget** | | | **0.023%** | **0.080%** | **0.019%** |

* DM = Do Minimum scenario; DS = Do Something scenario

** The presented numbers are the result of model calculations. They should still be considered as estimates, however.

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