national highways

Lower Thames Crossing

5.4.1.6 Draft Agreed Statement of Common Ground between (1) National Highways and (2) Natural England (Clean version)

APFP Regulation 5(2)(q)

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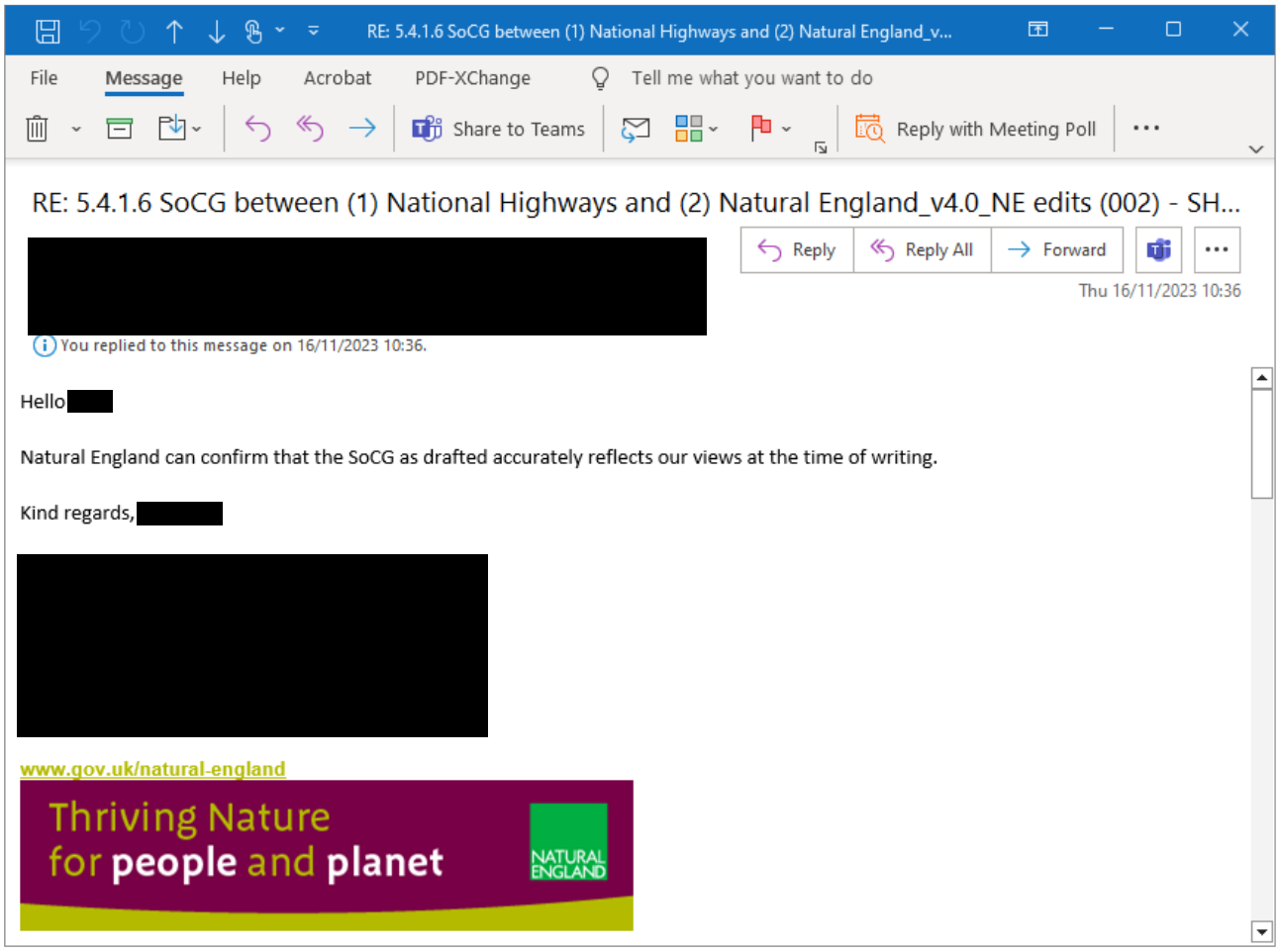
Revision history

Version	Date	Submitted at
1.0	31 October 2022	DCO Application
2.0	3 August 2023	Deadline 2
3.0	3 October 2023	Deadline 5
4.0	17 November 2023	Deadline 7

Status of the Statement of Common Ground

This is an Agreed Draft Statement of Common Ground with matters outstanding.

National Highways and Natural England agree that this draft Statement of Common Ground (SoCG) is an accurate description of the matters raised and the current status of each matter.



A high-level overview of the engagement undertaken since the DCO application was submitted on 31 October 2022 is summarised in Table A.1 in Appendix A.

Lower Thames Crossing

5.4.1.6 Draft Agreed Statement of Common Ground between (1) National Highways and (2) Natural England (Clean version)

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1 Introduction

1.1 Purpose of the Statement of Common Ground

1.1.1 This Statement of Common Ground (SoCG) has been prepared in respect of the Development Consent Order (DCO) application for the proposed A122 Lower Thames Crossing (the Project) made by National Highways Limited (the Applicant) to the Secretary of State for Transport (Secretary of State) under section 37 of the Planning Act 2008 on 31 October 2022.

1.1.2 The SoCG has been produced to confirm to the Examining Authority where agreement has been reached between the Applicant and Natural England, and where agreement has not been reached. Where matters are yet to be agreed, the parties will continue to work proactively to reach agreement and will update the SoCG to reflect areas of further agreement.

1.1.3 This version of the SoCG has been submitted at Examination Deadline 7.

1.2 Principal Areas of Disagreement

1.2.1 On 19 December 2022 the Examination Authority made some early procedural decisions to assist the Applicant, potential Interested Parties and themselves to prepare for the Examination of the Application.

1.2.2 One of these procedural decisions was to use a tracker recording Principal Areas of Disagreement in Summary (PADS).

1.2.3 The PADS Tracker would provide a record of those principal matters of disagreement emerging from the SoCG and should be updated alongside the SoCG as appropriate throughout the Examination with the expectation that a revised PADS Tracker should be submitted at every Examination deadline.

1.2.4 Natural England elected not to produce a PADS Tracker, at pre-examination stage, indicating to the Applicant that they were content that the number of outstanding matters within the SoCG was insufficient to warrant the exercise.

1.3 Terminology

1.3.1 In the matters table in Section 2 of this SoCG, “Matter not agreed” indicates agreement on the matter could not be reached following significant engagement, and “Matter under discussion” where these points will be the subject of ongoing discussion wherever possible to resolve, or refine, the extent of disagreement between the parties. “Matter agreed” indicates where the issue has now been resolved.

2 Matters

2.1 Movement of outstanding matters

2.1.1 Following submission of the previous version of this Draft Statement of Common Ground (SoCG) between the Applicant and Natural England, further discussions on the outstanding matters have taken place. These discussions are summarised in Table A.1 in Appendix A and the outcome of these discussions is summarised below.

2.1.2 It is acknowledged there are some matters where further discussion may take place during the detailed design stage of the Project to finalise detail, but the matter is agreed in principle. Matters to which this applies have an asterisk (*) next to them.

2.1.3 In the column 'Item No' in Table 2.1, 'Rule 6' indicates a matter entered in the SoCG as a result of a request in the Rule 6 letter, 'RRN' indicates a matter entered into the SoCG as a result of content in the Relevant Representation, 'RRE' indicates an existing SoCG matter that was also raised in the Relevant Representation, 'WR' indicates a matter entered into the SoCG as a result of content in the 'Written Representation' and 'DLX' indicates a new matter added during examination at/around that deadline.

2.1.4 The following matters have moved from 'matter under discussion' to 'matter agreed':

a. Item 2.1.32 'Landscape and Visual', 'Tranquillity'

b. Item 2.1.49 'Terrestrial Biodiversity', 'Invertebrate baseline data'

c. Item 2.1.54 'Terrestrial Biodiversity', 'Invertebrate mitigation'

2.1.5 The following matters have moved from 'matter under discussion' to 'matter not agreed':

a. Item 2.1.105 'Landscape and Visual', 'Visual Baseline'

b. Item 2.1.27 'Landscape and Visual', 'Impacts'

c. Item 2.1.28 'Landscape and Visual', 'Impacts'

d. Item 2.1.36 'Landscape and Visual', 'Green Bridges'

e. Item 2.1.37 'Landscape and Visual', 'Green Bridges'

f. Item 2.1.109 'Landscape and Visual', 'Mitigation'

g. Item 2.1.89 'HRA Screening'

2.1.6 Table 2.1 details and presents the matters which have been agreed, not agreed, or are under discussion between (1) the Applicant and (2) Natural England.

2.1.7 In Table 2.1, relevant issues relating to the dDCO articles and Requirements in Schedule 2 to the dDCO have been identified under the heading 'DCO and Consents'.

2.1.8 At Examination Deadline 5 there were 109 matters in total of which 67 were agreed, 10 were not agreed and 32 remained under discussion.

2.1.9 At Examination Deadline 7 there are 109 matters in total of which 70 are agreed, 19 are not agreed and 21 remain under discussion.

Table 2.1 Matters

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
DCO and Consents					
Securing Mechanisms	2.1.1	The agreement for Natural England to be a consultee under Schedule 2, Requirement 4 of the draft Development Consent Order (DCO) (relating to the second iteration of the Environmental Management Plan (EMP 2)) and Requirement 5 (landscaping) is welcomed.	Natural England will have a consultation role under Schedule 2, Requirement 4 of the draft DCO (relating to EMP 2). The Contractors responsible for the delivery of the Project will therefore consult Natural England on all matters related to their function in the EMP 2. Natural England will also be consulted on Schedule 2, Requirement 5 of the draft DCO (landscape).	Draft Development Consent Order [REP6-010]	Matter Agreed
Securing Mechanisms	2.1.2 RRE	Natural England welcomes and agrees to the approach of an outline Landscape and Ecology Management Plan (oLEMP) advisory group. Natural England provided comments and	An oLEMP advisory group will be set up to help inform decision making throughout the duration of the Landscape and Ecology Management Plan (LEMP). The remit of the advisory group will be to discuss the	Outline Landscape and Ecology Management Plan [REP4-140]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		feedback on the pre-application draft terms of reference of the Advisory Group. Natural England has outstanding concerns regarding the role and governance of the oLEMP Advisory Group. These concerns are detailed within our Written Representation (REP1-262) and relate primarily to the dispute resolution measures and the burden of the ask on Advisory Group members. Natural England would expect the Applicant to allow cost recovery agreements for non-statutory advice to continue during the post consent period, for attendance at the oLEMP Advisory Group. The Applicant has confirmed that they will provide a cost recovery agreement which is secured in the Stakeholder Actions and Commitments Register, which Natural England welcomes.	implementation of the LEMP, to review the monitoring process and to agree changes to the LEMP (and/or its prescribed management activities) when they are required, or when successful achievements of targets have been met. Natural England has received and commented on the draft terms of reference for the group. The Applicant has taken account of these matters in the DCO application version of the document. Natural England expressed concern in their Relevant Representation response regarding the role and governance of the group, and the Applicant awaits additional information on the nature of these concerns which will inform ongoing engagement on this matter. The Applicant has confirmed that it will provide a cost-recovery agreement for Natural England's non-statutory advice and has included this in the Stakeholder Actions and Commitments Register at Deadline 7.	Natural England's Written Representation paragraphs 3.1.15 – 3.1.18 and 3.1.23 [**REP1-262**] Stakeholder Actions and Commitments Register [**REP6-050**]	
Securing Mechanisms	2.1.3	Natural England does not agree with the disapplication of its powers under Sections 28E and H of the Wildlife and Countryside Act (WCA) 1981. Natural England's concern is that significant detail on	The Applicant is seeking to disapply Sections 28E and 28H of the WCA 1981 as part of the Project's draft DCO. The Applicant has shared a legal note which applies to both the Lower Thames	Draft Development Consent Order [**REP6-010**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		operations that may have direct or indirect impacts on SSSIs may be deferred to the post-consent stage. Natural England's position is that its responsibilities under the Wildlife and Countryside Act should only ever be disapplied in exceptional circumstances. Natural England received the Applicant's 'Legal note on the disapplication of SS.28E and 28H of the WCA 1991' which applies to both the Lower Thames Crossing and the A417 'Missing Link'. Natural England provided its response to this legal note on 14/02/2022 in its Deadline 4 submission for the A417 Missing link NSIP. This is Natural England's advice with regards to the matters contained in the Applicant's legal note, so should also be taken as Natural England's position in response to this note with regard to its relevance to the LTC scheme.	Crossing and the A417 'Legal note on the disapplication of SS.28E and 28H of the WCA 1991'. This explains why the Applicant considers the disapplication of these provisions is appropriate and justified. The Applicant notes that a provision seeking to disapply sections 28E and 28H of the 1981 Act was removed from the A417 Missing Link Development Consent Order by the Secretary of State, at the Examining Authority's recommendation. In the Examining Authority's view in that case, the removal was necessary '*…in order to protect potential SSSI land within the Order Limits*' (paragraph 9.4.15 of the Examining Authority's recommendation report). In the Applicant's view, the development of NSIPs should not be frustrated or delayed by potential SSSI designations over land for which development consent has been granted. Furthermore, the disapplication contained in the A417 Order and the Project's draft DCO is intended to apply to existing SSSIs, as it is to potential SSSIs. The necessary consequence of the decision in respect of the A417 Order is therefore that sections 28E and 28H of the 1981 Act continue to apply to operations in, over or under land subject		

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			to an existing SSSI designation. The Applicant does not consider that this is an appropriate outcome, given that the proposed operations affecting SSSI land are well understood, subject to appropriate mitigation and Natural England and other interested parties will have had extensive opportunity to comment on these matters during the course of the Examination process. The Applicant notes and accepts that a statutory defence of 'reasonable excuse' may be available in relation to operations carried out within SSSI land where sections 28E and 28H have not been complied with, which would otherwise amount to an offence. Natural England also expressed that view in the context of the A417 Scheme. However, the Applicant considers that it is clearly preferable for the draft DCO to disapply these provisions rather than require the application of the statutory defence to be considered on a case by case basis, thus failing to provide legal certainty. Notwithstanding the decision on the A417 Scheme, the Applicant therefore remains of the view that it is appropriate for the draft DCO to seek to disapply sections 28E and 28H of the 1981 Act.		

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Securing mechanisms	2.1.102 (DL2) RRN	Natural England is concerned that a number of the securing mechanisms within the full suite of Control Documents (i.e. the draft DCO, HRA, Environmental Statement, the CoCP, the oLEMP and Design Principles) for necessary mitigation measures do not provide a sufficient degree of certainty in relation to their delivery at present. In addition, there are a number of caveats throughout the application detailing that key mitigation measures will be delivered 'where reasonably practicable', for example. This combined with a significant amount of detail on the mitigation and compensation measures being deferred to the detailed design stage provides a degree of uncertainty that the mitigation and compensation measures will be delivered and achieve their aims. During a meeting with Natural England on the 31 August 2023, the Applicant confirmed that they would revisit the wording of the commitments within the various control documents to try and address our concerns and to make them clearer. Unfortunately, no such updates appear to have been provided to date. The Applicant's amendments to oLEMP and Stakeholder Actions and Commitments Register are acknowledged	The draft DCO states that the authorised development must be designed in detail and carried out in accordance with the Design Principles and the preliminary scheme design, unless otherwise agreed in writing. The wording maintains a degree of flexibility for the detailed design to respond to practical design considerations. However, the Design Principles would ensure that the underlying requirements of each principle are met, subject to any practical limitations that could not be reasonably overcome. As detailed in its Comments on Written Representations Appendix A [**REP2-046**], the Applicant committed to consider Natural England's proposed updated wording of commitments. The Applicant has considered and implemented several of Natural England's suggested updates to securing mechanisms, for example their requested additions to the oLEMP, as detailed in SoCG items 2.1.21, 2.1.41, 2.1.93 and 2.1.104 and the update to the Stakeholder Actions and Commitments Register detailed in item 2.1.2. The Applicant has also updated the oLEMP to commit to in-perpetuity management of mitigation and compensation	Draft Development Consent Order [**REP6-010**] Design Principles [**REP6-046**] Natural England's Written Representation paragraphs 6.1.53, 6.1.55 and 8.1.4 [**REP1-262**] Comments on Written Representations Appendix A [**REP2-046**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		and welcomed but Natural England remains concerned that control documents still contain a significant number of ambiguous statements (such as 'where reasonably practicable' which do not provide Natural England with sufficient certainty that the landscape and ecological mitigation will be effective.	measures as requested by Natural England.		
Coordinating parallel consents and other AA	2.1.4 RRE	Natural England considers that the consultation on the mitigation requirements and the permitting of them has been constructive, and that the proposed mitigation is feasible, subject to the Environment Agency concluding that it is likely that the permits will be authorised at the appropriate time to facilitate the effective implementation of the mitigation.	In accordance with the 2022 update of Planning Inspectorate Advice Note 10 (Habitats Regulations Assessment relevant to Nationally Significant Infrastructure Projects) Sections 5.3 to 5.6, the Applicant has consulted with Natural England and the Environment Agency with regard to the need for two Environment Agency permits in relation to mitigation measures proposed within the HRA, namely the discharge permit for the construction discharge from the southern tunnel entrance compound; and the provision of a water control structure in the sea defences at Coalhouse Point to facilitate wetland creation. Item 2.1.4 in the Applicant's SoCG with the Environment Agency, sets out the Environment Agency's position that it is likely that the permits would be authorised at the appropriate time.	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] SoCG between National Highways and the Environment Agency [**REP5-034**]	Matter Agreed*
Planning Statement/policy					

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Management Plan	2.1.5	Natural England has discussed with the Applicant the need to fully consider the principles, aims and objectives of the Kent Downs Area of Outstanding Natural Beauty (AONB) Unit Management Plan, as part of the duty placed on public bodies to have regard to the purpose of conserving and enhancing the natural beauty of an AONB. Natural England will continue to provide advice on this matter as part of its review of the ES.	The principles, aims and objectives of the Kent Downs AONB Unit, including their management plan for 2021-2026, have been reviewed as part of Environmental Statement (ES) Chapter 7: Landscape and Visual, and are detailed in ES Appendix 7.6: Kent Downs AONB Relevant Guidance.	ES Chapter 7: Landscape and Visual [**APP-145**] ES Appendix 7.6: Kent Downs AONB Relevant Guidance [**APP-381**]	Matter Agreed*
Management Plan	2.1.6	The Landscape ES Chapter Should be updated to refer to the 2021-2026 Management Plan for the Kent Downs AONB.	ES Chapter 7: Landscape and Visual has been updated to include reference to the updated Kent Downs AONB Unit Management Plan for 2021-2026.	ES Chapter 7: Landscape and Visual [**APP-145**]	Matter Agreed
Route selection, model alternatives and assessment of reasonable alternatives					
Route location	2.1.7	Natural England has raised significant concerns regarding the additional direct and indirect impacts to the Kent Downs AONB, Shorne and Ashenbank Woods SSSI, and ancient woodland that have resulted from the scheme amendments since the preferred route announcement by the Secretary of State. Natural England recognises that the impacts to SSSIs and ancient woodland have reduced as a result of its discussions with the Applicant , although significant impacts remain. Whilst Natural England	A robust and appropriate assessment of the route selection has been undertaken and is detailed in ES Chapter 3: Assessment of Reasonable Alternatives. A non-statutory public consultation was held in 2016 which included a detailed appraisal of the routes. Route 3 was progressed as it best met the Scheme Objectives and had the least environmental impact. A further assessment was undertaken in 2020 which assessed the balance of the environmental impacts of the Eastern	ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**] Planning Statement [**APP-495**] Natural England's Written Representation paragraphs	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		does not endorse the remaining impacts, it has held constructive discussions regarding mitigation and compensation measures that would be required if the scheme is granted consent. Natural England recognises that the Secretary of State needs to consider the project in terms of the tests set out in the NPSNN relating to impacts on SSSIs, ancient woodland, and Areas of Outstanding Natural Beauty.	Southern Link against the Western Southern Link, including an assessment of Landscape Character Areas and impacts to the AONB. The impacts of the Western Southern Link remain less significant than the overall balance of impacts of the Eastern Southern Link. Full details of the route selection process can be found in ES Chapter 3: Assessment of Reasonable Alternatives. Impacts on SSSIs and ancient woodland are assessed within the Planning Statement as it is a National Policy Statement for National Networks (NPSNN) test (paragraphs 5.28, 5.29, and 5.32). Impacts to SSSI and ancient woodland as a result of utilities works have significantly reduced since they were first presented to Natural England in summer 2019. It is the Applicant's view that the NPSNN test has been met, and that the benefits of the Project clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs.	5.1.1, 5.1.3 – 5.1.4, 5.1.10 – 5.1.12, 5.1.18 – 5.1.20, 6.1.1, 6.1.2, 8.1.1 – 8.1.3 [REP1-262]	

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Impacts	2.1.8 RRE	Natural England does not endorse the loss of and damage to ancient woodlands and SSSIs, which are afforded significant protection in planning policy (sections 5.28, 5.29, and 5.32 of the NPSNN). Following the preferred route announcement by the Secretary of State, the scheme amendments have increased the area of SSSI and ancient woodland that is to be impacted. Natural England recognises that the impacts to SSSIs and ancient woodland have reduced as a result of its discussions with the Applicant, although significant impacts remain. Whilst Natural England does not endorse the remaining impacts, it has held constructive discussions regarding mitigation and compensation measures that would be required if the scheme is granted consent. Natural England recognises that the Secretary of State needs to consider the project in terms of the tests set out in the NPSNN relating to impacts on SSSIs, ancient woodland, and Areas of Outstanding Natural Beauty.	Impacts on SSSIs and ancient woodland are assessed within the Planning Statement as it is a NPSNN test (paragraphs 5.28, 5.29, and 5.32). Impacts to SSSI and ancient woodland as a result of utilities works have significantly reduced since they were first presented to Natural England in summer 2019. As detailed in item 2.1.7, it is the Applicant's view that the NPSNN test has been met.	Planning Statement [**APP-495**] Natural England's Written Representation paragraphs 5.1.1, 5.1.3 – 5.1.4, 5.1.10 – 5.1.12, 5.1.18 – 5.1.20, 8.1.2, 8.1.3 [**REP1-262**]	Matter Not Agreed
Impacts	2.1.9 RRE	Natural England does not endorse the direct loss of and impacts to AONBs, which are afforded significant protection in	Mitigation for the landscape and visual impacts on the AONB is embedded in the design and reported in ES Chapter 7: Landscape and Visual, and is also	ES Chapter 7: Landscape and Visual [**APP-145**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		planning policy (sections 5.150 to 5.155 of the NPSNN). Whilst Natural England has had constructive discussions with the Applicant to identify measures that will help mitigate the impacts, it considers a significant adverse residual landscape and visual impact in relation to the AONB will remain at year 15. Natural England recommends that the ES is updated to detail how the residual impacts are to be reduced.	shown in the Environmental Masterplan. The residual effects, after allowing time for the establishment of planting mitigation, are summarised in ES Chapter 7: Landscape and Visual, and reported in ES Appendix 7.9: Schedule of Landscape Effects. Design refinements, including utilities updates, have resulted in a reduction in the reported significance of effect since December 2020. The effect in the design year (year 15) has reduced from a large adverse effect reported in December 2020, to a moderate adverse effect. As requested by Natural England, the Applicant shared draft landscape cross-sections through the M2/A2/A122 Lower Thames Crossing junction on 10 May 2023.	ES Figure 2.4: Environmental Masterplan [REP4-124, REP3-098, REP2-018, APP-162, REP4-127, REP4-129, REP2-024 to REP2-031] ES Appendix 7.9: Schedule of Landscape Effects [APP-384] Natural England's Written Representation paragraphs 6.1.1 and 6.1.2 [REP1-262]	
Location of South Portal	2.1.10	The relocation of the southern tunnel entrance approximately 350 metres south, further away from the South Thames Estuary and Marshes SSSI and the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar Site is welcomed.	The Applicant welcomes Natural England's support for this change.	N/A	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Land and compulsory acquisition					
Common land	2.1.11	Whilst Natural England has accepted that the Applicant does not intend to re-register land as common land following completion of works in this area, Natural England and the Applicant have agreed that Section 193 of the Law of Property Act 1925 (public access rights) will be applied to the fields to the west and east of the Lower Thames Crossing alignment in Orsett Fen (excluding the highway, maintenance access and drainage pond), following completion of the habitat mitigation works, which are for water vole mitigation and open mosaic habitat (known as Fen Land A and B). Natural England accepts that the DCO provision has been updated to reflect this.	In response to Natural England's request, the Applicant has included a draft DCO Provision (Article 54) which applies section 193 of the Law of Property Act 1925 (public access rights) to Fen land A and B in Orsett Fen (water vole mitigation and open mosaic habitat) following completion of the habitat mitigation works.	Draft Development Consent Order [REP6-010]	Matter Agreed
Common land	2.1.12	Natural England has requested a long-stop date to apply to the commencement of Section 193 rights on Fen Land A and B. Section 193 rights should be applied to Fen Land A within 12-18 months of the creation of the water vole habitat. Natural England agrees with the provision in Section 54 of the draft DCO.	The Applicant has included the following provision in Article 54 of the draft DCO, which has been agreed with Natural England. 'Designation of Fen Land': (a) In relation to Fen land A, the later of 12 months from the date of completion of the provision of water vole mitigation on that land or 18 months from the date of completion of the provision of water vole mitigation on that land where the undertaker determines, following consultation with Natural England, that	Draft Development Consent Order [REP6-010]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			period is reasonably necessary to allow for the establishment of the water vole mitigation; and (b) In relation to Fen land B, the day after the completion of the provision of open mosaic habitat and grassland on that land.		
Common land	2.1.13 RRE	Natural England has highlighted the importance of continued public access being maintained across Fen Land A and B throughout the construction phase of the Project.	The Applicant has committed not to prevent public access to Fen land A or B throughout the construction phase of the Project unless the prevention of public access is reasonably required for (i) construction purposes; or (ii) health and safety purposes; or (iii) to allow for the protection of any environmental mitigation. The Applicant will inform Natural England as soon as is reasonably practicable of any prevention of public access to Fen land A and Fen land B during the construction period (and the basis on which public access is being prevented). Following a notification that public access is being prevented, Natural England may request an update on when any prevention is expected to cease, and the Applicant will provide a response as soon as is reasonably practicable. This commitment is included within the Stakeholder Actions and Commitments Register.	Stakeholder Actions and Commitments Register [**REP6-050**]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Common land	2.1.14	Natural England is content that the replacement land provided for Orsett Fen in conjunction with the access rights being created on land being used for water vole mitigation and open mosaic habitat provided for Orsett Fen would be no less advantageous to the public and those with rights of common than the existing Common Land provision.	The Applicant welcomes Natural England's confirmation that they agree that the replacement land provision in Orsett Fen in conjunction with the creation of new rights of public access is no less advantageous than the existing provision, as required under Section 131 of the Planning Act 2008.	Planning Statement [**APP-495**] Statement of Reasons [**REP5-028**]	Matter Agreed
Wider Network Impacts					
Bluebell Hill Junction	2.1.15	Natural England's view is that the Blue Bell Hill junction improvements should be included and assessed within the Applicant's ES as part of the cumulative effects assessment.	Improvements to the A229 at the junctions with the M2 and M20 are not part of the proposed Project but they are assessed in ES Chapter 16: Cumulative Effects Assessment. Any future development of the A229, as proposed by Kent County Council, would be subject to the requirements of the National Planning Policy Framework which only allows for development in AONBs in exceptional circumstances and where it can be demonstrated that it is in the public interest. The Applicant is currently in joint discussions with relevant authorities about the proposed improvement works at this location in accordance with the licence obligations to work with others to align national and local plans and investments, balance national and local	Wider Network Impacts Management and Monitoring Plan [**APP-545**] ES Chapter 16: Cumulative Effects Assessment [**APP-154**] Natural England's Written Representation paragraph 6.1.47 [**REP1-262**]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			needs and support better end-to-end journeys for road users.		
Sustainability					
Legacy & Benefits	2.1.16	Natural England welcomes the opportunity to attend the legacy and benefits workshops, and is a member of the environment-focussed legacy and benefits steering group. Natural England has, however, not been able to fully engage with this group as much as it would wish due to resourcing constraints.	Natural England has been invited to attend the legacy and benefits workshops, the first of which was held in December 2019, and is a member of the environment focussed legacy and benefits steering group.	N/A	Matter Agreed
Legacy & Benefits	2.1.17	Natural England welcomes the stakeholder engagement being undertaken through the legacy and benefits steering group, and supports the identification of landscape scale projects to provide wider benefits.	The Applicant welcomes Natural England's positive support for the legacy and benefits workstream. The green infrastructure study, along with ideas proposed at legacy workshops held in December 2019 have been used as the starting point for legacy discussions. Topic-specific steering groups have been set up, of which Natural England is a member, the first being held on 26 January 2021.	N/A	Matter Under Discussion
Environmental Impact Assessment (EIA) methodology					
Assessment methodology	2.1.18	Environmental assessments should follow the avoid, mitigate, compensate hierarchy.	The avoid, mitigate, compensate assessment hierarchy has been followed.	ES Chapter 4: EIA Methodology [APP-142]	Matter Agreed
Mitigation	2.1.19	Natural England has advised that a landscape-scale approach to mitigating the	The landscape scale approach taken by the Project is based on Natural England's advice and guidance received	ES Chapter 8: Terrestrial	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		environmental impacts of the Project should be taken.	from the Defra family at Statutory Consultation in the document 'Defra Family Potential Environmental Legacy Projects'.	Biodiversity [**APP-146**]	
Mitigation & compensation	2.1.20	Notwithstanding its advice in relation to the loss of SSSIs and irreplaceable habitat (SoCG item 2.1.8), Natural England recognises there is a commitment to a significant package of mitigation and compensation measures that will be required should the scheme be consented. The package of measures, which will help build resilience at a landscape scale, is welcomed, subject to further discussion about green bridges (SoCG item 2.1.35).	The compensation and mitigation strategy has been developed through extensive engagement with Natural England.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Natural England's Written Representation paragraph 8.1.4 [**REP1-262**]	Matter Agreed*
Post-development management	2.1.21 RRE	Natural England recognises the importance of the ongoing maintenance of the compensation and mitigation measures. It supports the use of indicators of success, with agreed ecological targets, against which the effectiveness of the mitigation and compensation will be measured. National Highways has successfully used this approach for the A21 Pembury to Tonbridge dualling in Kent, and Natural England recommends a similar approach is adopted for the LTC. Natural England is continuing to have constructive discussions, and agrees that the oLEMP Advisory Group is an	Following construction, monitoring of newly created habitats would be undertaken in accordance with the LEMP. This would outline the required maintenance operations and frequency of monitoring surveys, to measure progress towards defined success criteria for each habitat. Natural England will be a member of the LEMP Advisory Group. As requested by Natural England, the Applicant has updated the oLEMP to confirm that the outline measures of success will be refined during detailed design with consideration of key species groups where necessary to target	Outline Landscape and Ecology Management Plan [**REP4-140**] Natural England's Written Representation paragraphs 6.1.56 and 13.1.1 – 13.1.6 [**REP1-262**]	Matter Under Discussion

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		appropriate mechanism to address this matter during detailed design. As stated during Issue Specific Hearing 6, Natural England considers that a broad suite of ecological and landscape success measures is required. These should be broader than those required for the protected species licences and should include key species groups such as birds, invertebrates and mammals (for example). Such a broad Indicators of Success approach will help ensure that the habitat functions at a landscape and ecosystem level. Natural England welcomes the Applicant's commitment that the oLEMP will be updated to reflect a broader suite of indicators of success at Deadline 7 and we will update our position as appropriate once this is provided.	ecosystems functionality. These changes will be reflected in the Deadline 7 oLEMP.		
Biodiversity net gain (BNG)	2.1.22 RRE	Given the scale of the development, Natural England would expect the Project to deliver BNG in line with the Government's 25 Year Environment Plan. This should be calculated using the Defra biodiversity metric.	The Project has an aspiration to maximise its biodiversity value. BNG has been calculated using the Defra biodiversity metric 3.1 and presented in the DCO application. Further details are provided in ES Chapter 8: Terrestrial Biodiversity.	ES Chapter 8: Terrestrial Biodiversity [APP-146] Natural England's Written Representation paragraphs 10.1.1 – 10.1.4 [REP1-262]	Matter Agreed

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BNG	2.1.23 RRE	Natural England has requested to see the BNG figures that have been calculated for the DCO application. Natural England welcomes the Applicant's' positive approach to BNG on the Project, and the ongoing, constructive engagement on this matter.	The Applicant shared summary BNG outputs with Natural England prior to DCO submission and at a meeting held on 25 November 2022. BNG has been calculated using the Defra biodiversity metric 3.1, and full details are provided in ES Chapter 8: Terrestrial Biodiversity.	ES Chapter 8: Terrestrial Biodiversity [APP-146] Natural England's Written Representation paragraphs 10.1.1 – 10.1.4 [REP1-262]	Matter Agreed
Landscape and visual					
Visual					
Baseline	2.1.105 WR (DL5)	The Environmental Statement appears to show incorrect boundaries for the contiguous West Kent Downs (sub area Cobham) and West Kent Downs (sub area Shorne) Local Landscape Character Areas (LLCA). The Cobham sub area boundary largely follows the northern boundary of the existing A2/High Speed 1 Rail Line alignment whereas the Environmental Statement shows the same Character Area boundary running to the south of the A2/High Speed 1 Rail Line. The incorrect transposition of the boundaries for these two sub-Character Areas is likely to mean that the assessment of landscape and visual effects within the Environmental Statement are incorrect.	The boundaries of the LLCAs within the Kent Downs AONB have not been incorrectly transposed. As detailed in Appendix A of Comments on Written Representations, the boundaries of character areas identified in the studies have been used to inform the definition of the LLCAs, which have been used as a basis for the assessment of effects on the landscape at the local level. In a limited number of locations, the boundaries of the published character areas have been slightly adjusted through detailed study and analysis undertaken for the LVIA. Notwithstanding this slight difference in the West Kent Downs (sub area	ES Chapter 7: Landscape and Visual [APP-145] Comments on Written Representations Appendix A- Statutory Environmental Bodies [REP2-046] Natural England's Written Representation paragraphs 6.1.3, 6.1.4 and	Matter Not Agreed

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			Cobham) LLCA boundary, the effects of the Project are fully assessed either as direct or indirect effects within the West Kent Downs (sub area Cobham) LLCA and/or the neighbouring West Kent Downs (sub area Shorne) LLCA. The findings of these two assessments are then brought together into a combined assessment for the overarching West Kent Downs Landscape Character Area (LCA) 1A. The combined effects reported in the landscape impact summary Tables 7.33 and 7.34 in Section 7.9 of ES Chapter 7: Landscape and Visual, and the overall conclusion of the landscape and visual impact assessment would therefore not differ if the Cobham and Shorne sub area boundary is drawn in a different location.	6.1.7 [**REP1-262**]	
Methodology	2.1.24	The viewpoint locations have been agreed with Natural England. As detailed in Natural England's response to EXQ1 Q12.3.1 [REP4-388], we understood that visualisations were to be prepared for all of the agreed viewpoints as suggested within an email from the Applicant dated 19 April 2019. The Applicant. In their response to our answer [REP5-077] stated that their email	The viewpoint locations have been agreed with Natural England. As detailed in Applicant's Comments on IP Responses to ExQ1 at Deadline 4 [REP5-077]. The Applicant's email to Natural England dated 11 April 2019 was not intended to imply that photomontages would be provided from all 89 Representative Viewpoints. The selection of a smaller range of key	ES Chapter 7: Landscape and Visual [**APP-145**] Natural England's Written Representation paragraph 6.1.5 [**REP1-262**] Applicant's Comments on IP	Matter Agreed

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		of the 19 April 2019 was 'was not intended to imply that photomontages would be provided from all 89 Representative Viewpoints. The selection of a smaller range of key viewpoints from which to provide photomontages represents a proportionate approach to illustrating the Project and this approach is widely recognised as good practice.' Given this, we do not consider the locations of the visualisations were agreed with Natural England.	viewpoints from which to provide photomontages represents a proportionate approach to illustrating the Project and this approach is widely recognised as good practice.	Responses to ExQ1 at Deadline 4 [**REP5-077**]	
Methodology	2.1.25	The cumulative visual impacts of the widened A2 corridor should be considered in combination with High Speed 1.	High Speed 1 is considered as part of the baseline and the visual assessment in ES Chapter 7: Landscape and Visual, which considers the increased visibility of High Speed 1.	ES Chapter 7: Landscape and Visual [**APP-145**]	Matter Agreed
Impacts	2.1.26	Section 5.151 of the NPSNN states that 'The Secretary of State should refuse development consent in these areas [protected landscapes including AONBs] except in exceptional circumstances and where it can be demonstrated that it is in the public interest'. Whilst Natural England has had constructive discussions with the Applicant to identify measures that will help mitigate the impacts, the construction of a highway and junction both within and in the immediate setting of the Kent Downs AONB will result in significant landscape	The Applicant agrees that there is a significant impact on local landscape character within the Kent Downs AONB as detailed within ES Chapter 7: Landscape and Visual. Measures have been taken to minimise damage to Kent Downs AONB where practicable. The impact on the Kent downs AONB is assessed within the Planning Statement as it is a NPSNN) test (paragraphs 5.151 and 5.152). The Applicant's view is that the Project meets the NPSNN test.	ES Chapter 7: Landscape and Visual [**APP-145**] Planning Statement [**APP-495**]	Matter Not Agreed

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		and visual impacts to the AONB that cannot be fully mitigated. Whilst Natural England does not endorse the significant direct and indirect impacts to the Kent Downs AONB, our advice remains that a more significant package of mitigation measures is possible as summarised within Section 6.1.62 of our Written Representation (REP1-262) and recommend the Applicant commits to a more robust package of mitigation measures.			
Impacts	2.1.27	The existing vegetation along both sides of the A2, and the central reservation, including mature trees, currently allows the transport infrastructure to be well screened and accommodated in the landscape. Part of this vegetation was provided as mitigation for High Speed 1. The removal of this vegetation, particularly in the central reservation, will make the widened road and wider transport corridor significantly more visually intrusive in the AONB, and reduce the current wooded context within which it sits, negatively impacting landscape character. Natural England were concerned that they could not fully assess the nature and scale of the impacts detailed within the Landscape and Visual Effects Assessments from the visualisations	Measures have been taken to minimise impacts on the Kent Downs AONB where practicable. Discussions with Statutory Undertakers have resulted in a reduction in woodland loss, including HS1 mitigation, and ancient woodland loss since impacts were first presented to Natural England in 2019. The minimum areas of retained vegetation are detailed in ES Figure 2.4: Environmental Masterplan. The Applicant agrees that the Project will result in the loss of vegetation within the central reservation, which is assessed in ES Appendix 7.13: Views from the Road Assessment. Several securing mechanisms have been included to further reduce the impact on the AONB, including:	ES Figure 2.4: Environmental Masterplan [**REP4-124**, **REP3-098**, **REP2-018**, **APP-162**, **REP4-127**, **REP4-129**, **REP2-024** to **REP2-031**] ES Appendix 7.13: Views from the Road Assessment [**APP-388**] ES Appendix 2.2: Code of Construction	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		provided in the Environmental Statement Figures 7.16 to 7.19. However, Natural England have subsequently received and reviewed the draft landscape cross-sections through the A2/M2/A122 junction, and does not believe that there is adequate mitigation for the Project's impacts on the AONB.	• Design Principle LSP.01 'Retention of existing vegetation' • Register of Environmental Actions and Commitments (REAC) (within ES Appendix 2.2: Code of Construction Practice (CoCP)) commitments: – LV001 'Trees and vegetation retention', – LV013 'Designated/protected trees and hedgerows, utilities' – LV028 'Protection of retained woodland, trees and hedges', – LV029 'Landscape planting' – LV030 'Veteran and ancient tree fencing' The Applicant shared draft landscape cross-sections through the M2/A2/A122 Lower Thames Crossing junction with Natural England on 10 May 2023, to support their review.	Practice (CoCP) [**REP1-157**] Design Principles [**REP3-110**]	
Impacts	2.1.28	Natural England is concerned that the widened transport corridor of the A2 and the High Speed 1 rail line and associated street furniture will be clearly visible to recreational users within the AONB and its setting.	The Applicant's assessment shows that proposed planting would, once established, help to screen views of the widened transport corridor for recreational users, for example as shown in the photomontage view at Brewers Road green bridge. The Applicant shared draft landscape cross-sections through the M2/A2/A122	ES Figure 7.19: Photomontages [**REP6-036**, **REP1-131**, **APP-246** and **REP4-134**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			Lower Thames Crossing junction with Natural England on 10 May 2023 to support their review.		
Impacts	2.1.106 WR (DL5)	Natural England provided detailed advice to National Highways on the Landscape and Visual Impact Assessment chapter of the Environmental Statement for the Lower Thames Crossing application which was withdrawn by the Applicant in late 2020. Natural England is concerned that, despite apparently minor changes being made to the scheme, significant parts of the assessment appear to have been downgraded without a narrative to explain the reasoning. Given the nature and scale of the development within the AONB, they would expect a greater degree of clarity to be provided.	The methodology for the landscape and visual impact assessment has been appropriately applied to assess the realistic worst-case effects likely to arise from the Project described in the DCO application submitted in October 2022. There have been several Project design changes and further development of the Project definition since the DCO application made in October 2020 was withdrawn. The current ES Chapter 7: Landscape and Visual therefore reflects these design changes and a greater level of certainty around the likely effects of the Project following further design development, in particular relating to proposed utilities diversions along the M2/A2 corridor. Furthermore, the definition of baseline landscape and visual conditions has also been critically reviewed and updated since October 2020. The ES Chapter 7: Landscape and Visual submitted with the current DCO application should therefore be read as a standalone assessment and not compared to the version that was withdrawn in late 2020.	ES Chapter 7: Landscape and Visual [**APP-145**] Natural England's Written Representation paragraphs 6.1.6, 6.1.8 and 6.1.9 [**REP1-262**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Impacts	2.1.110 (DL7)	As detailed within Natural England's Written Representation [REP1-262], Natural England is concerned that the proposed ancient woodland compensatory planting at Park Pale would negatively impact the landscape character within this part of the Kent Downs AONB along with views from Viewpoint S-03 to the panoramic wooded landscape within the AONB to the south of the A2/High Speed 1 Corridor. Our review of the Applicant's visualisations from Viewpoint S-03 submitted at Deadline 5 [REP5-046 and 047], confirms our view that the proposed woodland planting is likely to negatively impact the landscape character along with the views and experience of users of the right of way assessed from Viewpoint S-03 within and to the wider AONB in the foreground. We therefore recommend that greater clarity is provided in relation to the landscape and visual impacts resulting from the proposed ecological mitigation in the Park Pale area of the Kent Downs AONB through an updated Landscape and Visual Impact Assessment.	Project Design Report, Part D: General Design South of the River discusses the approach to the Project design, including where the design has considered the Kent Downs AONB. The Design Principles include several clauses requiring that the detailed Project design be reflective of the landscape character of the Kent Downs AONB, including: • Principle S1.06 that requires the detailed design of the landscape mitigation to complement and strengthen the existing character of the Kent Downs AONB. • Principle S1.07 that requires use of a diverse palette of native shrub and tree species characteristic of the local landscape character and of local provenance within the Kent Downs AONB and its setting, in accordance with the Kent Downs AONB Landscape Design Handbook. Ancient woodland compensation planting is proposed to the north of Park Pale bridge, to the east of Shorne Woods Country Park, as shown on ES Figure 2.4: Environmental Masterplan Sections 1 & 1A (1 of 10). Principle S1.08 of the Design Principles requires the design of this woodland to retain key views from the upper slopes of the new woodland	Natural England's Written Representation [**REP1-262**] Deadline 5 Submission - 6.2 ES Fig 7.19 Photomontages – Winter Year 1 and Summer Year 15 (1 of 4) [**REP5-046**] ES Figure 2.4: Environmental Masterplan [**REP4-124**, **REP3-098**, **REP2-018**, **APP-162**, **REP4-127**, **REP4-129**, **REP2-024** **to** **REP2-031** Outline Landscape and Ecology Management Plan [**REP4-140**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			planting area across the M2/A2 corridor to the Darnley Mausoleum within Cobham Park Registered Park and Garden of Special Historic Interest, as well as views to the wider Kent Downs AONB. The oLMEP states that the management requirements of the ancient woodland compensation site to the east of Brewers Wood are: • 'to provide woodland linking Shorne Woods SSSI with Great Crabbles Wood SSSI… • to provide woodland for screening of the Project route whilst retaining key views from the upper slopes of new woodland across to the Darnley Mausoleum • to establish open rides and glades along utility diversion routes and along the proposed footpath routes for public access • to provide a structurally diverse and graduated woodland edge to the rides' The requirement for the design to be in accordance with the Design Principles would ensure that planting within the AONB will be reflective of the landscape character of the Kent Dows AONB.		

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Mitigation	2.1.29 RRE	Notwithstanding Natural England's significant concerns with regard to the scale of the direct and indirect impacts on the Kent Downs AONB (SoCG items 2.1.7 and 2.1.9), it recognises that the Applicant has proposed measures to help reduce the impacts, which Natural England is continuing to discuss and advise on. Whilst these measures will help mitigate the impacts, Natural England considers a significant adverse residual landscape and visual impact in relation to the AONB will remain at year 15. Natural England recommends that the ES is updated to detail how the residual impacts are to be reduced. This could include offsite compensation. Natural England will continue to engage in constructive discussions on this matter up to and including detailed design.	Measures have been taken to minimise damage to the Kent Downs AONB where practicable. Discussions with Statutory Undertakers have resulted in a reduction in woodland loss, including a reduction in ancient woodland loss since impacts were first presented to Natural England in 2019. The potential for mitigation alongside the A2/M2 is limited due to restricted space for planting and the constraints of the utility corridors. The Applicant has included substantial areas of land for woodland planting within vicinity of the A2/M2 corridor and wider AONB. Residual significant effects are reported within ES Chapter 7: Landscape and Visual. The Applicant is engaging with the Kent Downs AONB Unit regarding a compensatory enhancement fund as detailed in their SoCG matter 2.1.26. This compensatory enhancement fund would be secured via a Section 106 agreement with Kent County Council, as detailed in the Draft Section 106 Agreements to be submitted at Deadline 7.	ES Chapter 7: Landscape and Visual [**APP-145**] Statement of Common Ground with the Kent Downs AONB Unit [**REP6-018**] Draft s106 Agreements [**Document references 9.164 - 9.169 (1)**] at Deadline 7	Matter Under Discussion

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Mitigation	2.1.30	Natural England requested further detail on the design of the proposed acoustic barrier due to potential additional urbanising impact on the Kent Downs AONB. Natural England welcomes the removal of the Park Pale acoustic barrier from the design, subject to other noise attenuation measures being included at the detailed design stage (see item 2.1.32).	Following engagement with Natural England and the AONB Unit, the Park Pale barrier has been removed from the design.	N/A	Matter Agreed*
Mitigation	2.1.109 WR (DL5)	Natural England would like additional woodland planting to north of the High Speed 1 Rail Line (instead of 'shrubs with intermittent trees') to provide long-term filtering and screening of views towards the Project and help integrate it with its landscape setting.	Space for proposed reinstatement planting to the north of HS1 (between the railway line and M2/A2 corridor) is limited and constrained by utility corridors. Therefore, to create a sense of woodland character, proposed mitigation planting shown in the Environmental Masterplan comprises a linear belt of shrubs and trees between the M2/A2/A12 Lower Thames Crossing junction and the Halfpence Lane roundabout, shrubs with intermittent trees between the Halfpence Lane roundabout and Brewers Road green bridge and a principally linear belt of shrubs and trees between Brewers Road green bridge and Park Pale bridge.	ES Figure 2.4: Environmental Masterplan Sections 1 & 1A (1 of 10) [**REP4-124**] Environmental Masterplan Section 2 (2 of 10) [**REP3-098**] Natural England's Written Representation paragraph 6.1.62 [**REP1-262**]	Matter Not Agreed
Tranquillity					
Methodology	2.1.31	The tranquillity baseline noise monitoring locations have been agreed with Natural England.	Baseline locations agreed.	ES Chapter 7: Landscape and Visual [**APP-145**]	Matter Agreed

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Impacts	2.1.32 RRE	Natural England expressed concern that there would be a reduction in tranquillity and people's enjoyment of the AONB during construction and after completion of the Project, from both noise and increased lighting. Natural England welcomes the commitment to install low noise road surfacing, including the Applicant's update to REAC Commitment NV013 which states that 'surface renewal will be undertaken using replacement road pavement on the strategic road network that has a no worse noise emission performance (Highway Authority Product Approval Scheme certification values) than that laid for the Project's opening'. Natural England is also concerned that there would be very limited, if any, noise attenuation for recreational users within the Kent Downs AONB, including those using the green bridges; this item is detailed more fully in Item 2.1.108	The Applicant's assessment shows that there would be localised impacts on tranquillity during construction and following completion of the Project. The Applicant has considered Natural England's request for low noise road surfacing to remain in perpetuity, and has updated REAC commitment NV013 at Deadline 5to state: 'a) For the locations identified on ES Figure 12.6, a surfacing system that has a reported noise Road Surface Influence (RSIH) of -7.5dB(A) or better in accordance with the Highway Authorities Product Approval Scheme certification system shall be installed. b) For the locations identified on ES Figure 12.6, a 'Level 3' (i.e. RSIH -3.5 dB(A) or better), very quiet surfacing material, as defined by Manual of Contract Documents for Highway Works Volume 1 - Specification for Highway Works, Series 0900, Table 9-17, shall be installed on all other new and altered trunk roads and associated slip roads forming part of the Project. c) For the locations identified on ES Figure 12.6, a 'Level 2' (i.e. RSIH -2.5dB(A) or better), quieter than Hot Rolled Asphalt surfacing material, as	ES Chapter 7: Landscape and Visual [**APP-145**] Natural England's Written Representation paragraphs 6.1.45, 6.1.46 and 12.1.8 [**REP1-262**] ES Appendix 2.2: Code of Construction Practice (CoCP) [**REP6-038**]	Mater Agreed

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			defined by Manual of Contract Documents for Highway Works Volume 1 - Specification for Highway Works, Series 0900, Table 9-17, shall be installed on all new and altered local roads forming part of the Project. d) Surface renewal will be undertaken using replacement road pavement on the strategic road network that has a no worse noise emission performance (Highway Authority Product Approval Scheme certification values) than that laid for the Project's opening.'		
Indirect effects					
Methodology	2.1.33	The methodology for assessing the indirect effects on the Kent Downs AONB has been agreed with Natural England.	Methodology agreed.	ES Chapter 7: Landscape and Visual [APP-145]	Matter Agreed
Green bridges					
Mitigation	2.1.34	Natural England supports the creation of green bridges. Their design should focus on reducing the impact of increased severance exacerbated by the proposed Lower Thames Crossing for both wildlife and recreational users.	The Applicant welcomes Natural England's support for the creation of green bridges.	ES Chapter 7: Landscape and Visual [APP-145] Natural England's Written Representation paragraphs 12.1.1 – 12.1.2 [REP1-262]	Matter Agreed

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Mitigation	2.1.35 RRE	Exemplary design and the provision of dedicated green/living bridges should be included to address the severance resulting from the new and existing strategic road network for people (WCH routes), landscape, habitats and wildlife. Natural England was originally concerned that the design and linking habitat provided limited habitat connectivity across the widened transport infrastructure, including the High Speed 1 rail line, the Impact of which was increased by the removal of much of the previously implemented mitigation planting. Natural England's view is that an objective for each green bridge should be set out in the Environment Statement. It has advised the Applicant that the Brewers Road green bridge should focus on both ecological and WCH connectivity, and the Thong Lane green bridge south on the WCH experience. Natural England is broadly supportive of the design of the Brewers Road green bridge, but it recommends the WCH path is separated from the carriageway by a substantial strip of species-rich grassland with a low wooden barrier. Natural England also recommends the strip of vegetation along Halfpence Lane (unmanaged hedgerow to the south/south-eastern side)	Green bridges have been individually designed to provide the greatest benefit at each particular crossing location. Several meetings have been held to discuss green bridge designs, including a joint meeting with Kent Downs AONB Unit and Natural England on 16 May 2022. A site visit was held to discuss green bridges on 28 July 2022. The Applicant is currently considering Natural England's requests with regard to Brewers Lane green bridge and Thong Lane green bridge south with environment, landscape and highways specialists. The Applicant presented the initial findings of this work, including proposed updates to Design Principles S1.17 and S2.12, at a meeting on 08 June 2023, and aims to reach agreement on this matter through ongoing discussions.	ES Chapter 7: Landscape and Visual [**APP-145**] Design Principles [**REP6-046**] Natural England's Written Representation paragraphs 12.1.1 – 12.1.2 and 12.1.8 [**REP1-262**]	Matter Under Discussion

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		is extended to provide connection to Ashenbank Wood. An objective should also be introduced for the trees to eventually 'close the canopy' over Halfpence Lane, enabling greater habitat connectivity for species such as dormice. Regarding Thong Lane green bridge south, Natural England agrees that the WCH route should be on the eastern side of the bridge. However, Natural England considers it should pass through a substantial band of natural habitat. Natural England has recommended a narrow band of woody/scrub habitat is provided on the western side to signal the entry to the AONB. On the eastern side, it has recommended that a wider, more substantial area of species-rich grassland transitioning to scrub/woodland is provided, through which the WCH route will pass. An objective should also be introduced for the trees to eventually 'close the canopy' over the realigned Thong Lane. These matters were discussed at a constructive site visit with the Applicant on 28 July 2022. Natural England agrees that if these changes are implemented, the green bridge designs will help reduce the impacts of severance for both wildlife and recreational users. However, for a scheme			

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		of this size Natural England considers the approach could be more exemplary, to help further reduce the large residual visual impacts to the AONB.			
Mitigation	2.1.108 WR (DL5)	Natural England considers that additional mitigation measures to help reduce the significant adverse residual landscape and visual impacts to the Kent Downs AONB are possible and should be more fully explored and secured. These are summarised in Section 6.1.62 of our Written Representation (REP1-262) and include (amongst others): • Greater clarity on the design, finish and colour of street furniture and structures (this matter is considered separately in item 2.1.39) • Potential for an additional green bridge at Park Pale • Woodland planting to the north of the High Speed 1 rail line (rather than shrubs with intermittent trees) • Use of sensitively designed sympathetic visual and acoustic barriers to reduce the scheme effects on recreational users within the AONB Unit, particularly on the green bridges and connecting footpaths/rights of way	The Applicant has responded to each of Natural England's requested additional mitigation measures below: • Consideration of the colour of materials used and finishes to the built structures within the AONB can be found at item 2.1.39 of this SoCG. • The Applicant does not consider that there is justification to deliver a green bridge at Park Pale because it is not needed to mitigate the impacts of the Project identified in the environmental assessment. Furthermore, there is extensive replacement tree and shrub planting and ancient woodland compensation planting proposed in the Park Pale area to help reduce the landscape and visual effects associated with the Project. • In relation to woodland planting to the north of the High Speed 1 rail line, this can be found at item 2.1.109 of this SoCG. • No acoustic barriers are proposed within the Kent Downs AONB. ES	Natural England's Written Representation paragraph 6.1.62 [REP1-262] Design Principles [REP6-046] ES Appendix 12.10: Road Traffic Noise Mitigation and Cost Benefit Analysis [APP-450]	Matter Not Agreed

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		• Use of native species of local provenance (now confirmed) (this matter is considered separately within 2.1.41)	Appendix 12.10: Road Traffic Noise Mitigation and Cost Benefit Analysis details the appraisal undertaken to inform the conclusions relating to the acoustic mitigation strategy for operational road traffic noise. • Clause LSP.02 of the Design Principles states that proposed planting mixes 'will include native species of local provenance'.		
Mitigation	2.1.36 RRE	Natural England is concerned that local roads will be a dominant feature on the green bridges.	Efforts have been taken to reduce the dominance of local roads on green bridges, for example, Thong Lane South green bridge has been increased by 10m to give the green corridor much greater width than the highway. The adjacent 'lane' character will be retained as far as possible for users of the bridge. For example, contractors will be required to use hedgerow planting and encouraged to use timber vehicle restraint systems that will be more appropriate to context and reduce the 'urbanisation' of the route as far as it is safe to do so. For example, Design Principle STR.11 'Green bridge vehicle restraint systems (VRS)' states: '*To help maintain the rural lane character of the landscape over green bridges, where it is identified that VRSs are*	Design Principles [**REP6-046**]	Matter Not Agreed

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			required (in addition to, instead of, or combined with structural parapets), VRSs shall be a timber National Highways certified system for the level of use identified.'		
Mitigation	2.1.37 RRE	Natural England has provided its literature review for green bridges, which provides detailed recommendations on the minimum parameters needed for these structures to be effective. The review also highlights ways in which multiple outcomes, including landscape, recreation, biodiversity and wider natural capital benefits can be achieved. Natural England do not believe that the recommended minimum widths of 'green' for the bridges to be effective for ecology and landscape are achieved.	Natural England's literature review has been noted and considered alongside the various constraints of the sites. In 'Responses to the Examining Authority's ExQ2 Appendix G – 11. Biodiversity (Part 1 of 2)' [**REP6-106**], in response to question ExQ2_Q11.2.5, the Applicant sets out why they don't agree with Natural England's statement that 'the recommended minimum widths of 'green' are [not] achieved for the bridges to be effective for ecology and landscape'.	Responses to the Examining Authority's ExQ2 Appendix G – 11. Biodiversity (Part 1 of 2) [**REP6-106**]	Matter Not agreed
Design of retaining wall materials	2.1.38 RRE	Natural finishes appropriate to the AONB should be used in the construction or facing of retaining structures and bridge headwalls. Natural England has suggested that the discussions the Kent Downs AONB Unit and Natural England have had with National Highways on the M2 Junction 5 flyover may be helpful in supporting this.	The Applicant has considered feedback from Natural England and the Kent Downs AONB in relation to the M2 junction 5 flyover. Design Principles have been included to commit to the use of natural finishes appropriate to the AONB including: • STR.03 (Project Enhanced Structures: Thong Lane green bridge north (Work No 3B))	Design Principles [**REP6-046**] Natural England's Written Representation paragraph 6.1.62 [**REP1-262**]	Matter Agreed*

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			• STR.06 (Project Enhanced Structures: consistent design approach) • STR.07 (Bridge structures)		
Finish to structures and street furniture within the AONB	2.1.39 RRE	Natural England has advised there should be greater consideration of the materials used, with particular regard to the Kent Downs AONB guidance on the selection and use of colour in developments. This should include all street furniture (such as the lighting columns, gantries and other infrastructure), to ensure that all structures in the AONB will be finished appropriately. Natural England welcomes the ongoing constructive discussions on this matter, and agrees that if Design Principle S1.09 is updated to make specific reference to street furniture, this matter would be agreed. .	Design Principle STR.06 Project Enhanced Structures: consistent design approach has been updated to include Materials shall be self-finished, (as far as technically practicable whilst complying with DMRB standards), minimising maintenance while being consistent and appropriate to the colour palette required in the Kent Downs AONB'. Design Principle S1.09 also commits to '*Retaining structures and bridge abutments within the Kent Downs AONB and its setting, shall be either green walls, earth banks, or clad with hard materials in accordance with the Kent Downs AONB Landscape Design Handbook, to be reflective of the local vernacular*'. The Applicant welcomes the constructive engagement on this matter to date and will consider Natural England's request to update Design Principle S1.09 to make specific reference to street furniture before Deadline 8.	Design Principles [**REP6-046**] Natural England's Written Representation paragraphs 6.1.54 and 6.1.62 [**REP1-262**]	Matter Under Discussion

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Environmental Masterplan					
Mitigation	2.1.40	Natural England would like early sight of the Environmental Masterplan, and will continue constructive discussions once the submitted document is made available.	ES Figure 2.4: Environmental Masterplan was issued to Natural England on 05 May 2020 and 01 December 2020. The updated Geographic Information Systems (GIS) layer containing the environmental design was issued to Natural England on 28 April 2022.	ES Figure 2.4: Environmental Masterplan [**REP4-124**, **REP3-098**, **REP2-018**, **APP-162**, **REP4-127**, **REP4-129**, **REP2-024** to **REP2-031**]	Matter Agreed*
Mitigation	2.1.41	Natural England does not support the use of non-native species in planting mixes provided for conservation purposes, including for the proposed compensatory woodland planting for impacts on SSSIs and ancient woodland, where the species mix should reflect the native species composition of the affected sites. Natural England also encourages the use of natural regeneration as a preferred method for habitat creation and welcomes the Applicant's support for the use of this approach to help establish these new woodland areas. Agreement on planting mixes for Hole Farm was reached through engagement with the Applicant and Forestry England. Areas intended for ancient woodland	Taking advice from Forestry England, the Applicant has included some non-native broadleaved species in its species mixes to provide resilience to climate change. The Applicant has committed to use only native species within the AONB, and on green bridges. The Applicant has updated Section 8.23 of the oLEMP to confirm that planting type LE8.2 'Ancient Woodland compensation planting' will only include native species. The Applicant has also updated the oLEMP to include an additional management area (5.17) relating to the Shorne and Ashenbank Woods SSSI compensation area. These changes will be reflected in the Deadline 7 oLEMP.	ES Figure 2.4: Environmental Masterplan [**REP4-124**, **REP3-098**, **REP2-018**, **APP-162**, **REP4-127**, **REP4-129**, **REP2-024** to **REP2-031**] Natural England's Written Representation paragraph 6.1.50 [**REP1-262**]	Matter Under Discussion

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		compensation will comprise native species of local provenance. Natural England's advice is summarised by email dated 14th December 2022 to those involved in the discussions. Subject to the update to Section 8.23 of the oLEMP to reflect that ancient woodland compensation planting should only include native species, and the additional section in the oLEMP to reflect that compensation planting for Shorne and Ashenbank Woodland SSSI would only include native species, Natural England considers this matter to be agreed.	Agreement on planting mixes for Hole Farm was reached through engagement with Natural England and Forestry England. Discussions on the precise details regarding the establishment and management of ecological mitigation and compensation are ongoing and will continue throughout the detailed design process.	Outline Landscape and Ecology Management Plan [REP4-140]	
Mitigation	2.1.42	Natural England has had constructive discussions concerning Kent County Council's proposals for a car park on the western side of Shorne Woods Country Park. Natural England has stated its support for a 'low key' car park (subject to an assessment of the potential impacts on the SSSI), where it can be demonstrated that this would help facilitate wider access to the WCH network in the area. Natural England is concerned about the potential for increased recreation pressure on the SSSI, given the proposed car park's location immediately adjacent to the designated site, in an area where parking is currently not provided.	The Shorne Woods Country Park car park has been requested by Kent County Council and Shorne Woods Country Park. Currently parking in this area is inadequate, and people therefore park on pavements, access only roads, cycle paths and verges, which is a safety issue. A car park in this location forms an important part of the Lower Thames Crossing WCH strategy and would provide connectivity to the wider WCH network, including access via the green bridge to the south of the A2/M2. The Applicant considers that the car park would not result in additional pressure on the SSSI as its intention is to manage existing pressures, and any additional	Design Principles [REP6-046] ES Chapter 8: Terrestrial Biodiversity [APP-146] ES Chapter 13: Population and Human Health [APP-151] Environmental Statement Addendum [REP6-054]	Matter Under Discussion

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		Natural England would therefore not support a proposal for a more substantial car park (with proposed infrastructure including greater parking provision, and additional parking for facilities such as horseboxes), as this may result in increased pressure on the SSSI. Natural England would expect the potential recreation impacts to the SSSI from a car park proposal to be assessed as part of the ES. Natural England has provided detailed comments on the Environmental Statement Addendum (REP1-181) in our Deadline 2 response (REP2-090) in which we sought greater clarity on the nature and scale of the potential impacts from the proposed car park and surface upgrades along with details of any mitigation required. Natural England is awaiting the updated assessment of the potential impacts from the car park and surface upgrade within the SSSI and details of any mitigation measures that may be required. We understand that the Applicant will formally withdraw the Thong Lane car park at Deadline 7 and will provide our updated comments once this has been confirmed. Natural England's concerns regarding the surface upgrade to the cycle route	visitors would be spread across the new WCH network and recreational opportunities. Discussion on this matter is ongoing, and the Applicant provided Natural England with a technical note on this matter on 7 July 2023 (Annex C.14). This report was submitted at Examination Deadline 1 as an addendum to the ES. Meetings to discuss Natural England's comments on the ES Addendum were held on 20 September 2023, and on 10 October 2023. Following engagement with Natural England and other stakeholders, the Applicant has taken the decision to remove the Thong Lane Car Park from the Project. This will be reflected at Deadline 7.	Natural England's Written Representation paragraphs 5.1.5 – 5.1.9 and 5.1.20 [REP1-262]	

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		diversion through Ashenbank Woods remains and is not related to the Thong Lane car park.			
Terrestrial biodiversity					
Scope of assessment					
Methodology	2.1.43 RRE	Natural England welcomes the consideration in the ES of the impacts to designated sites that may result from this Project, both within the application boundary and the wider area of influence.	The study area for terrestrial and marine biodiversity encompasses the Project's Zones of Influence. Statutory designated sites have been assessed up to 2km from the Order Limits, with an expanded study area for European Sites designated for bats within a 30km radius.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] ES Chapter 9: Marine Biodiversity [**APP-147**]	Matter Agreed*
General methodology					
Impacts	2.1.44 RRE	For all adverse impacts, a comprehensive habitat balance sheet containing data before, during and post construction/operation should be included within the ES, including the timeframe for habitat maturity. Natural England has also advised that the submission should clearly set out which land has been identified to compensate for specific, high value receptors (e.g., acid grassland).	Tables 8.30 and 8.33 in ES Chapter 8: Terrestrial Biodiversity, detail habitat losses and gains in Kent and Essex. ES Appendix 8.21: Biodiversity Metric Calculation explains the process behind the loss/gain calculation. The Applicant also presented areas of impact, mitigation and compensation across the Project to Natural England at a meeting on 18 May 2022 and shared a technical note regarding acid grassland compensation proposals on 01 June 2023 (Annex C.10).	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] ES Appendix 8.21: Biodiversity Metric Calculations [**APP-417**] Natural England's Written Representation paragraph 8.2.3 [**REP1-262**]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Designated sites	2.1.104 WR (DL5)	Natural England has recently noticed that there are some boundary mapping errors within their publicly available digital datasets for the Shorne and Ashenbank Woods SSSI in the vicinity of Darnley Lodge Lane. It would appear appropriate for the Environmental Statement to reflect the full boundary of the SSSI and any additional impacts that may result. Natural England welcomes the Applicant's revised plan included at Annex C.16 of this SoCG, however requests that this plan should be included in the oLEMP. Should this plan be submitted in the oLEMP, Natural England would consider this matter to be agreed.	The Applicant has reviewed the boundary of Shorne and Ashenbanks Woods SSSI provided by Natural England, as detailed in Appendix A of their comments on Written Representations. The revised plan is included at Annex C.16 of this document. Although this change in the SSSI boundary results in a larger overall area of the SSSI being affected (an increase of 1.12ha), the habitat is acknowledged as being of lower quality than that within the two woodlands north and south of it. It is therefore considered that the SSSI integrity would still remain with this increase in area loss and therefore the conclusion presented within the application, of a moderate adverse effect which would be significant, remains robust. The Applicant will include the plan included at Annex C.16 of this document in the oLEMP at Deadline 7.	Comments on Written Representations [**REP2-046**] ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Natural England's Written Representation paragraphs 5.1.2 [**REP1-262**]	Matter Under Discussion
Invertebrates					
Methodology	2.1.45	The ecological survey methodology has been agreed with Natural England.	Methodology agreed.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Methodology	2.1.46	Natural England advised that Essex Field Club data should be requested and included in the baseline data for the terrestrial biodiversity ES chapter.	Data has been received from Essex Field Club and has been included in the baseline of ES Chapter 8: Terrestrial Biodiversity.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**]	Matter Agreed
Methodology	2.1.47	Natural England advised that the recently notified Langdon Ridge SSSI should be included in the impact assessment.	Langdon Ridge SSSI has been included in the assessment of impacts to statutory and non-statutory designated sites that fall within the Zone of Influence for the Project. Full details are provided in ES Appendix 8.1: Designated Sites.	ES Appendix 8.1: Designated Sites [**APP-390**]	Matter Agreed
Baseline data	2.1.48 RRE	Natural England was concerned, given the changes to the Order Limits since invertebrate surveys were undertaken, that the baseline surveys may not be sufficiently robust. Natural England also asked if any granularity could be provided to the survey data. Additional surveys have now been carried out at Natural England's request in areas such as the vicinity of the northern portal. Natural England has requested clarification regarding the baseline data which is being relied upon for the inclusion of areas more recently added to the DCO boundary (such as nitrogen deposition compensation areas). Natural England supports the application of the precautionary principle where uncertainties exist.	It is not possible to provide greater granularity to the survey data because of the way the data was collected. However, assigning the highest valued invertebrate assemblage found within the survey area to the whole survey area rather than discrete areas within it ensures a precautionary approach to the assessment. Following discussion with Natural England, additional invertebrate surveys have been undertaken to provide more detail where requested. The full survey report is included in ES Appendix 8.3: Terrestrial Invertebrates. Baseline ecological surveys, including UKHabs and protected species surveys, have been undertaken for all nitrogen deposition compensation sites. Areas of existing high-quality habitat (including	ES Appendix 8.3: Terrestrial Invertebrates [**APP-392**] Natural England's Written Representation paragraphs 7.1.9 and 7.2.10 [**REP1-262**]	Matter Agreed*

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			invertebrate habitat) will be retained in line with the objectives of the nitrogen deposition compensation to build on existing biodiversity value.		
Data	2.1.103 (DL2)	Natural England has advised that the project should take steps to source and take into account additional third party data (including that referred to in the Port of Tilbury's Relevant Representation), especially where this is more recent than its own and where data resolution allows greater accuracy to inform project design.	The Applicant received the reports referred to in the Port of Tilbury London Limited's (PoTLL) Relevant Representation on 4 July 2023. The Applicant will use this, and any other relevant data to support discussions with Natural England, including in the development of a heat map to highlight high priority areas for invertebrates. The draft heat map has been shared with Natural England for review, and would be available to the delivery partner, to inform detailed design.	ES Appendix 8.3: Terrestrial Invertebrates [**APP-392**] Natural England's Written Representation paragraphs 7.1.9, 7.2.10, 7.2.12 and 7.2.18-7.2.27 [**REP1-262**]	Matter Under Discussion
Baseline data	2.1.49 RRE	Natural England had concerns about the invertebrate baseline at Goshems Farm (a former local wildlife site), which is based on the Ingrebourne Valley Limited (IVL) restoration plan (planning permission reference 17/00412/FUL, which has undischarged planning conditions relating to ecological provision). However, Natural England now welcomes the precautionary approach taken by the Applicant, as detailed in item 2.1.48, subject to confirmation from Thurrock Council that application 17/00412/FUL	The invertebrate baseline at Goshems Farm has been discussed at length with Natural England. In the absence of any other consented proposal, the Applicant's view is that the use of the IVL restoration plan (planning permission reference 17/00412/FUL) is an appropriate approach. Thurrock Council confirmed via e-mail on 25 November 2022 that application 17/00412/FUL represents the reference planning framework for this area.	ES Appendix 8.3: Terrestrial Invertebrates [**APP-392**] Natural England's Written Representation paragraphs 7.2.13 and 7.2.14 [**REP1-262**]	Matter Agreed

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		represents the reference planning framework for this area. Natural England now considers this matter to be agreed.	In line with ES Chapter 8 Terrestrial Biodiversity, paragraph 8.4.184, the aspirational masterplan associated with planning permission 17/00412/FUL was used in preference to the consented masterplan as this provided a more precautionary approach for the Project's baseline. Reference to this aspirational masterplan is 19/00051/CV_01 RMASTERPLAN. Although this includes East Tilbury Landfill and Coalhouse Point fields, they were excluded from the baseline for the Project.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**]	
Mitigation	2.1.50 RRE	Natural England requested additional mitigation for terrestrial and aquatic invertebrates, due to direct impacts to high quality habitats around the north portal. Natural England has also advised that indirect effects to other parts of the ditch network will need to be mitigated to retain interest in situ. Natural England recognises the Applicant has now included additional invertebrate habitat at Tilbury Fields and west of Coalhouse Fort. Natural England agrees this is likely to provide appropriate mitigation, to be confirmed upon review of the updated ES.	The Applicant welcomes Natural England's support for the additional invertebrate habitat at Tilbury Fields. Tilbury Fields has been included in the design to respond to Natural England's request for additional invertebrate mitigation. This large area of open mosaic habitat links to other areas of high quality retained invertebrate habitat identified as part of the invertebrate baseline. An additional area of invertebrate habitat has also been included to the west of Coalhouse Fort to mitigate for the loss of the ditch adjacent to the IVL mitigation site. The Applicant has completed additional surveys, as requested by Natural	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] ES Appendix 8.3: Terrestrial Invertebrates [**APP-392**] Natural England's Written Representation paragraph 7.2.5 [**REP1-262**]	Matter Agreed*

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			England, the results of which are detailed in ES Appendix 8.3: Terrestrial Invertebrates.		
Mitigation	2.1.51	In light of the Port of Tilbury's proposed Freeport, and the subsequent changes made by the Applicant to its initial Tilbury Fields proposal, Natural England recognises that the Applicant's aim is that the updated design will continue to provide the overall functionality achieved by the original design.	The objective of the Tilbury Fields design is to provide improved connectivity for invertebrates. The previous Tilbury Fields design included 44 hectares (ha) of open mosaic habitat, and the updated Tilbury Fields design includes 44.5ha of open mosaic habitat. The updated design provides the same overall functionality of habitat connectivity for invertebrates through connecting the IVL ecological mitigation area to other existing habitats.	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Agreed*
Mitigation	2.1.52	In relation to the Tilbury Fields design, whilst the invertebrate interest is of particular importance, the Project should also consider opportunities to restore and enhance riverside habitats which are scarce in the area. Natural England accepts that, due to the emergence of the Freeport development, and subsequent re-design of Tilbury Fields, it is no longer possible to provide low-lying wetland riverside habitats in this riverside location. Natural England appreciates both the step-change away from former low-lying contours, which has	Due to the nature of the interaction with the Freeport and the re-design of Tilbury Fields, it is not possible to restore riverside habitats in this location. However, riverside habitats for example ditch banks and scrapes, will be created as part of the HRA wetland creation mitigation located at Coalhouse Point.	ES Chapter 8: Terrestrial Biodiversity [APP-146] Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment	Matter Agreed

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		already been made through the permitted restoration scheme at Goshem's Farm, and also the balance of opportunity for the retention, in-situ, of excavated materials (and their beneficial re-use).		[APP-487 and APP-488]	
Mitigation	2.1.53	Natural England has been advised that the design now includes a maximum height of 24.0m AOD. Natural England agrees that the aspirations for biodiversity potential at Tilbury Fields could be achieved with this proposal. The placement, accessibility, topography (to help mitigate the effects of wind exposure on invertebrate habitat) and aspect of critical substrates, including PFA will however, be important.	The design now includes a maximum height of 24.0m AOD. The Applicant welcomes Natural England's agreement that the aspirations for biodiversity potential at Tilbury Fields could be achieved with this proposal.	ES Figure 2.4: Environmental Masterplan [REP4-124, REP3-098, REP2-018, APP-162, REP4-127, REP4-129, REP2-024 to REP2-031]	Matter Agreed*
Mitigation	2.1.54 RRE	Pulverised fuel ash (PFA) is an ecologically important and locally characteristic substrate for invertebrate open mosaic habitats. Although Natural England welcomes the general approach to Design Principle LSP.22 'Approach to Open Mosaic Habitat', which commits to the use of PFA, it would expect a commitment to using a higher total volume and proportion of PFA as the substrate in the creation of open mosaic habitat. This is in recognition that it is a finite resource with unique chemical and physical properties, which significantly	Design Principle LSP.22 'Approach to Open Mosaic Habitat' commits to using PFA and sands and gravels generated by the construction works to provide approximately 10% of overall area of the open mosaic habitat substrate to mimic the substrate in areas where the habitat is currently found within the Order Limits. In response to Natural England's request, the Applicant has now agreed to double the PFA provision from 10% to 20% of the low-nutrient, free-drainage grassland provision within the OMH creation. The Applicant also agrees that	Design Principles [REP6-046] Natural England's Written Representation paragraphs 7.1.10, 7.2.3, 7.2.6-7.2.8, 7.2.15 and 7.2.16 [REP1-262]	Matter Agreed

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		elevate its ecological importance above other inert substances. Natural England welcomes the ongoing constructive discussions on this matter, and is confident that agreement can be reached by detailed design. Natural England understands that the project has agreed to double the provision of PFA for habitat creation from 10% to 20% of the low-nutrient, free-drainage grassland provision within the OMH creation (reported at meeting on 14th June 2023), amounting to 20ha in total for OMH habitats north of the River, with a focus on Tilbury Fields. Natural England agrees that the oLEMP Advisory Group is the appropriate forum to develop the overall strategy for deployment of PFA-based habitats. Chemical composition of PFA will be an important consideration of the deployment strategy, should PFA need to be sourced from an off-site supply.. On the assumption that the supply of PFA can be evidenced, which the Applicant has indicated that it can, this is an agreed matter.	the PFA will be focussed at Tilbury Fields. The strategy for the deployment of PFA will be developed through the oLEMP Advisory Group as part of the detailed design, in consultation with Natural England.		
Mitigation	2.1.55 RRE	Natural England requested further information on invertebrate impacts in the context of its SSSI scoping study, including an understanding of the baseline for the new Tilbury Fields site. This was to enable	Several meetings have been held to discuss the invertebrate assessment within the context of Natural England's SSSI scoping study.	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Agreed*

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		Natural England to understand the uplift in terms of provision for invertebrates. Natural England has attended several meetings with the Applicant to discuss the invertebrate assessment. Natural England is supportive of the revised Tilbury Fields proposals, subject to detailed design and appropriate use of key substrates (including PFA as detailed in item 2.1.54).	In the previous design, the land now allocated for Tilbury Fields was classified as 'return to agriculture' and therefore the uplift to provide open mosaic habitat for invertebrates is sufficient and appropriate.		
Terrestrial Biodiversity	2.1.56 RRE	Following the publication, in 2019, of an update to the Joint Nature Conservation Committee's Guidelines on the selection of SSSIs for invertebrate features, Natural England is looking across the Thames Estuary to assess the case for any possible new SSSIs. Whilst Natural England's assessment of evidence is not yet finalised, it has highlighted that sites in and around the Project appear to hold important assemblages of invertebrates as well as important bird and vascular plant populations. Natural England welcomes the collaborative joint working with the Applicant on this matter, and as part of this has shared with them Natural England's area of interest. Natural England recognises that the Applicant's avoidance, mitigation and compensation measures have been designed to provide a package to address the impacts on the important	The Applicant has worked collaboratively with Natural England on this matter. The Applicant has provided their survey data to Natural England, including macro-invertebrate data from summer 2022 (Annex C.11), and has undertaken additional invertebrate surveys to support Natural England's SSSI scoping study. The Applicant has developed their invertebrate mitigation strategy so that it is sufficiently robust should a site near the north portal be designated for its invertebrate interest. Detailed discussions on this matter are ongoing, most recently on 28 March 2023, 06 April 2023, 19 April 2023 and 12 July 2023. The Applicant is committed to continued engagement with Natural England on the detailed design of all ecological mitigation and compensation to provide	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Natural England's Written Representation paragraphs 7.5.1 and 7.5.2 [**REP1-262**]	Matter Under Discussion

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		invertebrate assemblage. Natural England will continue to work with the Applicant to help advise on the results of the additional surveys that have been undertaken. Natural England and the Applicant are also continuing to hold constructive discussions on the measures that may be needed to address impacts on important bird and vascular plant populations.	the best outcomes for wildlife, including invertebrates, birds and vascular plants.		
Ramsar					
Impacts	2.1.57	Natural England was concerned that the proposed tunnelling could potentially result in impacts to the ground water quality and quantity of the Ramsar site. Based upon its review of the modelling undertaken by the Applicant, Natural England concurs with the conclusion of no LSE. Natural England has advised the Applicant that the monitoring of groundwater levels, flow and quality within the Ramsar site should be undertaken throughout the construction phase to ensure that any unexpected impacts to the site can be managed.	The conclusion of ES Chapter 8: Terrestrial Biodiversity and the HRA is no likely significant effects (LSE) in relation to disturbance or habitat loss resulting from the Project. Further to engagement with Natural England, the Applicant has agreed to undertake monitoring as detailed in REAC commitment RDWE018a 'ground protection tunnel': '*…Water and flow monitoring within the tunnel would be undertaken for the periods that the ground improvement tunnel is being used for construction purpose, in consultation with the Environment Agency, to verify compliance with the tunnels design specification regarding maximum permissible rates of water ingress.*'	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] ES Appendix 2.2: CoCP [**REP6-038**]	Matter Agreed

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Impacts	2.1.58	Natural England welcomes the change to the design of the South Portal discharge, which has ensured there is no land take in the Ramsar site.	The Applicant has changed the operational surface water discharge design to prevent land take in the Ramsar site.	N/A	Matter Agreed
Impacts	2.1.59	Sufficient safeguards should be in place to ensure that the discharge water quality and quantity from the South Portal compound are appropriate, and that there is a mechanism to ensure that these standards will be met. Natural England has provided details of the water quality indicators which need to be met for any discharge, and subject to these being met, Natural England agrees that the REAC commitment RDWE033 adequately resolves this matter. This matter is therefore now agreed.	It is agreed that water discharged into the Thames Estuary and Marshes Ramsar site from the southern tunnel entrance compound will be permitted by the Environment Agency. The Environment Agency will determine the appropriate water quality standards and discharge rates through their permitting process. The assumption for the assessment is that clean water is discharged at greenfield runoff rates. This is secured by REAC commitment RDWE033 'Discharge from construction of South Portal'.	ES Appendix 2.2: CoCP [**REP6-038**]	Matter Agreed
Woodland					
Impacts	2.1.60 RRE	Natural England does not endorse the loss of and damage to ancient woodlands and SSSIs, which are afforded significant protection in planning policy (sections 5.28, 5.29, and 5.32 of the NPSNN). Notwithstanding this advice, Natural England recognises there is a commitment to a significant package of mitigation and compensation measures that will be required should the scheme be consented.	The Applicant recognises the level of policy protection given to SSSIs and ancient woodland. The Project has been designed to minimise adverse effects on these habitats. Where adverse effects are unavoidable, the Applicant's strategy to address these impacts is considered to be in line with discussions with Natural England. Alternative design options are	ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**]	Matter Not Agreed

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		Given the greater impacts as a result of scheme refinements since the preferred route announcement, the ES should clearly demonstrate how the environmental impacts of the proposed Project compare with alternative options, including those previously discounted.	set out in ES Chapter 3: Assessment of Reasonable Alternatives. Significant improvements have been made since the Supplementary Consultation in 2020. Ancient woodland compensation planting has been proposed as part of the mitigation strategy and supports improved habitat connectivity within the wider landscape.		
Impacts	2.1.61	Natural England requested information on the exact area of ancient woodland loss and received an update in a presentation by the Applicant on 13 July 2022. Natural England will continue to advise on this matter as part of its review of the DCO application documents.	Areas of ancient woodland loss have been presented to Natural England and are detailed in ES Chapter 8: Terrestrial Biodiversity.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**]	Matter Agreed*
Impacts	2.1.62	Natural England welcomes the detailed and ongoing assessment of the effects of nitrogen deposition on sites designated for their wildlife importance. Natural England is pleased that the assessment, following advice it provided, has been revised to include the consideration of ammonia. Natural England's advice on compensation for nationally and locally designated sites and areas of ancient woodland has been provided in the context that, should the scheme be approved, the compensation areas will be a necessary part of the package of measures needed to address	The effect of nitrogen deposition changes from the Project on nationally and locally designated sites and ancient woodland has been fully assessed using Design Manual for Roads and Bridges LA 105 (Highways England, 2019) and reported in ES Chapter 8: Terrestrial Biodiversity. Compensation has been included and agreed with Natural England for unmitigable nitrogen deposition effects. The assessment of nitrogen deposition on European sites is set out in the	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment	Matter Agreed*

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		the impacts from nitrogen deposition. Natural England supports the approach being taken and will continue to advise on the detailed design of these areas, and welcomes the Applicant's ongoing commitment to engaging with stakeholders and landowners. Natural England is also continuing to have constructive discussions with the Applicant on the assessments for SACs, as detailed in SoCG items 2.1.91 and 2.1.95.	Habitats Regulations Assessment (see SoCG items 2.1.91 and 2.1.95).	[**APP-487** and **APP-488**]	
Mitigation	2.1.63	Natural England considers that, given the time for woodland to establish, any woodland creation should be created as early in the project as possible, particularly for impacts to SSSIs and ancient woodland.	Advanced woodland planting would be undertaken as early in the programme as practicable, as set out in REAC commitments LV029 and TB001 (ES Appendix 2.2: CoCP). This would largely be restricted to areas that are set back from the Project route and which are not affected by any enabling or main works construction areas, haul routes, utilities diversions or permanent works (examples of this would be some of the areas of proposed woodland planting between Brewers and Great Crabbles Wood, woodland planting adjacent to Jeskyns Community Woodland and new areas of woodland associated with the M25 junction 29 ancient woodlands).	ES Appendix 2.2: CoCP [**REP6-038**] ES Figure 2.4: Environmental Masterplan [**REP4-124**, **REP3-098**, **REP2-018**, **APP-162**, **REP4-127**, **REP4-129**, **REP2-024** **to** **REP2-031**]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			REAC commitment LV029 'Landscape Planting' (ES Appendix 2.2: CoCP) states: '*Planting identified on the Environmental Masterplan (Figure 2.4) would be undertaken at the earliest practicable opportunity.* *Where planting is being undertaken to landscape or provide environmental mitigation on land used temporarily for the authorised development, planting for the implementation of environmental mitigation would be undertaken at the earliest practicable planting season after completion of that part of the construction works and in accordance with the LEMP.* *Planting on land taken solely for environmental mitigation purposes would be undertaken at the earliest practicable planting season following commencement of authorised development and in accordance with the LEMP.*'		
Compensation	2.1.64	The NPSNN recognises, in paragraph 5.32, that ancient woodland is an irreplaceable habitat, and that 'Once lost it cannot be recreated.' Whilst Natural England does not endorse the impacts to ancient woodland, it has	The Applicant acknowledges that it is not possible to replace ancient woodland. The landscape strategy for new areas of woodland planting aims to link areas of retained ancient woodland to improve connectivity and reduce fragmentation	ES Chapter 7: Landscape and Visual [**APP-145**] ES Appendix 2.2: CoCP [**REP6-038**]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		held constructive discussions with the Applicant regarding the mitigation and compensation measures that would be required if the scheme is granted consent. Natural England considers the proposed compensation measures will be of particular benefit where they help build nature recovery, and Natural England supports the landscape-scale approach that has been taken to identifying the proposed compensation areas, with its aim of enhancing the resilience of the affected sites by strengthening the ecological connectivity between them.	effects, which would provide wider biodiversity benefits (further details are available in ES Chapter 7: Landscape and Visual). REAC commitment TB028 'Ancient Woodland Soil Translocation' states that areas identified on the Environmental Masterplan for compensatory ancient woodland planting to offset the loss of ancient woodland would be inoculated, where reasonably practicable, with soils from ancient woodland sites within Order Limits (as identified on ES Figure 8.1) that would be disturbed by construction activity.	ES Figure 8.1: Designated Sites [**APP-262**] Natural England's Written Representation paragraphs 5.1.14, 5.1.16 and 8.1.5 [**REP1-262**] Environmental Masterplan [**REP4-124**, **REP3-098**, **REP2-018**, **APP-162**, **REP4-127**, **REP4-129**, **REP2-024** **to** **REP2-031]**	
Compensation	2.1.65 RRE	Natural England has advised that the Applicant should clearly identify which land is specifically compensating for SSSI loss within the ES, to ensure its protection into the future. Given the recently identified error in the publicly available SSSI digital mapping (as detailed in 2.1.104) Natural England has advised that the Technical Note	The ES has been updated to differentiate between SSSI compensation and ancient woodland compensation. This was presented to Natural England in a meeting on 13 July 2022 and is reflected in ES Chapter 8: Terrestrial Biodiversity. A technical note on this matter was shared with Natural England on 01 June 2023 (Annex C.9). As detailed in item	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Comments on Written Representations [**REP2-046**]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		(Annex C.9) and accompanying plan detailing the SSSI compensation areas should be updated to reflect the changes in SSSI area now impacted.	2.1.104, there were some boundary mapping errors within the publicly available digital datasets for the Shorne and Ashenbank Woods SSSI which have been responded to in the Applicant's comments on Written Representations. The Applicant will include the plan included at Annex C.16 of this document in the oLEMP at Deadline 7.		
Birds					
Impacts	2.1.66 RRE	Natural England has advised that sensitive periods for overwintering and breeding birds associated with the designated sites (SPA, Ramsar and SSSI) should be avoided. Natural England welcomes the provision of measures to mitigate for impacts to the Thames Estuary and Marshes SPA and Ramsar site, but nonetheless remains particularly concerned around where avoidance of one season (e.g. SPA) may introduce a consequential disturbance pathway into another (e.g. SSSI). It is Natural England's opinion that the impacts to the SSSI arising from visual and audible disturbance have not been robustly assessed.	REAC commitments HR001 'Seasonal constraints to construction of discharge from construction of South Portal' and HR002 'Seasonal constraints to works at the northern tunnel entrance compound drainage pipeline and outfall' both reference undertaking works in April, May, June and July to avoiding disturbance to passage and overwintering birds. The seasonal constraint is specific to the overwintering bird features of the SPA Ramsar as mitigation in the HRA. ES Chapter 8: Terrestrial Biodiversity assesses impacts on breeding birds and has concluded no significant effects and so no seasonal constraint mitigation is required.	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] ES Chapter 8: Terrestrial Biodiversity [**APP-146**] ES Appendix 2.2: CoCP [**REP6-038**]	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		Whilst some mitigation measures are provided for breeding birds (not associated with the South Thames Estuary and Marshes SSSI), they do not address the likely impacts of increased visual and audible disturbance upon the breeding bird features of the SSSI. It is Natural England's opinion that these impacts should be robustly considered, and avoidance/mitigation measures provided where necessary.	The Applicant continues to discuss this matter with Natural England, including at a meeting on 15 November 2023.		
Impacts	2.1.67	Natural England advised it wished to understand impacts to breeding, passage and wintering birds in the context of its SSSI scoping study, in particular, the proposal to upgrade the footpath between Coalhouse Fort and Bowaters Battery to a bridleway. Several meetings have been held to discuss these proposals in the context of Natural England's SSSI scoping study. Natural England does not support these proposals due to the presence of breeding bird species sensitive to disturbance. Upgrade works, for example habitat clearance and surfacing, would be likely to result in disturbance, as would increased usage of the route through the operational phase.	Thurrock Council requested the upgrade of the section of Footpath 200 to a bridleway to provide a connection between Bridleway 187 at Coalhouse Fort and Bridleway 58. This is detailed in the SoCG with Thurrock Council. Several meetings have been held to discuss this proposal in the context of Natural England's SSSI scoping study. Potential impacts from habitat loss and disturbance to birds have been identified within ES Chapter 8: Terrestrial Biodiversity. Following this concern raised by Natural England, it is considered that the mitigation design for habitat creation immediately north of Bowaters Sluice can be refined to provide additional contiguous scrub habitat which would offset the small	SoCG between National Highways and Thurrock Council [**REP6-030**] ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Natural England's Written Representation paragraphs 7.1.8 and 7.3.5 – 7.3.7 [**REP1-262**]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		Constructive discussions on this matter are ongoing, and Natural England's aim is for this matter to be resolved before or as part of the examination process.	amount of loss and potential disturbance as a result of the footpath upgrade. Constructive discussions on this matter are ongoing, and the Applicant issued a technical note to Natural England on this matter on 21st July 2023 (Annex C.15). Both parties expect this matter to be resolved as part of the examination process.		
Mitigation	2.1.68 RRE	Timing restrictions should be in place to ensure activities resulting in significant disturbance are undertaken outside sensitive periods of the year. This requirement should be included as part of the overall mitigation measures. Where, despite best efforts, this is not possible, additional mitigation measures may be required.	The appropriate timing of works to minimise adverse effects on ecology is a mitigation measure included in Section 8.6 of ES Chapter 8: Terrestrial Biodiversity. REAC commitment TB004 'Breeding birds' (ES Appendix 2.2: CoCP) commits to timing vegetation clearance and structure removal outside the bird nesting season wherever possible. The protected species licences also provide detail on the timing of works to avoid key sensitive periods within species life cycles. REAC commitment TB014 'Natural England licences' commits to '*All required Natural England licences and associated working practices and method statements* [being] *in place prior to any related construction works starting in areas where licensable species occur*.'	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] ES Appendix 2.2: CoCP [**REP6-038**]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Protected species licensing					
Protected species licensing	2.1.69	Natural England agrees with the Applicant's approach of drafting one Protected Species Licence per receptor, which covers the whole Project.	Noted.	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Agreed
Badgers	2.1.70	Natural England agreed the Letter of No Impediment (LoNI) for badgers on 31 March 2023.	A LONI for badgers was received on 31 March 2023.	ES Chapter 8: Terrestrial Biodiversity [APP-146] Natural England's Written Representation paragraph 9.6.1 [REP1-262]	Matter Agreed
Bats	2.1.71 RRE	Natural England and the Applicant have discussed the impact assessment and mitigation strategy for bats to support the draft application for a protected species licence. Natural England is supportive of the approach proposed by the Applicant, although a LONI would not be issued until the final draft application has been reviewed by Natural England.	The Applicant submitted an updated draft application in November 2022, and Natural England responded to request further information. Further meetings were held in April and May, and the updated application was submitted in July 2023.	ES Chapter 8: Terrestrial Biodiversity [APP-146] Natural England's Written Representation paragraph 9.2.1 [REP1-262]	Matter Under Discussion
Dormice	2.1.72 RRE	Consent has been provided by Natural England for works to enhance habitats for dormice in Shorne Woods Country Park (as part of Shorne and Ashenbank Woods SSSI).	The Applicant notes that consent for works to enhance habitats for dormice in Shorne Woods Country Park has been provided by Natural England to the landowner.	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
				Natural England's Written Representation paragraphs 9.3.1 and 9.3.2 [REP1-262]	
Dormice	2.1.73	Natural England and the Applicant have discussed the impact assessment and mitigation strategy for dormice to support the draft application for a protected species licence. Natural England is supportive of the approach proposed by the Applicant, although a LONI would not be issued until the final draft application has been reviewed by Natural England.	The Applicant submitted an updated draft application in November 2022, and Natural England responded to request further information. Further meetings were held in April and May, and the updated application was submitted in June 2023.	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Under Discussion
Great crested newts	2.1.74 RRE	Natural England agreed the Letter of No Impediment (LoNI) for great crested newts on 30 June 2023.	A LoNI for great crested newts was received on 30 June 2023.	ES Chapter 8: Terrestrial Biodiversity [APP-146] Natural England's Written Representation paragraph 9.4.1 [REP1-262]	Matter Agreed
Water voles	2.1.75 RRE	Natural England and the Applicant have discussed the impact assessment and mitigation strategy for water voles to support the draft application for a protected	The Applicant submitted an updated draft application in November 2022, and Natural England responded to request further information. A further meeting	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		species licence. Natural England is supportive of the approach proposed by the Applicant, subject to effective mink control, although a LONI would not be issued until the final draft application has been reviewed by Natural England.	was held in April, and the updated application was submitted to Natural England in May 2023.	Natural England's Written Representation paragraphs 9.5.1 and 9.5.2 [REP1-262]	
Water vole mitigation	2.1.76	Natural England's view was that the proposed water vole mitigation at Coalhouse Point was not appropriate due to the poor condition of the sea wall. Natural England welcomes the relocation of this water vole mitigation to an alternative site in the Mardyke catchment.	Following engagement with Natural England and the Environment Agency, the water vole mitigation has been moved from Coalhouse Point to an alternative site in the Mardyke Catchment.	ES Chapter 8: Terrestrial Biodiversity [APP-146]	Matter Agreed
Marine biodiversity					
Impacts	2.1.77	The originally proposed works for the East Tilbury Jetty would have impacted on land functionally linked to the Thames Estuary and Marshes SPA/Ramsar. There were also potential impacts on the SPA/ Ramsar from impact pathways such as noise, lighting and pollution. Natural England welcomes the removal of the East Tilbury Jetty from the Order Limits.	The East Tilbury Jetty has been removed from the Order Limits.	N/A	Matter Agreed
Impacts	2.1.78	Natural England had advised that any existing obligations regarding monitoring of the East Tilbury Jetty specified in the	The East Tilbury Jetty has been removed from the Order Limits.	N/A	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		existing planning application and marine licence should be adhered to. Natural England agrees that this comment is superseded and welcomes the removal of the East Tilbury Jetty from the Order Limits.			
Geology and soils					
Agricultural Land Classification					
Methodology	2.1.79	The Agricultural Land Classification Assessment Methodology has been agreed with Natural England	Methodology agreed.	ES Chapter 10: Geology and Soils [APP-148)	Matter Agreed
Population and human health					
WCH	2.1.80	Natural England has advised that any diversions of WCH routes should not degrade the experience of users and the connectivity of the Public Right of Way network. Natural England is continuing to have constructive and helpful discussions with the Applicant regarding the WCH network and its integration with the green bridges at Thong Lane South and Brewers Road as detailed in 2.1.35. Natural England also notes 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	The Design Principles state that all severed WCH routes would be re-linked across the Project unless better quality routes can be provided in the vicinity, the route can be rationalised to better link communities with the places they want to go, or re-aligned routes provide better connectivity into the existing WCH network. Consideration has been given to the experience of users and maintaining connectivity with the creation of pleasant routes between Shorne Woods Country Park, Ashenbank Wood and Jeskyns Community Woodland linked with existing routes from Gravesend (Design Principle PEO.09 'WCHs south of the Thames'). Public	Design Principles [REP6-046] Environmental Statement Addendum [REP6-054] Natural England's Written Representation paragraph 11.1.5 [REP1-262]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		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. Natural England has provided its comments on the Addendum to the ES (REP-181) within their Deadline 2 Response (REP2-090) and have sought further clarity on the nature and scale of any impact from recreational activities associated with the scheme to the Shorne and Ashenbank Woods SSSI. We are awaiting the updated assessment of potential impacts from increased recreational activity within the SSSI, including the proposed car park at Thong Lane and the diversion of the national cycle route through Ashebank Woods (which is not dependent upon the Thong Lane car park). We understand the Applicant is proposing to formally withdraw the Thong Lane car park at Deadline 7 and will update our advice accordingly.	Rights of Way NS167 and NS169 would be integrated into a new circular WCH route connecting around the A2/Lower Thames Crossing junction. Between Claylane Wood and Shorne Woods Country Park, this would be via the new green bridge at Thong Lane. The Applicant continues to have constructive discussions with Natural England regarding Thong Lane South and Brewers Road green bridges as detailed in item 2.1.35. The Applicant provided Natural England with a technical note to correct the omission in the ES regarding Public Rights of Way in Shorne and Ashenbank Woods on 7 July 2023 (Annex C.14). This report was submitted at Examination Deadline 1 as Appendix A 'Recreational Pressure on Designated Sites' to the Addendum to the ES. Following engagement with Natural England and other stakeholders, the Applicant has taken the decision to remove the Thong Lane Car Park from the Project. This will be reflected at Deadline 7.		
WCH	2.1.81	Natural England supports the upgrading of WCH routes and the proposal to reinstate any Public Rights of Way affected by the proposal, with the exception of item 2.1.67	The Applicant welcomes Natural England's support and acknowledges ongoing discussions regarding item 2.1.67.	ES Chapter 13: Population and Human Health [APP-151]	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		relating to the upgrade of the footpath between Coalhouse Fort and Bowaters Battery to a bridleway.			
WCH	2.1.101 (DL2) RRN	Where developments, such as the Lower Thames Crossing, affect the England Coast Path, the National Trail should be protected and enhanced with any changes to the route requiring a Variation Report approved by the Secretary of State. It is unclear from document 6.1 Environmental Statement Chapter 13 – Population and Human Health and accompanying appendices, how the impacts to the England Coast Path have been fully mitigated during both the construction and operational phases of the project. During the construction and operational phases, the connectivity of the National Trail should be maintained. Any temporary route suggested should also be suitable (safe and accessible) for significant pedestrian traffic. As confirmed in Natural England's Deadline 3 submission, this matter is now agreed.	A section of the existing route of the England Coast Path (this section is referred to locally as the Two Forts Way or Footpath 146) will have its surface improved, be widened and be designated as a pedestrian-cycle track in readiness for similar future improvements (by others) to the west and east, as detailed in 7.5 Design Principles S9.19; and 7.4 Project Design Report – Part E – Design for Walkers, Cyclists and Horse Riders. The route would be subject to a temporary closure for a period of less than one month to allow for this section of the route to be upgraded. This is assessed as having a neutral effect in Table 13.66 of ES Chapter 13: Population and Human Health.	Design Principles [REP6-046] 7.4 Project Design Report – Part E – Design for Walkers, Cyclists and Horse Riders [APP-512] ES Chapter 13: Population and Human Health [APP-151] Natural England's Written Representation paragraph 11.1.4 [REP1-262]	Matter Agreed
Road drainage and water environment					
Ground Investigation					
Methodology	2.1.82	The ground investigation methodology has been agreed with Natural England.	Methodology agreed	ES Chapter 14: Road Drainage and the Water	Matter Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
				Environment [APP-152]	
Hydrogeology					
Methodology	2.1.83	The hydrogeology methodology has been agreed with Natural England.	Methodology agreed	ES Chapter 14: Road Drainage and the Water Environment [APP-152]	Matter Agreed
Drainage					
Impact	2.1.84	Natural England was concerned that no confirmation appeared to have been provided that the existing sewer facilities have capacity to accommodate discharges from welfare facilities at the North Portal. However, Natural England agrees that this comment is superseded and that REAC commitment RDWE005 is appropriate.	REAC commitment RDWE005 (ES Appendix 2.2: CoCP) 'Construction water management', states that '*Wastewater generated from the compound welfare facilities would be discharged to sewer, subject to the agreements with the utility providers, or in locations where a sewer connection is not reasonably practicable, collected and taken off site by tanker for disposal at a licensed treatment facility*'.	ES Chapter 14: Road Drainage and the Water Environment [APP-152] ES Appendix 2.2: CoCP [REP6-038]	Matter Agreed
Mitigation	2.1.85	Naturalistic edges to planting, using native, site-appropriate species should be created, for example around attenuation ponds and wetland areas, to avoid an overly engineered appearance.	Design Principle LSP.17 'Integration of infiltration basins and retention ponds' commits that '*Infiltration basins and retention ponds shall not appear utilitarian or urban and shall be designed to appear as naturalistic elements within the wider setting, that take account of existing topography, gradients and field boundaries. Planting shall be provided to soften edges where this is appropriate to the context.*'	Design Principles [REP6-046] Natural England's Written Representation paragraph 6.1.62 [REP1-262]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Cumulative effects					
Methodology	2.1.86	Impacts from transport and utilities works should be considered cumulatively.	Agreed. Transport and utilities works have been considered cumulatively.	ES Chapter 16: Cumulative Effects Assessment [APP-154]	Matter Agreed
Methodology	2.1.87	Natural England advised that the assessment of cumulative effects should include a review of the London Resort Nationally Significant Infrastructure Project on the Swanscombe Peninsula, given the potential for inter-project effects. Natural England notes the application was withdrawn by the applicant in March 2022, with the applicant stating their intention to submit a new application.	ES Chapter 16: Cumulative Effects Assessment, has considered the cumulative landscape and visual impacts of the London Resort.	ES Chapter 16: Cumulative Effects Assessment [APP-154]	Matter Agreed
HRA (Habitats Regulations Assessment)					
HRA Screening	2.1.88 RRE	Natural England is in agreement with the HRA screening conclusions, apart from items 2.1.89 on underwater noise and vibration and 2.1.91 relating to North Downs Woodland Special Area of Conservation (SAC) and Thames Estuary and Marshes SPA and Ramsar. Natural England is continuing to hold constructive discussions with the Applicant on these matters.	The Applicant welcomes Natural England's agreement with HRA screening conclusions and continues to engage on SoCG items 2.1.89 and 2.1.91.	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [APP-487 and APP-488]	Matter Agreed*
HRA Screening	2.1.89 RRE	Natural England advises that the effects of underwater noise and vibration on SPA	Underwater noise and vibration have been modelled and assessed within ES	Habitats Regulations	Matter Not Agreed

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		birds that feed underwater should not be screened out at the LSE stage, as it considers the detail of this matter is more appropriately addressed at the appropriate assessment stage. Natural England does, however, advise that an adverse effect on integrity seems unlikely, based on its review of the information in the HRA Report Screening Report and Environmental Statement. Natural England will continue to advise on this matter as part of its ongoing advice on the HRA.	Chapter 9: Marine Biodiversity. The assessment shows that there is no pathway to an effect as the level of additional noise generated by the tunnel boring machine would be less than the background noise, and is therefore imperceptible. It is therefore the case that irrespective of the sensitivity of birds or their prey, there could be no LSE. The Applicant has discussed this matter with Natural England and continues constructive engagement, including sharing a technical note on 05 April 2023 (Annex C.8) and additional written advice on 24 April 2023. A workshop was held on 06 September 2023 with Natural England's ornithologist to discuss this matter further. Both parties agree that adverse effects on site integrity from underwater noise and vibration can be discounted and therefore there are no implications on consenting of the DCO from an HRA perspective. However, the Applicant does not agree that the presentation of this procedurally should be at Stage 2 Appropriate Assessment. The Applicant maintains its position that the issue is rightly addressed at Stage 1 Screening.	Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] ES Chapter 9: Marine Biodiversity [**APP-147**]	

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
HRA Screening	2.1.90 RRE	Natural England has sought confirmation that the LTC traffic model builds in the same data for in-combination development as Local Authorities use for their Local Plan allocation planning. Natural England issued a further advisory note to the Applicant on this matter on 11 April 2023 and in their Deadline 5 submission. Natural England considers the Applicant's approach does not recognise the local importance of defined local plan allocations and that it is not clear that the local growth factors reflect potentially greater-than-national-average predicted growth in the south-east. However, it is accepted that the model includes some in-combination traffic growth, though is not as precautionary as required under the habitats Regulations. Natural England has also sought clarification as to how in-combination developments were identified and screened in/out of the assessment (including any agricultural developments).	The Project traffic model builds in the same data for in-combination assessment that local authorities use. However, only committed developments are geographically assigned in the Project's traffic modelling. Other developments (for example those proposed in a Local Plan which haven't been consented) are accounted for by the growth factors supplied by government. The Applicant provided Natural England with a technical note confirming that additional traffic is accounted for within the assessment methodology. Natural England subsequently issued an advisory note to the Applicant on 11 April 2023. The Applicant has reviewed this note, and provided a response to Natural England on 30 June 2023, (Annex C.12). The Applicant maintains the position provided in this response and contends that it is appropriate and robust. The Applicant has submitted a response to Natural England's Deadline 5 submission at Deadline 6. Subsequently, the Applicant has issued a further technical note 'The precautionary nature of the in-combination assessment of air quality effects in the HRA' (Annex C.18) for discussion at a meeting scheduled on	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] Natural England's Written Representation paragraphs 4.1.48 – 4.1.57 [**REP1-262**]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			16th November with the aim of reaching agreement on this matter. The Applicant maintains that the traffic in-combination assessment is robust and sufficiently precautionary for the purposes of HRA.		
HRA Screening	2.1.91 RRE	Natural England sought clarification from specialists on the use of inconsequential nitrogen oxide (Nox) in the methodology for modelling nitrogen deposition, and issued an advisory note on this matter to the Applicant on 11 April 2023. Natural England provided further advice in their Deadline 5 Submission [**REP5-109**] in response to National Highways Deadline 2 Submission – 9.57 Without prejudice assessment of the air quality effects on European Sites following Natural England advice [REP2-068]. This information and results of the full AQ assessment (including the extent of ammonia, Nox and Ndep impacts at the protected sites) were not available to Natural England prior to the Without Prejudice assessment at Deadline 2 (3 August 2023) Natural England does not agree that a likely significant effect on North Downs Woodland can be ruled out as NH3 emissions alone would exceed 1% of a CL of 1µg/m3 and they have outstanding concerns relating to the methodology for	The conclusion of the assessment of North Downs Woodlands SAC in the HRA is that there would be no LSE on the basis that the additional Nox value is inconsequential and so no nitrogen deposition modelling is generated. The SAC therefore does not exceed any thresholds and North Downs Woodlands SAC therefore has been appropriately screened out at Stage 1 HRA. The Applicant has reviewed an advisory note received from Natural England on 11 April 2023 and provided a response to Natural England on 30 June 2023 (Annex C.12). The Applicant also issued a 'Without prejudice assessment of the air quality effects on European sites following Natural England advice' at Deadline 2. The Applicant has submitted a response to Natural England's Deadline 5 submission at Deadline 6. In that response the Applicant has committed to submitting an update to the HRA at Deadline 8 (on a not without prejudice	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] Without prejudice assessment of the air quality effects on European sites following Natural England advice [**REP2-068**] Natural England's Written Representation paragraphs	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		traffic modelling for in combination assessment as referenced in 2.1.90 and has therefore advised that an appropriate assessment is required. Natural England also disagrees that a Likely Significant Effect at Thames Estuary and Marshes Ramsar site and SPA can be excluded for NH3 and Ndep (>1% of the critical level and critical load respectively arising from construction traffic from the project alone and in combination) and has therefore advised that an appropriate assessment is required for these two pollutants as well as Nox. The concerns relating to the methodology for traffic modelling for in combination assessment as referenced in 2.1.90 apply.	basis) that includes a number of Natural England's Deadline 5 recommendations. Both parties continue to engage constructively, including at a meeting held on 8 November 2023, with the aim of reaching agreement on this matter.	4.1.18–4.1.47 [**REP1-262**]	
HRA AA	2.1.92 RRE	Natural England agrees with the Appropriate Assessment conclusions, with the exception of those relating to air quality (see SoCG items 2.1.94 and 2.1.95), and the feasibility of the wetland at Coalhouse Point (see SoCG item 2.1.93). Natural England is continuing to hold constructive discussions with the Applicant on these matters.	The Applicant welcomes Natural England's agreement with the Appropriate Assessment conclusions and continues constructive discussions on SoCG items 2.1.93 and 2.1.95.	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**]	Matter Agreed*
HRA AA	2.1.93 RRE	Natural England agrees that the functionally linked land mitigation at Coalhouse Point is feasible and would	The wetland habitat at Coalhouse Point has been secured in REAC commitments HR010 'Habitat	Habitats Regulations Assessment –	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		provide appropriate mitigation in principle. Natural England sought clarity from specialists about the wording of the proposed REAC commitments HR010 and HR011 in relation to the necessary supply of water from the Thames for wetland creation, and provided further advice to the Applicant on 09 February 2023, 24 May 2023 and 6 September 2023. Natural England is confident that agreement on this matter can be achieved within Examination timeframes. Natural England has reviewed the technical note shared by the Applicant on 11 October 2023 (Annex C.17), and provided comments on 3rd November 2023, noting that good progress has been made on this matter. A further meeting is proposed shortly to reach final agreement	enhancement in functionally linked land' and HR011 'Constraints to works to form the water inlet with self-regulating valve' which secure the water supply before the commencement of construction. The Applicant issued a technical note to Natural England on 20 July 2022 to outline the proposals for this water supply, and provided a further update on 24 February 2023. Both parties continue constructive engagement on this matter, and attended a site visit on 20 April 2023. The Applicant issued a more detailed technical note to Natural England on 30 June 2023 (Annex C.13) and discussed this with Natural England's ornithologist at a workshop on 06 September 2023. The Applicant has shared a technical note with Natural England on 11 October 2023 to demonstrate the deliverability of the mitigation (Annex C.17). Natural England responded to this technical note on 3 November 2023, raising a number of technical issues. The Applicant has submitted a number of amendments to the oLEMP at Deadline 7 in response to Natural England's advice. This matter will be discussed further at a meeting on 10 November 2023.	Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] ES Appendix 2.2: CoCP [**REP6-038**] Natural England's Written Representation paragraphs 4.2.1 – 4.2.15 [**REP1-262**]	

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
HRA AA	2.1.94 RRE	Natural England does not agree with the conclusion of no adverse effects on Epping Forest SAC, and has advised that mitigation is required. Natural England has advised the conservation objective is to 'restore' the site to below its relevant critical levels or loads, and that the proposed development would increase nitrogen deposition further above the relevant critical load. Natural England therefore considers the proposed development, without mitigation, would have an adverse effect on the integrity of the site. Following constructive discussions with Natural England, the Applicant has identified mitigation (a 4-year speed limit) that, if provided, the applicant believes would reduce emissions to those without the project (DM scenario). In response to Examiners questions 1 Q11.11.1 and based on information provided in National Highways Deadline 2 Submission – 9.57 Without prejudice assessment of the air quality effects on European Sites following Natural England advice [**REP2-068**], Natural England advised in their Deadline 5 Submission [**REP5-109**] that whilst the form of mitigation identified is agreed and that they believed the 4 year duration was justified	The Applicant has concluded that there would be no adverse effects on the integrity of the Epping Forest SAC on account of the short duration of effect on Epping Forest (four years), the small proportion of the site affected (0.02% of the whole SAC and 0.17% of the feature habitat within the SAC), and the absence of any nitrogen sensitive species identified during surveys. In order to demonstrate that due regard has been had to the advice of Natural England, the Applicant has considered, on a 'without prejudice' basis, mitigation in the form of a temporary speed limit reduction from 70mph to 60mph between junction 27 and 26 of the M25 in the westbound direction only. The Applicant's assessment has considered that the mitigation would be technically feasible, would have negligible traffic impacts and would reduce the extent of nitrogen deposition to a level which would enable Natural England to agree with a conclusion of no adverse effect on site integrity. Whilst mitigation in the form of a temporary speed limit reduction has been assessed to be effective, the Applicant does not propose to incorporate the measure as it would be	Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] Natural England's Written Representation paragraphs 4.1.4 – 4.1.17 [**REP1-262**]	Matter Not Agreed (but Natural England would agree with the HRA conclusions for this site if the identified mitigation was implemented in an enforceable manner)

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		based on the information provided for NOx that there was no equivalent evidence provided for NH_3. Information on the extent of NH3 emitted by the project, and that a likely significant effect would arise, was not available at the time the mitigation was proposed. Natural England has suggested that monitoring of NOx and NH_3 (and calculations of Ndep) in accordance with a monitoring plan with a commitment to retain speed limit mitigation if concentrations remain above pre-operational values would likely be sufficient to overcome this concern. If this mitigation was implemented in an enforceable manner along with a suitable monitoring plan and commitments as aforementioned, Natural England would agree to the conclusion of no adverse effect on site integrity for Epping Forest SAC. Further assessment (appropriate assessment) is required for both North Downs Woodlands SAC and Thames Estuary and Marshes SPA and Ramsar. Natural England considers that it is possible that the modelled pollution at both sites would not result in AEOI, and therefore further mitigation would not be required, however, an AA has not been	unnecessary and accordingly has not relied upon it in concluding that the Project would not adversely affect the integrity of the Epping Forest SAC. The results of the Applicant's assessment have been included within Annex C.7 'Without prejudice consideration of mitigation for air quality effects on Epping Forest SAC' so that this information is before the Examining Authority and Secretary of State in examining the application and in deciding whether or not to grant development consent. The Applicant maintains its position that mitigation is not required and were it to be required it would not need to be monitored or extended. However, the 'Without prejudice consideration of mitigation for air quality effects on Epping Forest SAC' and Natural England's suggested amendment to it, are both before the Examining Authority and Secretary of State in examining the application and in deciding whether or not to grant development consent. In relation to the assessments on North Downs Woodland SAC and Thames Estuary and Marshes SPA, and as detailed in item 2.1.91, the Applicant has		

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		undertaken for all relevant pollutants and the full spatial extent of impact at the sites is not yet determined. Natural England's concerns relating to the methodology for traffic modelling for in combination assessment as referenced in 2.1.90 are also relevant.	submitted a response to Natural England's Deadline 5 submission at Deadline 6. In that response the Applicant has committed to submitting an update to the HRA at Deadline 8 (on a not without prejudice basis) that includes a number of Natural England's Deadline 5 recommendations. Both parties continue to engage constructively, including at a meeting held on 8 November 2023, with the aim of reaching agreement on this matter.		
HRA Screening	2.1.95	Natural England welcomes the inclusion of ammonia modelling in the air quality assessment of nitrogen deposition. Natural England is continuing to have constructive discussions on the assessment of ammonia, and issued an advisory note to the Applicant on 11 April 2023. Natural England is confident that agreement on this matter can be achieved within Examination timeframes. As outlined in 2.1.91, Natural England has concerns that the critical level used by the applicant at North Downs Woodland SAC is not precautionary, and that ammonia has not been considered for Thames Estuary and Marshes Ramsar site/ SPA but the applicant has indicated this will be included in the revised report. Natural	Following engagement with Natural England on this matter, ammonia modelling has been included in the air quality assessment. The Applicant has engaged extensively on the methodology for assessing ammonia within the HRA and continues constructive engagement with Natural England. The Applicant has reviewed an advisory note received from Natural England on 11 April 2023 and provided a response to Natural England on 30 June 2023 (Annex C.12). As detailed in item 2.1.91, the Applicant has submitted a response to Natural England's Deadline 5 submission at Deadline 6. In that response the Applicant has committed to submitting an update to the HRA at Deadline 8 (on a	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
		England awaits this revised assessment in the HRA report.	not without prejudice basis) that includes a number of Natural England's Deadline 5 recommendations. Both parties continue to engage constructively, including at a meeting held on 8 November 2023, with the aim of reaching agreement on this matter.		
Nitrogen deposition					
Methodology	2.1.96	Natural England agrees with the Applicant's EIA nitrogen deposition methodology, subject to reviewing the final assessment.	The Applicant welcomes Natural England's agreement on this matter.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**] Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment [**APP-487** and **APP-488**] Natural England's Written Representation paragraphs 4.1.58 – 4.1.59 [**REP1-262**]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Mitigation	2.1.97	Natural England agrees with the methodology for assessing potential mitigation measures for nitrogen deposition impacts on national and locally designated sites and ancient woodland, which include speed enforcement and speed limits.	The Applicant welcomes Natural England's agreement to the methodology for assessing potential mitigation measures for nitrogen deposition impacts on national and locally designated sites and ancient woodland. Note discussions in relation to the assessment of mitigation of nitrogen deposition for the HRA detailed in SoCG item 2.1.94.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**]	Matter Agreed*
Compensation	2.1.98 RRE	Natural England supports the Applicant's approach to nitrogen deposition compensation for SSSIs, ancient woodland, Local Wildlife Sites and veteran trees, subject to reviewing the results of the final assessment. Natural England also agrees with the principles underpinning the nitrogen deposition habitat creation being provided as compensation, which include building resilience and improving connectivity at a landscape scale. Natural England's advice (see also item 2.1.62) has been provided in the context that, should the scheme be approved, the compensation areas will be a necessary part of the package of measures needed to address the impacts from nitrogen deposition on these sites.	The Applicant welcomes Natural England's broad support for the habitat creation proposals.	ES Chapter 8: Terrestrial Biodiversity [**APP-146**]	Matter Agreed*
Compensation	2.1.99 RRE	Natural England agrees with the oLEMP management requirements relating to nitrogen deposition compensation land, subject to minor refinements, and ongoing engagement through to detailed design.	The Applicant welcomes the agreement from Natural England and will continue constructive engagement through to detailed design.	Outline Landscape and Ecology Management Plan [**REP4-140**]	Matter Agreed*

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
Compensation	2.1.100	Natural England agrees that the oLEMP advisory group, and its precursor, are appropriate forums to develop the design of the nitrogen deposition compensation land.	The Applicant has committed to use the oLEMP advisory group, and its precursor, to develop the design of nitrogen deposition compensation land.	Outline Landscape and Ecology Management Plan [REP4-140]	Matter Agreed
Compensation	2.1.107 WR (DL5)	Natural England notes that the Applicant has recently completed a Minor Refinements Statutory Consultation which proposes to reduce the area of compensatory planting in the Burham and Blue Bell Hill areas. It is unclear whether the Applicant proposes to amend their impact assessment as a result of this reduction in habitat provision as this may alter the assessment of beneficial effects. We therefore recommend that clarity is provided by the Applicant on the status of the Minor Refinements consultation and any implications this has for the submitted documents.	A 70ha site (Blue Bell Hill) and a 10ha site (Burham) were originally included as part of the proposed nitrogen deposition compensation package. However, ongoing engagement with the landowner of the sites highlighted new information about the implications of the proposals on the farm business, and a newly agreed Countryside Stewardship Scheme. As part of the initial site selection process for NDep compensation, sites with a significant ecological value (for example land in Countryside Stewardship Schemes) were discounted. In response, the Applicant identified an opportunity to make modifications to the Burham (Works No. E2) and Blue Bell Hill (Works No. E1) nitrogen deposition compensation sites to reduce the amount of land to be taken while still providing sufficient compensation. No new or different likely significant adverse effects are anticipated to result from these changes during either construction or operation. Following a public consultation, the Applicant submitted a change application on 2 August 2023 to remove the Burham	Lower Thames Crossing Notification of Proposed Changes to the Planning Inspectorate [AS-083] Natural England's Written Representation paragraph 6.1.15 REP1-262] First Change Application [CR1-002]	Matter Under Discussion

Topic	Item No.	Natural England Comment	The Applicant's Response	Application Document Reference	Status
			site from the Order Limits, and to reduce the Blue Bell Hill site by 29ha. A procedural decision to accept the change into the examination was received on 29 August 2023. The area of significantly affected habitat across the Project would be 176.4ha and the total area of compensation is 205ha following these changes. This represents a comparable and appropriate level of compensation. The retained 43ha at Blue Bell Hill is the land which maximises the ecological connectivity, and therefore the Blue Bell Hill site continues to provide a robust ecological connection to existing woodland and therefore its nitrogen deposition compensation function. Due to this substantial area of proposed new woodland habitat remaining in the reduced Order Limits, the significant beneficial landscape effect on the Mid Kent Downs (sub area Bredhurst) during operation would remain, as reported in the first Change Application. The first Change Application also reports a beneficial visual effect at representative viewpoint NDep-RV-08, although this would no longer be considered significant due to the proposed reduction in the area of new woodland habitat and therefore the extent of change to the existing view during operation.		

Appendix A Engagement activity

Table A.1 Engagement activities between the Applicant and Natural England since the DCO Application was submitted on 31 October 2022

Date	Overview of Engagement Activities
31 October 2022	Meeting with Natural England and Forestry England to discuss the planting proposals for Hole Farm
10 November 2022	Meeting with Natural England's Area Manager to discuss the likely timescales for DCO examination, to provide an update on SoCG matters and next steps and to discuss the proposed ecological mitigation site at Coalhouse Point.
16 November 2022	DCO walkthrough presentation to provide stakeholders a summary of where to find relevant DCO Application Documents.
16 November 2022	Meeting with Natural England and Forestry England to discuss the planting proposals for Hole Farm
22 November 2022	Fortnightly catch-up meeting to discuss the planting proposals for Hole Farm
24 November 2022	Meeting to discuss BNG scores.
25 November 2022	Stakeholder biodiversity and ecology briefing, including impact, mitigation and compensation proposals and the associated biodiversity value
30 November 2022	Meeting with Natural England and Forestry England to discuss the planting proposals for Hole Farm
06 December 2022	Fortnightly catch-up meeting to provide an update on actions.
15 December 2022	Meeting to discuss Natural England's Service Level Agreement
11 January 2023	SoCG workshop 58 to discuss the predicted examination timetable and for Natural England to provide updates on their potential SSSI update and their inconsequential NOx report.
12 January 2023	Meeting with Natural England's Area Manager to discuss Planning Inspectorate's Procedural Decision Note, the Service Level Agreement and nitrogen deposition compensation.
17 January 2023	Fortnightly catch-up meeting to discuss the focus of upcoming meetings, to reach agreement on as many SoCG items as possible., and to discuss PADS.
25 January 2023	SoCG workshop 59 to discuss invertebrates, green bridges and landscape impacts.
31 January 2023	Fortnightly catch-up meeting to discuss the schedule of meetings and to provide an update on actions.
08 February 2023	SoCG Workshop 60 to discuss acid grassland, road surfacing in the AONB and footpaths upgrades in designated sites.
09 February 2023	Meeting with Natural England's Area Manager to discuss Relevant Representations and PADS, to provide an update on the legacy and

Date	Overview of Engagement Activities
	benefits workstream and to discuss nitrogen deposition compensation and progressing SoCG items.
14 February 2023	Fortnightly catch-up meeting to discuss the programme of meetings, to provide an update on actions, and for Natural England to request clarifications on some elements of the DCO application.
28 February 2023	Meeting with Natural England to discuss their Relevant Representation response.
09 March 2023	Meeting with Natural England's Area Manager to discuss the SoCG and Natural England's Relevant Representation response, focussing on their potential SSSI notification and design development and ongoing management.
22 March 2023	SoCG Workshop 61 to discuss the Ministerial Statement from 09 March, likely timescales for SoCG authoring and the non-statutory public consultation.
28 March 2023	Fortnightly catch-up meeting to discuss Natural England's SSSI scoping study, timescales for the development of the SoCG, and to provide an update on SoCG matters including acid grassland and inconsequential NOx.
03 April 2023	Meeting with Natural England to discuss the Enovert receptor site.
05 April 2023	SoCG Workshop 62 to discuss M2/A2/A122 Lower Thames Crossing junction cross-sections, the assessment of underwater noise, and the request for seasonal constraints for works at Coalhouse Point.
06 April 2023	Meeting with Natural England to discuss the Thames Estuary SSSI scoping study
13 April 2023	Meeting to discuss the Stakeholder Landscape and Ecology Working Group in advance of the two workshops to be held on 17 April 2023 and 02 May 2023.
19 April 2023	SoCG Workshop 63 to discuss Natural England's potential SSSI notification, Natural England's air quality advice, underwater noise and Coalhouse Point seasonal constraints.
25 April 2023	Fortnightly catch-up meeting to discuss the non-statutory public consultation, the proposed ecological mitigation at Coalhouse Point and the proposed footpath upgrade to a bridleway at Bowaters Battery.
20 April 2023	Site visit to Coalhouse Point to discuss the proposed ecological mitigation site.
26 April 2023	Meeting to discuss Protected Species Licensing
02 May 2023	Stakeholder Landscape and Ecology Working Group
03 May 2023	SoCG Workshop 64 to discuss Planning Inspectorate's Rule 6 letter, ways of working, Natural England's potential SSSI notification, PFA and the proposed ecological mitigation at Coalhouse point.
09 May 2023	Fortnightly catch-up meeting to discuss the schedule of future meetings and to provide an update on actions.
10 May 2023	Meeting to discuss Protected Species Licensing

Date	Overview of Engagement Activities
17 May 2023	SoCG Workshop 65 to discuss the Project's minor refinement consultation, Natural England's potential SSSI notification, underwater noise, and upgrades to the Two Forts Way.
17 May 2023	Stakeholder briefing on the public consultation material.
23 May 2023	SoCG Workshop to discuss Natural England's potential SSSI notification
08 June 2023	Meeting with Natural England's Area Manager to discuss the DCO Examination timetable and Brewers Road and Thong Lane South green bridges.
14 June 2023	SoCG Workshop 66 to discuss Natural England's air quality technical note, the north portal discharge, the south portal drainage alignment, and to discuss the project's commitment to use PFA.
28 June 2023	SoCG Workshop 67 to discuss great crested newts, and to provide an update on a minor change to HRA Figure 24 regarding the location of noise attenuation measures.
4 July 2023	Fortnightly catch-up meeting to discuss the programme of future meetings, technical notes and drawings, and the SoCG.
4 July 2023	Joint meeting with Natural England and Enovert to discuss the reptile receptor site.
12 July 2023	SoCG Workshop 68 to produce a heat map to identify high priority areas for invertebrates.
18 July 2023	Fortnightly catch-up meeting to discuss the programme of future engagement
01 August 2023	Fortnightly catch-up meeting to discuss Natural England's Written Representation and the SoCG.
10 August 2023	Meeting with Natural England's Area Manager to discuss Written Representations, Deadline 2 Submissions and Protected Species Licensing.
15 August 2023	Fortnightly catch-up meeting to discuss the Environmental Masterplan
23 August 2023	SoCG Workshop 69 to discuss potential additional planting along Halfpence Lane, additional SoCG items, examination hearings and written questions.
29 August 2023	Fortnightly catch-up meeting to discuss the schedule of future meetings and the SoCG
06 September 2023	SoCG Workshop 70 to discuss underwater noise and Coalhouse Point with Natural England's ornithologist.
20 September 2023	SoCG Workshop 71 to discuss Natural England's comments in relation to the Thong Lane Car Park, and to discuss SoCG progress.
22 September 2023	Meeting with Natural England's Area Manager to discuss progress with technical matters and ways of working.
26 September 2023	Fortnightly catch-up meeting to discuss the schedule of future meetings and the SoCG

Date	Overview of Engagement Activities
04 October 2023	SoCG Workshop 72 to discuss invertebrate and HRA related SoCG matters.
10 October 2023	Fortnightly catch-up meeting to discuss the schedule of future meetings and the SoCG
12 October 2023	Meeting with Natural England's Area Manager to discuss Natural England's Deadline 5 submissions.
18 October 2023	SoCG Workshop 73 to discuss the SoCG programme.
24 October 2023	Fortnightly catch-up meeting to discuss landscape related SoCG matters.
26 October 2023	Air quality workshop with Natural England to discuss their Deadline 5 submissions.

Appendix B Glossary

Term	Abbreviation	Explanation
Appropriate Assessment	AA	An assessment in accordance with stage 2 of the HRA.
Area of Outstanding Natural Beauty	AONB	Statutory designation intended to conserve and enhance the ecology, natural heritage and landscape value of an area of countryside
Biodiversity Net Gain	BNG	Ecological enhancements introduced by the Project which leave the natural environment and the number of species present in it, in a measurably better state than before construction.
Decibels	dB	The unit of measurement used for sound pressure levels and noise levels.
Department of Environment Food and Rural Affairs	Defra	The government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom of Great Britain and Northern Ireland.
Development Consent Order	DCO	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.
Environmental Impact Assessment	EIA	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. For certain projects, EIA is a statutory requirement, reported an ES.
Environmental Management Plan	EMP	For the Project, a plan setting out the conclusions and actions needed to manage environmental effects as defined by the Design Manual for Roads and Bridges standard LA 120. The Code of Construction Practice is the equivalent of the first iteration of the EMP (EMP1). The contractor's EMP would be EMP2 and the end of construction EMP would be EMP3.
Environmental Statement	ES	A document produced to support an application for development consent that is subject to EIA, which sets out the likely impacts on the environment arising from the proposed development.
Geographic Information System	GIS	An integrated collection of computer software and data used to view and manage information about geographic places, analyse spatial relationships and model spatial processes.
Habitats Regulations Assessment	HRA	A tool developed by the European Commission to help competent authorities (as defined in the Habitats Regulations) to carry out assessment to ensure that a project, plan or policy will not have an adverse effect on the integrity of any Natura 2000 or European sites (Special Areas of Conservation, Special Protection

Term	Abbreviation	Explanation
		Areas and Ramsar sites), either in isolation or in combination with other plans and projects, and to begin to identify appropriate mitigation strategies where such effects were identified.
Hectares	Ha	The hectare is an SI unit of area primarily used in the measurement of land as a metric replacement for the imperial acre. An acre is about 0.405ha and 1ha is about 2.47 acres.
Ingrebourne Valley Limited	IVL	A leading land reclamation and restoration company in the south-east of England
Landscape and Ecology Management Plan	LEMP	A document which provides details on the delivery and management of the landscape and ecology elements identified in the Environmental Masterplan for the Project, including their success criteria.
Letter of No Impediment	LoNI	Letter of No Impediment
Likely Significant Effect	LSE	Likely Significant Effect
Lower Thames Crossing	LTC	Lower Thames Crossing
National Policy Statement for National Networks	NPSNN	The NPSNN sets out the need for, and Government's policies to deliver, development of Nationally Significant Infrastructure Projects on the national road and rail networks in England. It provides planning guidance for promoters of Nationally Significant Infrastructure Projects on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.
Nitrogen oxide	NOx	A group of seven gases and compounds composed of nitrogen and oxygen, sometimes collectively known as NOx gases.
Outline Landscape and Ecology Management Plan	oLEMP	A document which provides details on the delivery and management of the landscape and ecology elements identified in the Environmental Masterplan for the Project, including their success criteria.
Planning Inspectorate	PINS	An executive agency of the Department for Levelling Up, Housing and Communities. The Planning Inspectorate deals with planning appeals, national infrastructure planning applications, examinations of local plans and other planning-related and specialist casework in England and Wales.
Pulverised Fuel Ash	PFA	One of the coal combustion products, composed of the fine particles that are driven out of the boiler with the flue gases.

Term	Abbreviation	Explanation
Register of Environmental Actions and Commitments	REAC	The REAC identifies the environmental commitments that would be implemented during the construction and operational phases of the Project if the DCO is granted, and forms part of the Code of Construction Practice [REP1-157].
Stakeholder Actions and Commitments Register	SACR	Stakeholder Actions and Commitments Register
Site of Special Scientific Interest	SSSI	A conservation designation denoting an area of particular ecological or geological importance.
Special area of Conservation	SAC	A designation under EU Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the Habitats Directive.
Special Protection Area	SPA	A designation under EU Directive 2009/147/EC on the Conservation of Wild Birds.
Statement of Common Ground	SoCG	A Statement of Common Ground is a written statement containing factual information about the proposal which is the subject of the appeal that the appellant reasonably considers will not be disputed by the local planning authority.
Vehicle Restraint Systems	VRS	Vehicle Restraint Systems
Walkers, cyclists and horse riders	WCH	Walkers, cyclists and horse riders
Wildlife and Countryside Act 1981	WCA	This Act allows for the designation of SSSI due to features of conservation interest related to flora, fauna, physiography or geology and makes it an offence to kill, injure, take, possess or trade in many wild animal species and to pick, uproot, possess or trade in a number of wild plants.

Appendix C

Annex C.1 Natural England Statutory Consultation Response

Date: 19 December 2018
Our ref: 261571
Your ref: -

[redacted]
Highways England

[redacted]

By email only, no hard copy to follow

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

Dear [redacted]

Lower Thames Crossing
Preliminary Environmental Information Report

Thank you for your letter of the 10 October 2018 consulting Natural England on the Preliminary Environmental Information Report for the Lower Thames Crossing project.

Natural England has welcomed the positive, partnership approach with ourselves and other members of the Defra Family as the project has evolved and hopes this can continue as the project moves towards the submission stage. Our detailed advice in relation to the consultation is provided in Annex One appended to this letter.

Given the nature of the consultation, the limited information provided on the results of the environmental studies and the lack of a detailed impact assessment and mitigation/compensation measures our comments are, in the main, high-level. We will of course continue working with the Project Team and Highways England to ensure that, wherever possible, the avoidance, mitigation and compensation measures for biodiversity and landscape impacts within our remit can be agreed ahead of the Development Consent Order submission.

In addition, Natural England considers that there is significant scope for additional, visionary design and construction to ensure that the project can deliver an exemplar environmental net gain approach in accordance with the Government's 25 Year Environment Plan and approach for planning. There is a great opportunity for this development to be one of Highways England's first major projects to deliver net gain as you work towards all schemes achieving this standard as part of your environmental commitment. Again, Natural England would be pleased to work with you and the wider Defra Family and environmental stakeholder network to realise this ambition in the coming months.

The comments provided in this response are intended to provide feedback on the Preliminary Environmental Information Report specifically, but also we seek to provide further information on the opportunities presented by a project of this scale to achieve a lasting legacy for the environment in this area.

I trust these comments are helpful and we would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us. For any queries relating to the specific advice in this letter only please contact [redacted]. For any new consultations, or to provide further information on this consultation please send your correspondences to [redacted]

Yours sincerely

[redacted]

Sussex and Kent Team

Annex One: Natural England's detailed comments in relation to the Preliminary Environmental Information Report for the Lower Thames Crossing

1 General comments

1.1 Natural England welcomes the principle of the Preliminary Environmental Information Report (PEIR) to identify "the project's likely significant effects and the measures that are being considered to avoid and minimise them" (Page 1). The principles of the 'avoid, mitigate compensate' hierarchy are paramount for this project. We welcomed the work undertaken at the route selection stage with the preferred route avoiding direct impacts to statutory nature conservation sites and ancient woodland habitat. It is also appropriate to complement the mitigation hierarchy with environmental net gain as an additional policy requirement, and we advise that the DCO and its associated assessments should seek to audit each of these as distinct requirements.

1.2 Guidance from the Planning Inspectorate[1] states that:

'PEI [Preliminary Environmental Information] is defined in the EIA Regulations as: '*information referred to in Part 1 of Schedule 4 (information for inclusion in environmental statements) which:*

(a) has been compiled by the applicant; and
(b) is reasonably required to assess the environmental effects of the development (and of any associated development)

It also states that 'The focus of the PEI is to enable the local community to understand the environmental effects of the proposed development so as to inform their responses regarding the proposed development. This is reflected in the Department for Communities and Local Government (DCLG) Guidance which advises applicants to provide *'sufficient preliminary environmental information to enable consultees to develop an informed view of the project. The information required will be different for different types and sizes of projects and it may differ depending on the audience of a particular consultation… The key issue is that the information presented must provide clarity to all consultees'*

1.3 Based upon the information provided, and the guidance above Natural England does not consider that the PEIR contains sufficient information for us to provide detailed advice on the nature, scale and significance of the impacts to designated sites, protected landscapes, protected species and wider biodiversity at present. Similarly, we do not feel there is sufficient information for us to be able to provide in depth advice on the appropriateness or otherwise of the indicative mitigation and compensation measures.

1.4 We acknowledge that the route design has yet to be finalised but in the absence of more detailed information, supported by the results of the detailed studies Natural England's advice provided at this stage is necessarily limited in scope and detail. That said, Natural England remains committed to build upon the excellent partnership working approach with the project and colleagues from the Defra Family to ensure that, where possible, our continued working with the Project Team over the next few months ensures that the biodiversity and landscape impacts can be fully addressed ahead of the Development Consent Order submission. This is likely to require much greater levels of engagement over the coming months and we will of course be pleased to provide this on a cost recovery basis through the Discretionary Advice

[1] Screening, Scoping and Preliminary Environmental Informationhttps://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/07/Advice-note-7v3.pdf

Service contract.

1.5 We would recommend that the results of the ecological, landscape and access/recreational studies are fully embedded into the ongoing work to finalise the scheme design to ensure that the finalised route and detailed design is the least environmentally damaging, building upon the positive work undertaken at the preferred route selection stage. Such an approach is in accordance with the 'avoid, mitigate, compensate' hierarchy within the National Planning Policy Framework.

1.6 Given the scale of the development, it being one of the biggest transport infrastructure projects in the country, Natural England would expect the project to be an exemplar in sustainable development demonstrating how it is helping to achieve the outcomes within the Government's 25 Year Environment Plan. Natural England would be pleased to work with the Project Team and Highways England over the coming months to realise the ambition for this to be an exemplar project for delivering environmental net gain. The PEIR makes reference to enhancements but we do not consider they realise the ambitions of the Environment Plan for a scheme of this size.

1.7 We welcome the intention on page 6 to 'carry out environmental mitigation such as relocating protected species' as part of the enabling phase before main construction work begins We would highlight the need for any associated habitat creation works (whether for species or habitats) to be timetabled such as to allow sufficient maturation time in order for the habitats created to function effectively for target species, and/or to display sufficient functionality. The aim where possible should be to avoid the net loss of habitat availability at any given point in the project construction, moving to a position of long-term net gain, consistent with the direction of environmental policy. Any likely temporal shortfall in habitat availability may need to be taken into account through upscaling to offset that deficit.

1.8 The PEIR confirms the estimated construction timeframe of around six years. Whilst we recognise the necessity of a lengthy construction period for a major infrastructure project of this scale, it is noted that typically construction phase effects are shorter in duration, and for many species a six year period may represent several life cycles. We suggest that the associated impact assessments should consider whether the duration of the construction phase may translate into longer-term effects to some species, and whether any changes in distribution or behaviours may take longer to reverse than would typically be the case for otherwise temporary impacts. For example, it is possible that changes in overwintering bird distribution by the avoidance of foraging areas may become learned behaviours, beyond the completion of the construction phase.

1.9 The clear positioning of construction compound areas is welcomed and we agree that these should be scoped into impact assessments for the project as a whole. We welcome the proposed 'Code of Construction Practise' (CoCP) and its intention to include environmental best practice, which should include specific measures as required and informed by detailed surveys.

1.10 We note that a number of services and utilities are likely to need diversion or alteration as part of the project – it is not clear to us at this stage whether such actions are to be included within the scope of the project, or whether they will be separately assessed and consulted upon and it would be appreciated if clarity were provided.

1.11 Similarly, given the likely change in traffic flow through Kent with an increase in vehicle movements along the A2/M2 corridor once the Lower Thames Crossing is operational, any highway upgrade or junction improvements that will be required to facilitate the safe and effective operation of the A2/M2 between the Crossing and the channel ports should be considered within the Environmental Statement; at present no such assessment seems to be

proposed or included within the PEIR.

1.12 It may be appropriate to note for the avoidance of doubt, that the reference to 'priority habitat or species' at Table 9.2 (NPSNN paragraph number 4.25) should be distinguished from the Section 41 (of the Natural Environment and Rural Communities Act, 2006) habitats and species, although they are known by the same name.

1.13 At paragraph 9.4.1, it is proposed to 'describe the current ecological baseline and capture a moment in time against which the potential effects of the proposed development will be assessed'. It should be noted that several areas likely to be affected by the proposal benefit from permissions requiring nature conservation-led restoration and aftercare plans, which may either not have commenced, or which may partially or substantially complete during the construction period of the scheme. With this in mind, the Environmental Statement should consider the latent biodiversity potential such areas hold for enhanced biodiversity that the baseline studies might not otherwise detect. We will be pleased to expand on this point as required in our pre-application discussions. Similar comments apply to paragraphs 9.5.2 – 9.5.4 headed 'Future baseline conditions', where the ecological baseline may well change if this project were not undertaken.

2 Protected Landscapes

2.1 Natural England notes that the development boundary encompasses areas of the Kent Downs Area of Outstanding Natural Beauty (AONB). The proposal is that the A2, post-construction will be fourteen lanes wide (Table 8.10) with the highway estate further widened with realigned adjacent local roads, which will remove the existing tree planting within the central reserve and road embankment. Given the above, Natural England is concerned that there will be a significant negative impact on the special qualities of the AONB in this area, both through direct impacts and impacts to the setting of the AONB.

2.2 We also note that the application boundary now also appears to include areas of land where landscape mitigation measures for the Channel Tunnel Rail Link/High Speed 1 rail line were implemented. From the information provided, the alignment of the A2 and local roads appears to remove these previous mitigation measures which were implemented to mitigate the landscape and visual impacts of the rail line. Given the route alignment for the A2, there does not appear to be any additional land to reinstate this landscape mitigation and as such, the impacts of removing these previous mitigation measures need to be fully considered and mitigated/compensated for in addition to the further impacts that will arise from the Lower Thames Crossing project.

2.3 Natural England acknowledge that the landscape and visual impact assessment (LVIA) has yet to be finalised for the project and are keen to work with the Project Team, the AONB Unit and other interested parties to ensure that the viewpoints for the LVIA are appropriate and the impact assessment robust. We welcome the additional visual surveys to be undertaken in winter 2018/19 and look forward to providing input during the site visit and workshop in January once these are confirmed.

2.4 We note that the noise impact assessment detailed within Section 13 of the PEIR does not appear to include monitoring or an impact assessment of the noise that may result from the scheme on receptors, including people recreating within the Kent Downs AONB. However, we note that Section 8.5.3 of the PEIR mentions that noise surveys were due to be carried out in the summer of 2018 for receptors within the AONB. Natural England would expect the Environmental Statement to include a full assessment of noise in relation to the AONB along with details of the mitigation measures proposed.

2.5 Given the scale of the impacts to the Kent Downs AONB (with major negative impacts

predicted both during the construction and operational phases), Natural England would expect the scheme to deliver a visionary mitigation and compensation package. This may need to encompass measures both in the immediate locality of the scheme and further afield within the AONB. Natural England will of course be pleased to work with the Project Team, the Kent Downs AONB Unit and other relevant organisations to help inform the detailed mitigation strategy.

2.6 Given the potential change in vehicle movement patterns in Kent upon opening, with a likely increase in traffic along the A2/M2 corridor, Natural England recommends that the Environmental Statement includes a comprehensive consideration of the potential impacts to the Kent Downs along the transport corridor to the channel ports. This should include the consideration of impacts from increased vehicle movements and any highway and junction upgrade works or utility diversions that may be required along the A2/M2 and M20 corridors. Such an assessment does not appear to have been included within the PEIR.

2.7 On a more general note, Natural England would recommend that the Kent Downs AONB Management Plan is referenced within the 'Planning Policy' tables in the relevant sections of the PEIR and carried forward into the Environmental Statement.

3 Nationally and internationally important nature conservation sites

3.1 We welcome the ecological studies that have been undertaken or are ongoing. However in the absence of the detailed survey results Natural England is not able to provide advice on the likely direct and indirect impacts to designated sites, including Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Wetlands of International Importance under the Ramsar Convention (Ramsar Sites) and Marine Conservation Zones (MCZs). We would refer you to our response to the EIA Scoping Report dated 1 December 2017 (our reference 230863) for further clarity on the information that should be provided within the Environmental Statement. Natural England will of course be pleased to provide detailed advice in relation to the likely impacts and mitigation measures in the near future once you are able to share the survey results and draft impact assessment with us.

3.2 Since our response to the EIA Scoping response, where all direct impacts to designated sites and ancient woodland (including Claylane Wood) were to be avoided, the application boundary has now been amended to encompass areas of Shorne and Ashenbank Woods SSSI either side of the A2 corridor. It is unclear, in the absence of the finalised design, whether there will be direct land take from the SSS or areas of ancient woodland. Natural England strongly recommends that the scheme is designed to avoid all direct and indirect impacts to designated sites. Where this is not possible, a robust mitigation strategy will need to be implemented.

3.3 Natural England notified the Langdon Ridge SSSI on 29 June 2018. This notification has been consulted upon in recent months, and we are now assessing the responses to the consultation, with a decision on whether to confirm or withdraw this notification expected by 28 March 2019. This SSSI may not have been picked up in the baseline data collection, depending upon when certain searches were undertaken. Further information can be found on our website. It would appear appropriate for the impact assessment to consider whether there may be implications for this site as a result of the proposal.

3.4 The indicative 'potential nature of effects' and 'potential mitigation measures' detailed within Table 9.28 (construction phase) and Table 9.29 (operation phase) in general, appear appropriate at this high level in the absence of detailed survey information. One additional mitigation measure that doesn't appear to be considered is the use of timing restrictions to undertake the most disturbing activities outside of the sensitive periods of the year and we

would suggest this should be included as part of the overall mitigation measures. We will of course be pleased to provide input and guidance over the coming months once you are able to share the detailed survey results with Natural England.

3.5 It is not immediately clear from the PEI what the rationale for the use of a 20km zone of influence for displaced recreational users is. We may be able to assist with this impact pathway as there are strategic solutions operating in Kent to manage recreational pressure to coastal sites and similar work is at an advanced stage in Essex.

3.6 As mentioned in our response to the EIA Scoping Response, Natural England consider that the Environmental Statement should consider the impacts to designated sites that may result from this scheme within the area of influence, not just the application boundary. Such impacts could result from the measures to dispose of the tunnel arisings or from increased traffic flow (and resultant air quality impacts) as a result in the change in vehicle movements along the A2/M2 and M20 corridors accessing the channel ports. We therefore recommend that the impact assessment fully considers such impacts, outwith the Development Consent Order boundary.

4 Air quality

4.1 Within Natural England's advice to the Planning Inspectorate at the Environmental Impact Assessment scoping stage and during our recent meetings with the Project Team, Natural England requested that the air quality assessment considered the potential impacts to designated sites from the likely increases in traffic flow along the entire A2/M2 corridor and link roads to the M20 corridor. There are a number of chalk grassland SSSIs and SACs which are sensitive to air quality impacts including nitrogen deposition along these corridors which may be adversely impacted during the operation of the scheme. The PEIR does not include such an assessment, confining the assessment to the application boundary.

4.2 The air quality assessment will also need to consider the in-combination impacts that may occur from other plans and projects, including allocations within Local Plans within the area of influence of the scheme. As mentioned above, we consider the area of potential influence for the scheme should encompass the A2/M2 corridor along with the roads linking the A2/M2 to the M20 for vehicles travelling to the channel ports for the impact assessment.

5 Habitats Regulations Assessment

5.1 Natural England notes that the PEIR confirms that a Habitats Regulations Assessment will be prepared following this statutory consultation. Natural England would be pleased to advise on the detailed scope of the Appropriate Assessment in due course.

5.2 The Habitats Regulations Assessment should fully detail the potential direct and indirect impacts that may result from the scheme, including impacts for functionally linked land and designated sites outwith the Development Consent Order boundary where impacts may result, for example from the disposal of tunnel arisings and air quality impacts to designated sites adjacent to the wider strategic road network.

5.3 We note that table 9.6 (European designated sites and their extent) refers to Holehaven Creek as a proposed Special Protection Area (pSPA). For clarity, Holehaven Creek is not a pSPA but we advise that it holds a strong functional linkage to the Thames Estuary and Marshes SPA, and therefore we consider it is appropriate to include this site within the Habitats Regulations Assessment.

5.4 In addition, Paragraph 9.4.99 mentions the jetty location and we are pleased that this area has apparently been surveyed for its functional linkage to the Thames Estuary and Marshes SPA

and Ramsar Site. Please note that Natural England has recently provided a fuller commentary on our concerns linked to activities in this area, in our Discretionary Advice Service letter dated 4 December 2018. We refer you to that letter, and will not repeat our comments here.

6 Best and most versatile agricultural soil

6.1 Table 11.2 of the PEIR does not appear to reference the potential direct and indirect impacts to best and most versatile (BMV) agricultural land and soil that may result from this proposal. Natural England recommends that a full assessment of the potential impacts to BMV land and details of the avoidance and mitigation measures that are to be implemented is included within the finalised environmental statement.

7 Habitats of conservation importance

7.1 Natural England is concerned that the revised Development Consent Order boundary now encompasses areas of ancient woodland, some of which are also within the Shorne and Ashenbank Woods Site of Special Scientific Interest. We strongly recommend that the detailed design of the scheme ensures that impacts to all areas of ancient woodland and SSSIs are avoided and where this is not possible impacts are minimised, fully mitigated and compensated for.

7.2 Natural England would welcome clarity on what is meant by “new mosaic habitat” (Page 18) and whether this is intended to refer to the Section 41 priority habitat “open mosaic habitat on previous developed land” or a more generic description of habitat mosaics. We also note that the study area includes the proposed development boundary and a 500m buffer, ‘but also includes locations further away where indirect effects from the Project could occur’. It will be helpful to agree through the consultation process what the zones of influence are for various species groups. Please note that information may exist which suggests that a larger buffer may be appropriate for certain impact pathways.

7.3 Once the results of the detailed ecological studies are available to share with Natural England, we will be pleased to provide further advice in relation to habitats of conservation importance within our remit through our ongoing partnership approach. Given the length of the route, Natural England would expect significant mitigation measures to be implement along the whole route to maintain habitat connectivity for species and recreational routes for people.

8 Protected species and species of principal importance

8.1 When the Project Team are able to share the results of the protected species surveys with Natural England and the more detailed impact assessment, we will be pleased to provide advice on the nature and scale of the mitigation and compensation measures that are likely to be required. We will of course be pleased to work with the Team to ensure that, wherever possible, Natural England are able to provide the Letters of No Impediment (LONIs) for protected species ahead of the Development Consent Order submission. Similarly, we would be pleased to provide advice on species of principal importance within our remit once the detailed information is available.

8.2 Natural England notes that the Desk Study sources listed within table 9.4 do not include the Essex Field Club, which should be used in addition to the Biological Records Centre data. The Field Club hold substantial records in particular for invertebrates, and should be consulted for appropriate records for the Essex area.

8.3 We also welcome Highways England’s current view of the value of Lytag brownfield local wildlife site as being of national importance. It should be noted that the national invertebrate interest centres on the Lytag site, but is not confined to it, and may include other areas in that

vicinity. We will be pleased to comment further on this in due course.

8.4 At paragraph 9.4.24 (Table 9.9), notable records of plant species from Kent are listed. Please note that at least broad-leaved cudweed, stinking goosefoot and least lettuce are also known from appropriate habitats in Essex as well, however it does not appear that these have been noted in the desk study for Essex.

9 Environmental legacy

9.1 As mentioned previously, Natural England is keen to work with the Project Team and other environmental bodies to ensure that this project realises the Government's 25 Year Environment Plan aspirations contributing to a significant environmental legacy. As you are aware, the Defra Family has been working towards a shared environmental legacy vision for the Lower Thames Crossing which we have previously shared and for ease have included with this response.

9.2 The plan provides details of projects in key areas that the Environment Agency, Forestry Commission and Natural England consider the Lower Thames Crossing can help deliver in support of the 25 Year Environment Plan and to realise the Defra Family's aspiration for this to be an exemplar in sustainable development and environmental net gain. Many of the projects complement or are directly linked into much wider, partnership landscape scale conservation and/or access enhancements and we will be pleased to work with the Project Team in the coming months to realise the environmental legacy, both on land and within the estuary.

9.3 One of the key aspirations of the Defra Family is to ensure that the landscape, for people and wildlife, is not severed as result of the Lower Thames Crossing and associated link roads. Linear infrastructure projects like this have the potential to sever the landscape preventing movement of wildlife and making recreational access more difficult. To help maintain habitat connectivity and linkages for recreational users, Natural England considers that the scheme should ensure that a network or green/living bridges is provided along the length of the route facilitating movement and helping to future proof the scheme allowing species to move as their ranges change. We would also consider that the soft estate should be managed to maximise its biodiversity and landscape value with species-rich corridors for pollinators and habitats for widespread species created and maintained.

9.4 Below we have provided a little more detail of what the legacy may be able to deliver in the areas identified within the Defra Family vision and we would of course be pleased to provide further input to the Project Team on these legacy opportunities.

9.5 East Tilbury Area

The area is broadly within the Essex Living Landscape areas of Tilbury and Mucking Grassland and Marshes, and is situated within the Natural England Thames Estuary and Marshes Focus Area (such areas are where we are seeking to contribute towards landscape scale conservation). The area also adjoins the estuary with associated inter-tidal habitats and is set between areas of industrial use containing a hub for brownfield invertebrate conservation (to the west), and active landfill and quarry sites (much of which benefits from approved nature conservation led restoration schemes) to the east and north-east.

Opportunities exist in this area to ensure connectivity is both conserved and enhanced for invertebrate assemblages, in particular, along with other species groups since the presence of a new major road is likely to significantly hinder this. The integrity of the coastal margin should also be maintained as a functional corridor, not only for the intertidal avian assemblage

but also for notable botanical and other species.

9.6 Mardyke Valley Area

This area adjoins the Inner Thames Marshes SSSI and follows the valley eastwards towards the route of the Lower Thames Crossing. The area is broadly within the Essex Living Landscape areas of Mardyke Valley and Bulphan Fen and there are a number of conservation projects found here that involve the Essex Wildlife Trust, Environment Agency and Essex Biodiversity Project. Please note that this area includes the Orsett Fen area, where there is potential to work in partnership to restore wetland fen habitats. The Orsett and Bulphan Fen area includes a local wildlife site and the partnership would need to include Essex Rivers Hub and landowners.

9.7 Thames Chase Area

This area aligns with the broad areas of the Ingrebourne Valley and quarry landscapes and Mardyke and Aveley Forest, and includes part of the Essex Living Landscape areas of Ingrebourne Valley and Belhus Woods. There are many conservation projects set out in the Thames Chase Plan focussed on increasing habitat connectivity and enhancing for biodiversity that requires a mosaic of woodland, grassland and wetlands. The partnership would need to include Thames Chase Trust (with numerous partners including Forestry Commission, Essex County Council, Thurrock Council and the London Borough of Havering, amongst others).

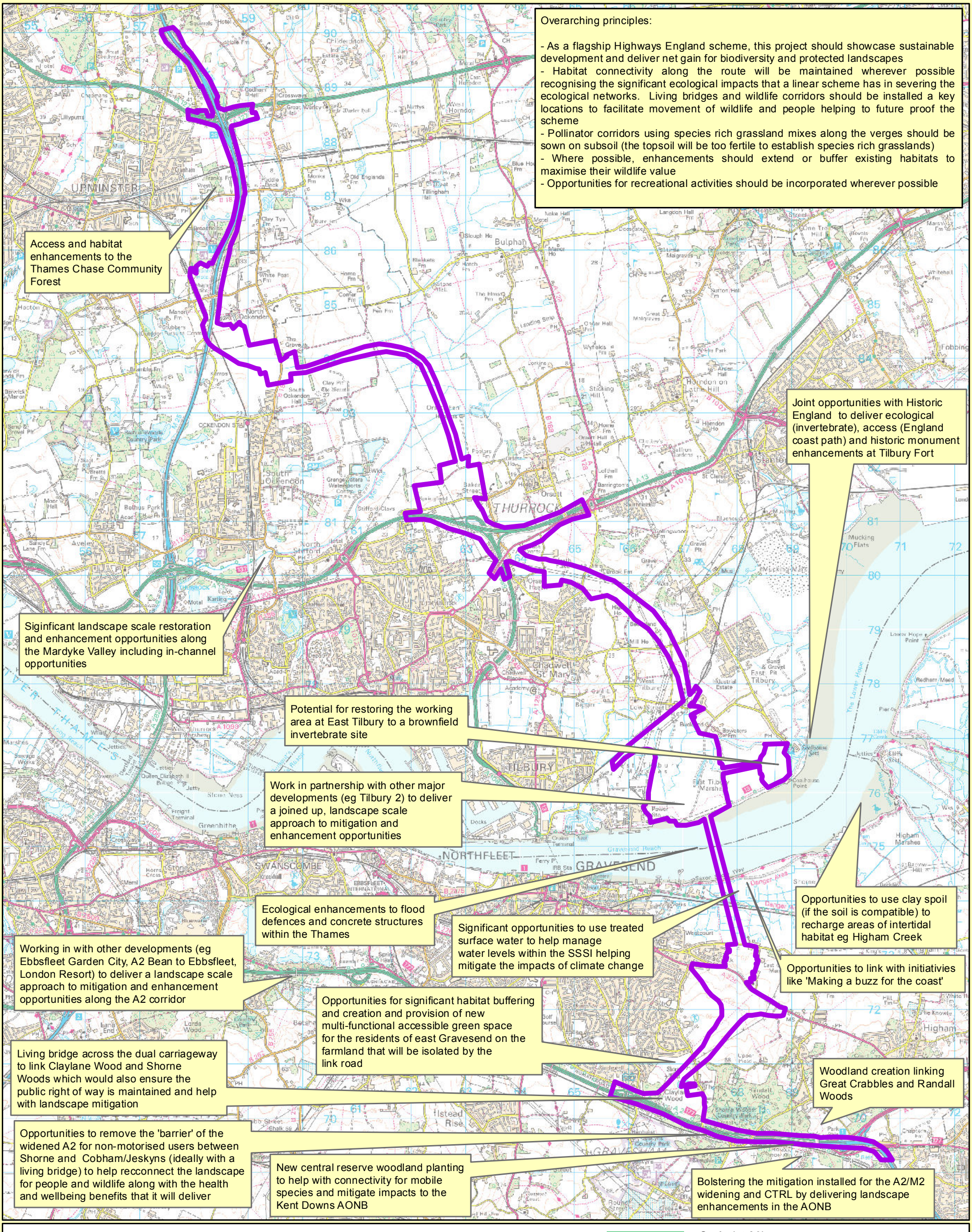
9.8 A2 Corridor

This area has a rich environmental heritage with the Kent Downs AONB, Shorne and Ashenbank Woods SSSI, the South Thames Estuary and Marshes SSSI and areas of ancient woodland, species rich grassland and historic parkland. Given the significant additional severance effect the fourteen lane dual carriageway will have for people and wildlife a visionary strategy to maintain and create new connections for people and wildlife presents the opportunity to deliver a significant environmental legacy. There are significant opportunities to link with developments at Ebbsfleet, the Swanscombe Peninsula and residential developments in Medway and Gravesham.

9.9 For all of the environmental legacy opportunities that Highways England progresses, it would be appropriate to select key species for each geographical area and/or habitat as indicators to aid the monitoring and success of the conservation outcomes. We would of course be pleased to work with the Project Team to develop such indicators of success if this would be helpful.

9.10 As will be expected of a scheme of this scale, post-construction monitoring, with reporting and defined performance against targets linked to baseline studies will be essential. This will need to be complemented by detailed management arrangements for any landscape and biodiversity mitigation features to secure their success in the long-term.

Lower Thames Crossing - Defra Family Potential Environmental Legacy Projects



Scale (at A3): 1:63,360

Map produced by [redacted]
Date: 03/05/2018. Map Reference: -

Annex C.2 Natural England Supplementary Consultation Response

Date: 01 April 2020
Our ref: 312335
Your ref: S42

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By email only, no hard copy to follow

Dear [redacted]

Lower Thames Crossing: Supplementary consultation

Thank you for your letter of the 27 January 2020 consulting Natural England on the supplementary information provided in support of the proposed Lower Thames Crossing scheme.

As with our comments on the Preliminary Environmental Information Report in 2018, our comments are, in the main, high-level, due to the nature of the consultation, the limited information provided on the results of the environmental studies and the lack of a detailed impact assessment and mitigation/compensation measures. We remain keen to work with the Project Team and Highways England to ensure that, wherever possible, the avoidance, mitigation and compensation measures for biodiversity and landscape impacts can be agreed ahead of the Development Consent Order submission.

Natural England is concerned that significant additional direct and indirect impacts to ancient woodland, the Kent Downs Area of Outstanding Natural Beauty (AONB) and Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI) have been identified so late in the consultation process. We were supportive of the approach taken by the Secretary of State with the preferred route announcement, where the route with the least impact to these assets was selected; it is therefore disappointing that such significant amendments are now proposed. Given the nature and scale of these additional impacts, in accordance with national planning policy, the environmental statement should include a detailed assessment of alternative options considered and provide details of why they were not progressed, considering a variety of matters including the environmental effects associated with each option.

Given the high level of policy protection afforded to the Kent Downs AONB, Shorne and Ashenbank Woods SSSI and ancient woodland, Natural England would welcome the opportunity for a much greater degree of engagement with Highways England and the utility providers in the near future.

Throughout our engagement with the project, we have always advised that there is significant scope for a more visionary design and construction to ensure that the project can deliver an environmental net gain approach in accordance with the Government's 25 Year Environment Plan and approach for planning. There remains great scope for this development to be one of Highways England's first major projects to deliver net gain as you work towards all schemes achieving this standard as part of your environmental commitment. It should aim to reconnect the landscape severed by both the existing and new/widened strategic road network helping to future proof the scheme for wildlife and people.

Although no such commitment has been provided within the supplementary consultation, we would welcome a clear intention being stated by Highways England to ensure this project is taken forward as an exemplar of the environmental benefits that can be delivered by a major infrastructure scheme. As Highways England move to delivering biodiversity net gain by 2040, such an approach would be in accordance with the Government's 25 Year Environment Plan and the Road Investment Strategy 2. As this is the largest road scheme in a generation, the green as well as the grey infrastructure should be truly exemplary.

Natural England's detailed comments in relation to the supplementary consultation are provided in Annex 1 appended to this letter. We have not exhaustively trawled and considered every boundary change detailed in the plans provided since there is insufficient environmental information for us to provide detailed advice.

We look forward to having the opportunity to work closely with the Project Team to better understand the ecological and landscape impacts and provide input into the mitigation strategies over the coming months prior to the development consent order submission. If in the meantime you have any queries please do not hesitate to contact us. For any queries relating to the specific advice in this letter please do not hesitate to contact me on [redacted]

Yours sincerely

[redacted]

Sussex and Kent Team

Annex 1: Natural England's detailed comments in relation to the Lower Thames Crossing supplementary consultation, January 2020.

1 General observations on the supplementary consultation information

1.1 Natural England welcomed our early engagement and constructive dialogue with the Lower Thames Crossing project and was supportive of the approach taken by the Secretary of State when the preferred route announcement was made. The preferred route selection, particularly south of the Thames Estuary, appeared to reflect the rich environmental assets within the route area by selecting the route that avoided direct impacts to designated nature conservation sites, avoided significant land take from within the Kent Downs Kent Downs Area of Outstanding Natural Beauty (AONB), and seeking to avoid impacts to areas of ancient woodland. Whilst it is acknowledged that the supplementary consultation has moved the southern tunnel portal further south, increasing the distance from the South Thames Estuary and Marshes Site of Special Scientific Interest (SSSI) and the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar Site, other changes have now significantly increased the likely environmental impacts.

1.2 Natural England is disappointed that, at such a late stage in the design process, scheme changes to facilitate the diversion of utilities along the A2 corridor, as proposed, would result in significant direct habitat loss to areas of Shorne and Ashenbank Woods SSSI, as well as significant impacts to the Kent Downs AONB. In addition there will be significant additional impacts to areas of ancient woodland and other habitats within the Kent Downs AONB.

1.3 The National Planning Policy Framework[1] requires proposals to avoid significant impacts wherever possible (through location or design, for example), progressing to mitigating any impacts that cannot be avoided and then compensating any residual impacts (the 'avoid, mitigate, compensate' hierarchy). In addition, Section 14 (2) (d) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[2] requires an environmental statement to include:

> 'a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;'

1.4 In addition, Section 4.26 of National Policy Statement for National Infrastructure (NPS)[3] states that:

> 'Applicants should comply with all legal requirements and any policy requirements set out in this NPS on the assessment of alternatives. In particular:
>
> - The EIA Directive requires projects with significant environmental effects to include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects. …'

1.5 Given the above, all options to avoid impacts should be fully explored within the environmental statement. In addition, the environmental statement should clearly demonstrate how the environmental impacts of the proposed scheme compare with alternative options including those previously discounted.

1.6 Whilst we are disappointed that the scale of impacts south of the Thames is now greater than

[1] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[2] http://www.legislation.gov.uk/uksi/2017/572/pdfs/uksi_20170572_en.pdf
[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf

presented previously, we welcome the removal from the development boundary of some areas of high value for nature conservation and biodiversity. In particular, the Goshem's Farm 'Conservation Area' and the Tilbury Ashfield 'A1' sites, which we are aware are of particular importance for invertebrates and vascular plants. Whilst we welcome the application of the avoidance principle in these locations, it should be noted that indirect impacts may still occur to these areas, and these should be taken forward into the impact assessment process, with mitigation and compensation measures provided as appropriate. We also note the removal of most of the field east of Goshem's Farm (except for access further east).

1.7 The supplementary consultation exercise, and in particular the Environmental Impacts Update report makes repeated comparison to the Preliminary Environmental Information Report (PEIR) as a point of reference. Natural England expressed significant concern during the consultation on the PEIR itself as we did not feel it provided an assessment of impacts to the level that would be expected for a project of this scale with such significant environmental impacts. It therefore appears misleading to make statements asserting that changes are better or worse than at the PEIR stage when those impacts were not presented in sufficient detail at the time. Indeed, Natural England is concerned that we have not seen any draft Environmental Impact Assessments (EIA) for the project, meaning our ability (and that of the wider stakeholder community) to input into this process and assist in shaping the outcome has been very limited to date.

1.8 We note from the plans accompanying the supplementary consultation that various land parcels are identified for ecological mitigation, however, it is not yet clear how these areas will be used for this purpose. This information is yet to be provided, and so Natural England remains unable to comment in particular on whether the scale and location of these areas is acceptable as directed by the EIA and Habitats Regulations Assessment frameworks. We cannot therefore rule out that additional land may be required to meet the requirements of the project.

1.9 The amended route now has the potential to impact on land required for mitigation measures agreed for other proposals in the Tilbury area and also remove the successful mitigation measures implemented for the Channel Tunnel Rail Link/High Speed 1 rail line in Kent. Given these impacts, this project should ensure that it does not negate the measures already agreed and/or implemented. If these wider impacts were to occur, this project should ensure that it replaces the measures previously agreed/implemented in addition to mitigating/compensating for the impacts from the Lower Thames Crossing itself and associated utility diversion works. This should be clearly identified within the environmental assessment and may require additional land to that identified within the supplementary consultation for ecological and landscape mitigation.

1.10 It should be noted that the refinements to the red line boundary may make it more difficult to understand and interpret some of the ecological survey information that has been collected. We accept that surveys have been designed to inform an environmental baseline at the time the scheme was first developed, and that this has, to some extent, informed revisions to that boundary. We are concerned however that the surveys have therefore not been designed with revised boundary information in mind, and this may make it more difficult to interpret the value and importance of specific areas. For example, the removal of the two high quality invertebrate sites (Ashfield 'A1' and Goshem's Farm 'Conservation Area') which have already been surveyed are likely to mask the residual value of invertebrate habitats within the red-line once they are removed. It is important that within the environmental statement, all of the surveys are presented with sufficient resolution so that the contribution of each component area (using either recognisable natural or imposed i.e. planning red-line boundaries) can be properly understood both in isolation and collectively as sub areas of the landscape

2 Designated sites

2.1 Section 5.29 of the NPS states that:

> 'Where a proposed development on land within or outside a SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent **should not normally be granted** [our emphasis]. Where an adverse effect on the site's notified special interest features is likely, an exception should be made only where the benefits of the development at this site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs. The Secretary of State should ensure that the applicant's proposals to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest, are acceptable. Where necessary, requirements and/or planning obligations should be used to ensure these proposals are delivered.'

2.2 Given the requirements of the NPS, Natural England is disappointed that significant direct and indirect impacts to areas of Shorne and Ashenbank Woods SSSI are now being consulted upon so late in the design process.

2.3 In addition, Section 5.32 of the NPS provides guidance on how irreplaceable habitats should be considered; specifically for ancient woodland it states:

> 'Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.'

2.4 This is further strengthened within the more recent National Planning Policy Framework which states in Paragraph 175 that when determining a planning application, the following principle should apply in respect of irreplaceable habitats 'development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists'

2.5 Whilst no figures have been provided for the loss of ancient woodland habitat from within the SSSI, based upon the maps provided it would appear that this would be approximately 20-30 hectares of woodland directly lost or significantly impacted by the scheme. Even if trenchless installation is to be employed for the utility diversions, a new permanent easement will be established conferring powers to the utility providers to manage the wayleave and undertake habitat management measures which could result in additional impacts.

2.6 By separating out the impacts from the transport infrastructure elements of the Lower Thames Crossing and the utility works which are required to facilitate the Lower Thames Crossing scheme it is unclear whether the revised designated site impacts are considered cumulatively. Given the two are inextricably linked, the environmental statement should consider all of the direct and indirect impacts to the designated sites in the round.

2.7 The moving of the southern tunnel portal further away from the South Thames Estuary and

Marshes SSSI and the Thames Estuary and Marshes SPA and Ramsar Site is welcomed. However, the addition of the proposed ground preparation tunnel could result in additional impacts. There is the potential for further hydrological impacts (above those we have expressed concern with previously for the two main tunnels) to the grazing marsh and ditch habitats within the designated sites if there is a link between the surface and ground water or changes to the hydrological regime resulting from the scheme. This needs to be fully resolved prior to the submission of the application.

2.8 No further information is provided as to the likely impacts from the utility works proposed within the South Thames Estuary and Marsh SSSI and the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar Site. Greater clarity on the works and the avoidance measures that have been considered need to be provided.

2.9 Given the high level of policy protection afforded to SSSIs and ancient woodland, Natural England would welcome a much greater degree of engagement with Highways England and the utility providers in the near future. It would be helpful to have a discussion on potential options to avoid impacts through the consideration of alternative approaches in accordance with Section 4.26 of the NPS.

2.10 Natural England considers that these should be fully resolved prior to submission of the development consent order in order that a robust assessment of impacts and the nature and scale of any mitigation and compensation measures are commensurate with the scale of impact if consent is granted. We do not consider it appropriate to defer such fundamental detail to the post consent stage.

3 Protected landscapes

3.1 Natural England is disappointed that significant areas of additional land take from within the Kent Downs AONB has been proposed so late in the design process to facilitate this scheme. This direct land take is primarily ancient and long-established woodland which is a key component of the AONB (please see Section 4 of this letter for our advice in relation to ancient woodland).

3.2 Section 85(1) of the Countryside and Rights of Way Act 2000 places a duty on public bodies, including Highways England and statutory undertakers (which includes utility providers), this duty states:

> 'In exercising or performing any functions in relation to, or so as to affect, land in an area of outstanding natural beauty, a relevant authority shall have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty.'

3.3 The NPS for National Networks states in Section 5.150 that 'Great weight should be given to conserving landscape and scenic beauty in nationally designated areas. National Parks, the Broads and Areas of Outstanding Natural Beauty have the highest status of protection in relation to landscape and scenic beauty. Each of these designated areas has specific statutory purposes which help ensure their continued protection and which the Secretary of State has a statutory duty to have regard to in decisions'.

3.4 In addition, Section 5.151 of the NPS states that 'The Secretary of State should refuse development consent in these areas [protected landscapes including AONBs] except in exceptional circumstances and where it can be demonstrated that it is in the public interest'.

3.5 Similarly, Section 5.152 of the NPS states 'There is a strong presumption against any significant road widening or the building of new roads and strategic rail freight interchanges in … Areas of Outstanding Natural Beauty, unless it can be shown there are compelling reasons for the new or enhanced capacity and with any benefits outweighing the costs very significantly'.

3.6 Natural England is concerned that the utility diversions and design amendments to the highway elements that have come at this late stage will now result in significant additional direct land take including from key habitats contributing to the landscape character of the AONB in this part of Kent. The proposed installation of significant new utilities within Ashenbank Wood to the south of the A2 and the widened working width now proposed within Shorne Country Park to the north of the A2 will have significant additional direct and indirect impacts to the AONB. Whilst no figures for direct habitat loss and land take have been provided, such an approach would appear contrary to the National Policy Statement and the scheme should fully demonstrate the steps have been taken to avoid all direct and indirect impacts to the AONB.

3.7 Given the high level of policy protection afforded to the Kent Downs AONB, Natural England would welcome a much greater degree of engagement with Highways England and the utility providers in the near future. All options to avoid impacts should be fully explored within the environmental statement, which may also mean the options discounted previously should be revisited if these have a lesser environmental impact. Such an approach is supported in Section 4.26 of NPS which states that:

'Applicants should comply with all legal requirements and any policy requirements set out in this NPS on the assessment of alternatives. In particular:

- The EIA Directive requires projects with significant environmental effects to include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects. …
- There may also be policy requirements in this NPS, for example the flood risk sequential test and the assessment of alternatives for developments in National Parks, the Broads and Areas of Outstanding Natural Beauty (AONB).'

3.8 Natural England considers that these matters should be fully resolved prior to submission of the development consent order in order that a robust assessment of impacts and the nature and scale of any mitigation and compensation measures are commensurate with the scale of impact if consent is granted. We do not consider it appropriate to defer such fundamental detail to the post consent stage.

3.9 The Environmental Impacts Update report details that 'Construction activities would continue to encroach into the treed landscape of the A2/HS1 transport corridors, both within the AONB and its setting. The tree removal in combination with construction activities would result in a clearly evident widening of the infrastructure corridor, greater physical and visual severance and further isolating Shorne Woods Country Park to the north from Cobham Hall parkland/Ashenbank woods to the south'. The Environmental Impacts Update report also confirms during operation that 'There would be a worsening of the nature of effects in the PEIR; a major negative change for landscape and moderate to major [negative] change in views for a range of receptors'.

3.10 The utility diversion proposals (which we understand are only required to facilitate the Lower Thames Crossing scheme) along the A2 corridor bring a new range of landscape impacts to the scheme. The Environmental Impacts Update report states that 'These would be new adverse effects that would lead to the worsening of the major adverse effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors'.

3.11 By separating out the impacts from the transport infrastructure elements of the Lower Thames Crossing and the utility works which are required to facilitate the Lower Thames Crossing scheme it is unclear whether the revised landscape impacts are considered cumulatively. Given the two are inextricably linked, the environmental statement should consider all of the direct and indirect impacts to the AONB in the round.

3.12 There is no mention within the Environmental Impacts Update report (for the road or utility diversion works) of the impacts to receptors within the AONB from urbanising effects or tranquillity despite Natural England requesting that this is considered as part of the assessment process. We would be grateful if reassurance can be given that such an assessment is to be included within the environmental statement.

3.13 Despite the significant additional landscape impacts predicted within the Environmental Impacts Update, very limited information has been provided in relation to the mitigation measures that are proposed. The report refers regularly to the mitigation proposed in the PEIR, which Natural England expressed concerns about previously as we considered it was short on detail. In the absence of detailed information on the nature and scale of the avoidance and mitigation measures that are being proposed, Natural England has significant concerns regarding the approach being taken.

3.14 Notwithstanding the concerns above, Natural England would welcome the opportunity to work with Highways England and colleagues from the Kent Downs AONB Unit to ensure that the impacts are fully understood and that any mitigation measures proposed for ecology and landscape are compatible and sensitive to their location. For example, we note from the General Arrangement Plan Sheet 1 (Mapbook 1) that the potential receptor site for ancient woodland compensation is proposed in a more open area of the AONB which may have implications for the landscape character and receptors in this area of the AONB. We recommend that a holistic approach to consideration of the ecological and landscape mitigation measures should be adopted.

4 Wider biodiversity/scheme considerations

4.1 We note that, in addition to the additional direct and indirect impacts to the ancient woodland within Shorne and Ashenbank Woods SSSI, the scheme will also now impact greater areas of ancient woodland outside of the SSSI at Ashenbank Wood and Claylane Wood in particular. It is again disappointing that these increased impacts have come at such a late stage in the design process.

4.2 Section 5.32 of the NPS (which is replicated in the 'Designated Sites' section above) details that developments that result in the loss or deterioration of irreplaceable habitats including ancient woodland should not be granted unless the national benefits of the development at that particular location outweigh the loss.

4.3 Given the strong policy protection afforded to ancient woodland (and the AONB of which it is a key component of the landscape character), we recommend that a much greater emphasis on design measures to avoid direct and indirect impacts to this irreplaceable habitat is required at this stage.

4.4 As with impacts to designated sites and the Kent Downs AONB, Natural England considers that these matters, including the consideration of alternatives, should be fully resolved prior to submission of the development consent order in order that a robust assessment of impacts and the nature and scale of any mitigation and compensation measures are commensurate with the scale of impact if consent is granted. We do not consider it appropriate to defer such fundamental detail to the post consent stage.

4.5 The Thames Estuary is considered to be a very important area for invertebrate species. Within this area, from your own studies and those undertaken for other development proposals, the invertebrate assemblages on brownfield sites around the northern tunnel portal at Tilbury appear to be of particularly high nature conservation value. Given the revised application boundary for the Lower Thames Crossing, we would expect all such sites to be avoided where at all possible. In addition, a robust assessment of the impact should be provided as part of the environmental statement for invertebrates in the Tilbury area. Where impacts cannot be avoided, a comprehensive mitigation, compensation and enhancement

package should be included within the environmental statement.

4.6 There is a lack of additional/updated information on the impact to protected or notable species or habitats of conservation importance (other than ancient woodland) within the supplementary consultation package. As such, we are not able to provide further advice on these aspects at present. We would expect a robust assessment of the direct and indirect impacts to all protected and notable species and habitats of conservation value to be included within the environmental statement. This should also include a comprehensive avoidance, mitigation, compensation and enhancement package for all species groups and habitats of conservation interest directly and indirectly impacted by the scheme.

4.7 Section 5.25 of the NPS provides clarity on how wider biodiversity should be considered stating:

> 'As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives.'

4.8 Whilst reference is made throughout the supplementary consultation documents to impacts to habitats of nature conservation value, little information is provided on how the scheme changes will impact species associate with these habitats. Given the paucity of information provided in the PEIR, it is disappointing that no additional information has been provided at this supplementary consultation stage. It is therefore not possible for Natural England to provide advice regarding protected and notable species, nor whether the scale of mitigation measures are appropriate.

4.9 We note that no additional information on impacts to protected or notable species is provided within the Environmental Impacts Update report. Similarly, no further information regarding the proposed mitigation and/or compensation measures are provided. We therefore recommend that the environmental statement includes a full assessment of any additional impacts that the scheme amendments may have for protected and notable species and other features of conservation interest.

4.10 Whilst not specifically resulting from the supplementary consultation, mitigation and compensation for impacts to protected and notable species is not normally acceptable within Sites of Special Scientific Interest if the species concerned are not an interest feature. This is because the management priority within designated sites should be to conserve and enhance the species interest of the sites.

5 Environmental legacy

5.1 It is disappointing that no commitment has been made in the supplementary consultation package to demonstrate how this project will deliver opportunities for environmental gain to help realise the Government's 25 Year Environment Plan aspirations contributing to a significant environmental legacy. This is despite such an approach being highlighted in our responses to the Environmental Impact Assessment Scoping Report and the Preliminary Environmental Information Report with scheme wide opportunities suggested by the Defra family to the design team.

5.2 With the Environmental Impacts Update report highlighting that the revisions to the scheme will now result in significantly increased severance for people, landscape, habitats and wildlife along the A2 corridor a much more visionary strategy for providing habitat connectivity should be proposed. The Department for Transport's Road Investment Strategy 2: 2020-2025 (RIS2) highlights the role that the strategic road network has to play in supporting biodiversity on the soft estate along with the role that green infrastructure has to play in improving the quality of life of those impacted by road schemes.

5.3 Given the severance across the route as a whole, along with the significantly increased severance that is now identified from the recent scheme changes, a much greater emphasis should be placed on ensuring connectivity is enhanced for biodiversity as well as pedestrians, cyclists and equestrians. Exemplary design and provision of dedicated green/living bridges crossing the A2 corridor to connect areas of the Kent Downs AONB for people and wildlife should form an integral part of the design.

5.4 With the exception of the Thong Lane green bridge, the living elements of the combined road/green bridges presented within the supplementary consultation do not appear to offer much scope for providing ecologically robust habitat connectivity. Similarly, they are unlikely to provide a high quality experience for pedestrians, cyclists and equestrians as they do not appear to provide opportunities to shield and separate them from the traffic on the shared bridges and the significant volume of traffic along the strategic road network they cross.

5.5 This project has the opportunity to be exemplary as Highways England moves to net gain by 2040. It should aim to reconnect the landscape severed by both the existing and new/widened strategic road network helping to future proof the scheme by building habitat resilience, facilitating movement of species and providing opportunities for people to connect with nature. Since this is the largest road scheme in England since the M25 was built, the green as well as grey infrastructure should be truly exemplary.

5.6 All of these are recognised as key elements for the strategic network within RIS2. Natural England would therefore recommend that a much more far-sighted approach to design is adopted in line with the Department for Transport's guidance and the Government's 25 Year Environment Plan[4] which is a cross Government department strategy.

6 Sector specific comments – highway elements

6.1 Narrowing the A2/M2 corridor through the Kent Downs

Whilst Natural England welcomes the narrowing of lane four on the east and west bound carriageways along with the removal of the hard shoulder on the eastbound link road, the nature and scale of impacts remains significant. Narrowing the central reservation and complete removal of the existing, well established woody vegetation which is an effective screen of the current A2 for receptors within the AONB is likely to significantly increase the landscape and visual impact of the scheme.

As mentioned previously, the separation of the impacts from the revised highway infrastructure elements from the additional land take and associated impacts from the Kent Downs AONB and Shorne and Ashenbank Woods SSSI for the utility diversions has the potential to underplay the cumulative impacts. The revised assessment of noise and vibration during construction and operation does not appear to reflect the impacts to tranquillity within the AONB. Similarly, indirect impacts do not seem to be reflected in the landscape or biodiversity assessments.

Whilst the Environmental Impacts Update report highlights the mitigation for landscape and biodiversity will continue to reflect those previously detailed in the PEIR, Natural England expressed concern with the level of information provided at that stage. To date, the absence of detailed information on the likely ecological and landscape impacts and mitigation/ compensation measures means we are not able to provide advice on whether the scale of expected effects or the appropriateness of the mitigation measure/compensation measures across the whole route. For a project of this scale and nature, this remains a significant concern as the scheme is due to be submitted shortly.

6.2 Lower Thames Crossing M2/A2 Junction

The observations detailed in Section 6.1 of this letter regarding landscape and biodiversity impacts are equally relevant to this section of the scheme.

[4] https://www.gov.uk/government/publications/25-year-environment-plan

It is very disappointing that the design changes now result in significantly greater loss of ancient woodland at Claylane Wood to the road scheme itself which will be further impacted by the utility works required to facilitate the Lower Thames Crossing scheme.

6.3 A2 and local connection to Gravesend east
In the absence of more detailed information, Natural England is not able to provide any comments on these changes at present.

6.4 Creation of Chalk Park
In the absence of more detailed information, Natural England is not able to provide any comments on these changes at present.

6.5 Relocation of the southern tunnel entrance approximately 350 metres south
Natural England welcomes the relocation of the tunnel entrance which is likely to reduce the noise and visual disturbance impacts to the South Thames Estuary and Marshes SSSI. However, in the absence of details of the hydrogeological modelling and an understanding of whether there is a link between the surface and ground water, there remains a significant concern regarding hydrological impacts to the designated sites, particularly with the addition of the ground preparation tunnel.

6.6 Thong Lane over the Lower Thames Crossing green bridge
Natural England welcomes the widening of the proposed green bridge at Thong Lane. To maximise the benefit to wildlife and pedestrians, Natural England would welcome the opportunity to be engaged more fully in the design process in the near future.

6.7 Ground preparation tunnel
We note that no information has been provided in the Environmental Impacts Update report on the potential biodiversity impacts resulting from the ground preparation tunnel as the assessment has yet to be undertaken. Given the ground preparation tunnel will be under the South Thames Estuary and Marshes SSSI, there is the potential for impacts to arise from noise, visual disturbance and hydrological impacts which should be fully explored in the environmental statement.

6.8 Removal of Tilbury Junction, rest and service area and maintenance depot
The table of expected effects (biodiversity) indicates that this change will 'reduce the overall extent of habitat loss reported in the PEIR'. However it should be noted that to date (neither in the PEIR nor in the Supplementary Consultation), no extent of habitat loss has been provided to consultees which would inform an impact assessment. Whilst any reduction in loss of habitats is welcomed in principle, the project as a whole has yet to demonstrate that its impacts will be appropriately mitigated or compensated. The lack of any preliminary or provisional data means that it is not possible for us to comment on the adequacies of the assessment process, its underlying survey findings, and its overall approach to environmental impacts and opportunities.

Within the wider Tilbury area, the images provided within the 'Guide to Supplementary Consultation' document indicate a restoration landscape which is largely returned to agriculture. Whilst we understand this to be the permitted after use for large areas of the red-line boundary, it should be noted that for several areas the current permitted after use is for 'grassland' which is to be an ecologically-driven design (i.e. not necessarily agricultural). Natural England understands that several of the former power station ashfields are to be restored for ecological outcomes, and the Lower Thames Crossing project should a) not compromise the ability for this outcome to be achieved, and b) should actively assist and collaborate in seeking to realise the long-standing ecology outcomes for this area. All parties should seek a common ground position on the planning baseline for the area affected.

6.9 Tilbury Viaduct length reduced
The expected effects of the Tilbury viaduct length reduction on Biodiversity are proposed to be

the same as presented in the PEIR. It is not clear from the plans supplied to what extent the viaduct (in either its former or amended design) can avoid impacts upon important ecological interests in the area of Low Street Pit local wildlife site.

6.10 Muckingford Road realignment and green bridge
Natural England supports the provision of well-designed green bridges of which incorporate a variety of end uses including for ecology and, where compatible, access and recreation. To ensure the proposed green bridge in this location is fit for purpose, further information should be provided to understand its proposed design, including in principle planting aspirations and also to ensure that the various end uses are appropriately compatible and fit for purpose (for example, how might any lighting requirements for a footpath integrate with the requirement for a dark corridor for wildlife).

6.11 Route realignment near Chadwell St. Mary and Linford
We note the general conclusions presented for the realignment of this stretch (that the extent of habitat loss within this area will be reduced), but as detailed above we have no impact assessment at this point with which to test this conclusion. For example, the nature of the habitat net change is not detailed in the summary.

6.12 A13 / A1089 junction changes
No specific comments on this section.

6.13 Rectory Road realignment
No specific comments on this section.

6.14 Hornsby Lane closure
No specific comments on this section.

6.15 M25 to A13 southbound land removal
No specific comments on this section.

6.16 Routing through the Mardyke
The route in this section carries with it the opportunity to contribute towards the restoration of important wetland habitats. We note the generally neutral conclusions reached on net biodiversity outcomes, but query whether the additional biodiversity gains will be significant beneath the viaduct due to the effects of shading. The project should aim to maximise the opportunities presented by the scheme to meet nature conservation objectives in this area.

6.17 The height of LTC and North Road
No specific comments on this section.

6.18 Thames Chase Community Forest – new bridge
We generally support the provision of access mitigation for users of the Thames Chase Community Forest. This should aim to target the wide range of user groups, and integrate ecological functions as well where possible.

6.19 M25 junction 29 changes
No specific comments on this section.

6.20 The Coalhouse Seawall
Hopefully the Project Team are aware of a sea wall breach in the area of Coalhouse Fort, which means that the proposed use of this area for protected species mitigation may be compromised (with reference to General Arrangement Plan Sheet 8a). We are aware that discussions are ongoing regarding future responsibility for the management and maintenance of the sea wall in this location, but raise concerns that this area may not be fit for purpose without assurances that it can deliver its objectives in the long-term if the sea wall is allowed to breach in either a managed or unmanaged way. If this is the case, then additional land may be required to deliver the objectives intended for this area elsewhere.

7 Sector specific comments – utility diversions

7.1 Utility proposals at the A2 junction and corridor

As mentioned elsewhere in this letter, Natural England is disappointed that such a large additional area of land take directly and indirectly impacting the Kent Downs AONB, Shorne and Ashenbank Woods SSSI, ancient woodland and other biodiversity interests has been identified so late in the design process.

Additional construction impacts from noise, whilst not directly referring to the impacts to tranquillity within AONB, have been classified within the supplementary consultation as temporary impacts but will be for a period of several years. It would be helpful to understand the duration of such 'temporary' impacts.

Given the significant land take and removal of ancient and long-established woodland habitat now proposed from within the Kent Downs AONB required for the utility diversion works to facilitate the Lower Thames Crossing, Natural England would consider this impact to be major negative (not 'moderate to major negative' for views as detailed in the Environmental Impacts Update).

Given the irreplaceable nature of ancient woodland, Natural England is concerned that the Environmental Impacts Update report states 'As reported in the PEIR, extensive planting north of the A2 would help offset the loss of ancient woodland within the SSSI designation. Receptor sites for protected species, such as dormouse and great crested newt, have been identified'. Such an approach does not appear to follow the 'avoid, mitigate, compensate' hierarchy detailed in planning policy. In addition, no information has been given on how the direct and indirect impacts to the woodland south of the A2 will be addressed.

Given the high level policy protection afforded to SSSIs and ancient woodland, and its irreplaceable nature, all measures to avoid and reduce impacts should be fully explored. If, during the development consent order process, it is agreed there are no alternative options with no or a lesser impact to deliver the scheme, then a robust and comprehensive mitigation and compensation package will be required which will need to ensure ecological mitigation does not result in additional landscape impacts and vice versa.

7.2 Utility proposals around the southern tunnels entrance

Given the additional impacts to Claylane Woods that have now been identified, the comments in Section 7.1 regarding avoidance of impacts, a comprehensive mitigation and compensation package and ensuring ecological and landscape connectivity apply equally to this section.

7.3 Utility proposals around Tilbury

Based upon the limited information provided within the Environmental Impacts Update, we have no observations to make on the additional environmental impacts from the amendments at this stage but will review these once the environmental statement is submitted.

7.4 Utility proposals around the A13/A1089 junction (east)

Based upon the limited information provided within the Environmental Impacts Update, we have no observations to make on the additional environmental impacts from the amendments at this stage but will review these once the environmental statement is submitted.

7.5 Utility proposals around the A13/A1089 junction (west)

Based upon the limited information provided within the Environmental Impacts Update, we have no observations to make on the additional environmental impacts from the amendments at this stage but will review these once the environmental statement is submitted.

7.6 Utility proposals around Ockendon

Based upon the limited information provided within the Environmental Impacts Update, we have no observations to make on the additional environmental impacts from the amendments

at this stage but will review these once the environmental statement is submitted.

7.7 Utility proposals around the Lower Thames Crossing/M25 junction
Based upon the limited information provided within the Environmental Impacts Update, we have no observations to make on the additional environmental impacts from the amendments at this stage but will review these once the environmental statement is submitted.

7.8 Utility proposals around the M25 junction 29
Based upon the limited information provided within the Environmental Impacts Update, we have no observations to make on the additional environmental impacts from the amendments at this stage but will review these once the environmental statement is submitted.

8 Marine works

8.1 We note that there are no proposed changes to the jetty location within the supplementary consultation package but that amendments are proposed allowing greater flexibility regarding the water discharge to the Thames. It is unclear from the information provided whether there will be any additional implications for the Thames Estuary and Marshes Special Protection Area and Ramsar Site including or functionally linked land and their underpinning Sites of Special Scientific Interest; should this be the case they should be fully assessed within the environmental statement.

Annex C.3 Natural England Design Refinement Consultation Response

Date: 12 August 2020
Our ref: 320851
Your ref: -

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Lower Thames Crossing
[redacted]

By email only, no hard copy to follow

Dear Sir or Madam

Lower Thames Crossing: Design Refinement Consultation

Thank you for consulting Natural England and seeking our views on the Design Refinements consultation for the Lower Thames Crossing project.

As with our comments on the Preliminary Environmental Information Report in 2018 and the Supplementary Consultation earlier this year our comments are, in the main, high-level, due to the nature of the consultation, the limited information provided on the results of the environmental studies and the lack of a detailed impact assessment and clarity on the mitigation/compensation measures.

Throughout our engagement with the project, we have always advised that there is significant scope for a much more visionary design and construction to ensure that the project can deliver an environmental legacy in accordance with the Government's 25 Year Environment Plan and approach for planning which is not reflected within this Design Refinement consultation. There remains great scope for this development to be one of Highways England's first major projects to deliver net gain as you work towards all schemes achieving this standard as part of your environmental commitment. It should aim to reconnect the landscape severed by both the existing and new/widened strategic road network helping to future proof the scheme for wildlife and people. Much more visionary design of elements such as the green bridges to help link areas of the Kent Downs AONB would result in significant landscape, wildlife and people benefits.

Although no such assurance has been provided within this Design Refinement consultation, we would welcome a clear commitment being provided by Highways England to ensure this project is taken forward as an exemplar of the environmental benefits that can be delivered by a major infrastructure scheme. As Highways England move to delivering biodiversity net gain by 2040, such an approach would be in accordance with the Government's 25 Year Environment Plan and the Road Investment Strategy 2. Given that this is the country's largest road scheme in a generation, the green as well as the grey infrastructure should be truly exemplary.

Natural England's detailed comments in relation to the supplementary consultation are provided in Annex 1 appended to this letter. We have not exhaustively trawled and considered every boundary change detailed in the plans provided since there is insufficient environmental information for us to provide detailed advice.

I trust these comments are helpful and we will of course provide further comments once the final documents are submitted. For clarity on any of the points in this letter please do not hesitate to contact me by email to [redacted].

Yours faithfully

[redacted]

Sussex and Kent Team

cc [redacted]Lower Thames Crossing

Annex One: Natural England's detailed comments in relation to the Lower Thames Crossing Design Refinements consultation, August 2020.

1 General observations

1.1 Whilst it is acknowledged that the direct loss of habitat from Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI) has been reduced, Natural England remains concerned that the scheme continues to propose direct loss of ancient and semi natural woodland (both within the SSSI and at other locations along the route) along with direct impacts to the Kent Downs Area of Outstanding Natural Beauty (AONB).

1.2 Reference is made through the Environmental Impacts Update report to the 'Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the areas biodiversity'. Unfortunately no details have been provided on the updated mitigation measures proposed and it would be helpful if more information is provided.

1.3 Similarly, despite the significant changes to the scheme which are likely to result in further impacts to the Kent Downs AONB no additional mitigation measures have been proposed. Natural England would recommend that further clarity and information is provided.

1.4 In addition, for a number of the updates, greater impacts to wider biodiversity assets are predicted but no detail is provided or information on the additional mitigation measures that are required. It would be helpful if greater clarity were provided where changes are predicted.

1.5 The Design Refinement consultation, and in particular the Environmental Impacts Update report, makes repeated comparison to the Preliminary Environmental Information Report (PEIR) as a point of reference. Natural England expressed significant concern during the consultation on the PEIR itself as we did not feel it provided an assessment of impacts to the level that would be expected for a project of this scale with such significant environmental impacts. It therefore appears misleading to state that changes are better or worse than at the PEIR stage when those impacts were not presented in sufficient detail at the time.

1.6 The Design Refinement consultation, within the Environmental Impacts Update, suggests that for some impacts the mitigation measures have been amended. However, no information has been provided on the detailed measures proposed (including within the PEIR previously). In addition, a habitat balance sheet detailing the areas of biodiversity value impacted and that which is being provided to compensate has not been shared. In the absence of this information Natural England is not able to provide advice on the appropriateness or otherwise of the mitigation measures contained within the Design Refinement consultation.

1.7 Throughout the consultation stages for the project, various amendments have been made to the design with subsequent implications for the resulting environmental impacts. Despite these additions (some of which will result in further landscape and biodiversity impacts), the Environmental Impacts Update reports generally states that the impacts and mitigation measures reflect those previously detailed within the PEIR. It is unclear whether the scheme amendments are being considered in a cumulative way; whilst they may be minor on their own when considered together across the various refinements they may be more significant. It would be helpful if clarity were provided on how these changes have been considered.

2 Design Refinements M2/A2 Area

2.1 Update 1 Ancient Woodland compensation between Claylane Woods and Shorne Woods

Whilst it is stated that, due to the utility diversions within Claylane Wood there will be a reduction in the area of woodland planting/creation in this area it is not clear what the level of

habitat loss and planting will be. Whilst this may not change the conclusions previously reached within the PEIR, it has the potential to impact the ecological functionality of the ancient woodland and the woodland planting. A key element of any ecological mitigation strategy is to maintain/enhance habitat connectivity which does not appear to be reflected within the approach now proposed.

2.2 **Update 2 Ancient woodland planting near the edge of Gravesend**
Due to the utility diversions, the Design Refinements Environmental Impacts Update report confirms that 'As ancient woodland compensation near Claylane Wood has been reduced… we would increase the proposed ancient woodland compensation planting near the edge of Gravesend, as much as is reasonably practical'.

Unfortunately no details of the area of woodland planting/creation is provided and the visual representations within the 'Guide to the design refinement consultation' appears to show little difference between the Supplementary consultation (Figure 3.7) and the current Design Refinement consultation (Figure 3.8). It would be helpful if details of the areas of habitat change were provided.

The impacts of urbanising effects on the woodland planting in this area in realising the ecological objectives of the habitat will also need to be fully considered within the environmental statement.

2.3 **Update 3 Ancient woodland compensation between Brewers Wood and Great Crabbles Wood.**
The refinements to the woodland planting/creation in this area should fully reflect the landscape character of the Kent Downs Area of Outstanding Natural Beauty (AONB) including impacts to landscape character and to receptors within the AONB. Such a consideration does not appear to be reflected within the Design Refinement consultation.

Given the direct loss of habitat (ancient and semi-natural woodland) from within the Shorne and Ashenbank Woods SSSI, if the Secretary of State is minded to grant consent, then measures to compensate for the impacts to the national SSSI series will be required. It is unclear from the documentation provided (including the previous consultations) how the scheme proposes to address the loss of the SSSI habitat. Greater clarity should be provided on the measures to be implemented to maintain the SSSI series.

2.4 **Update 4 Ancient woodland compensation south of High Speed 1**
Whilst it is stated that the area of woodland planting in this area has been reduced to avoid impacts to a cultural heritage building, it is unclear if the ecological functionality of the woodland planting/creation will be maintained. As mentioned previously, for all habitats and ecological impacts much greater clarity should be provided on the areas to be lost and replaced and the ecological and landscape functionality of the habitat.

2.5 **Update 5 Ancient woodland compensation to the north of Shorne Woods**
It is welcomed that the design of the woodland planting in this area has been refined to follow the existing topography and reflect the landscape character of the area. A key consideration here will be the need to ensure that impacts to the special qualities of the Kent Downs AONB are not impacted by the amendments.

2.6 In terms of the overarching environmental observations for the Updates 1-5 above (Page 14 of the Environmental Impacts Update report), given the direct loss of woodland habitat from the SSSI and work within these areas there is the potential for further air quality impacts. The Environmental Update Report refers back to the mitigation measures proposed within the PEIR but these do not provide any details of the measures to be implemented for the impacts to Shorne and Ashenbank Woods SSSI. As such, further clarity should be provided within the environmental statement on the measures to avoid impacts to the SSSI.

2.7 **Update 6 Reduced land take through Shorne Woods Country Park and additional landscaping**

The reduced land take from Shorne Woods Country Park (including areas within Shorne and Ashenbank Woods SSSI, the Kent Downs AONB and areas of ancient woodland) is welcomed. Natural England would however draw you attention to the requirements of the National Policy Statement for National Networks[1]. In particular Section 4.26 (the need to consider alternatives), Section 5.29 (development within a SSSI should not normally be permitted), Section 5.32 (consent for loss of ancient woodland should not normally be granted) and Sections 5.150-51 (development within an AONB should not normally be consented).

As such, full details of the measures to avoid impacts to the SSSI , AONB and ancient woodland should be explored within the environmental statement. If the Secretary of State is minded to grant consent, then a full and robust package to mitigate the harmful effects of the proposal must be provided. Unfortunately, details on the specific measures to be provided in this respect have not been provided. The mitigation measures proposed refer back to those proposed within the PEIR but as mentioned above, detailed measures were not included within this document.

During the operational phase, the Environmental Impacts Update states that 'The area of works would be replanted as far as practicable, however it is noted that not all vegetation loss can be replanted in its entirety'. Given the utilities diversions proposed within the SSSI, continued access for maintenance and repair is likely to be required. As such, these areas may not be suitable for ecological mitigation if they are to be subject to regular management. This should be fully reflected within the environmental statement and additional mitigation areas provided as appropriate.

Natural England would therefore recommend that much greater clarity on the measures proposed in respect of impacts to the SSSI are included within the environmental statement.

The Environmental Impacts Update report also highlights that 'The inclusion of this design change would increase the extent of habitat loss compared with that reported in the PEIR. It would involve vegetation clearance within the Shorne and Ashenbank Woods SSSI…'. Given the increased impacts now expected compared to those identified in the PEIR, it is unclear why the assessment of impacts and mitigation proposed remains the same as detailed within the PEIR. It would be helpful if clarity could be provided.

Given the concerns above, further clarity should be provided within the environmental statement on the measures to avoid impacts to the SSSI and the measures to mitigate the impacts should the Secretary of State grant consent.

Given the increased habitat loss from the Shorne and Ashenbank Woods SSSI, it is unclear how this will not result in greater landscape impacts compared to those reported within the PEIR. Similarly, no additional mitigation measures appear to be provided in respect of this greater impact to the Kent Downs AONB. As such, we recommend greater clarity is provided within the environmental statement.

2.8 **Update 7 Electricity substation landscaping**

The impacts of additional features such as the electricity substations and the amended landscaping within and in close proximity to the Kent Downs AONB should be considered cumulatively with all of the other additions to the project. A robust assessment of the impacts and avoidance and mitigation measures should be included within the environmental statement.

2.9 **Update 8 Refinements to Brewers Road green bridge**

It is reported that there would be a slight benefit to the landscape impacts from the

[1] https://www.gov.uk/government/publications/national-policy-statement-for-national-networks

movement of the combined road and green bridge six metres to the east but there is no detail provided.

The design of the green bridge has the potential to provide significant landscape, biodiversity and people and communities benefits if designed appropriately as part of an innovative approach to trying to mitigate the significant increased severance caused by the Lower Thames Crossing scheme. Natural England recommend that a more holistic, visionary approach to the design and use of green bridges across the scheme is taken.

2.10 **Update 9 Retaining wall added alongside HS1 land**

The Environmental Impacts Update report highlights that a retaining wall will be added along the High Speed 1 land but that there will be no changes to the effects and mitigation measures detailed within the PEIR. If this is a new structure not previously considered within the PEIR, then it should be considered cumulatively with other elements of the project to ensure that the mitigation measures proposed remain appropriate.

2.11 **Update 10 Refinements to Thong Lane green bridge over the A2**

Whilst it is unlikely that greater impacts from the movement of the combined road and green bridge to five metres to the west, the design of the bridge will be key element for the scheme.

As mentioned for the Brewers Road bridge, the design of the green bridge has the potential to provide significant landscape, biodiversity and people and communities benefits if designed appropriately as part of an innovative approach to trying to mitigate the significant increased severance caused by the Lower Thames Crossing scheme. Natural England recommend that a more holistic, visionary approach to the design and use of green bridges across the scheme is taken.

2.12 **Update 11 Refinements to the Thong Lane green bridge over the Lower Thames Crossing and a new informal parking area to the east**

The Environmental Impacts Update report highlights that there will be a slight improvement to the landscape and biodiversity impacts to those reported in the PEIR from the movement of the combined road and green bridge twenty metres north. Whilst the increased level of tree planting may provide benefits, the visual representation (Figure 3.15) within the Guide to design refinement consultation highlights that the woodland planting will be focussed to the south of the bridge. This does not appear to provide habitat or arboreal connectivity across Thong Lane to the blocks of woodland to the north of the bridge which link into the wider Shorne Woods complex. Given the stated aim of the mitigation to 'maximise the opportunities to increase the area's biodiversity value' Natural England recommends that clarity is provided on how greater habitat connectivity to the wider woodland network could be achieved.

As mentioned for the Brewers Road bridge, the design of the green bridge has the potential to provide significant landscape, biodiversity and people and communities benefits if designed appropriately as part of an innovative approach to trying to mitigate the significant increased severance caused by the Lower Thames Crossing scheme. Natural England recommend that a more holistic, visionary approach to the design and use of green bridges across the scheme is taken.

Whilst limited information is provided in relation to the informal car park proposed in this area, there is the potential for additional landscape and biodiversity impacts which should be considered more fully within the environmental statement.

2.13 **Update 12 LTC alignment raised, south of Thong Lane over the LTC**

Whilst it is stated that the alignment of the road will be raised by between two and three metres, it is unclear from the consultation documents whether this will mean the associated infrastructure (for example gantries and lighting columns) will be more prominent in the landscape. If this is the case, then a full assessment and details of the additional mitigation

measures for impacts to the Kent Downs AONB will need to be provided.

2.14 **Update 13 Refining the land required for utility diversions**
Whilst the reduction in working area within Shorne and Ashenbank Woods SSSI, the Kent Downs AONB and Claylane Woods ancient woodland is acknowledged, significant impacts to these features will still result. The National Policy Statement for National Networks places a strong presumption against proposals that will impact these environmental assets and the project will need to demonstrate fully how all alternative options have been explored to avoid impacts.

As mentioned previously, should the Secretary of State be minded to grant consent for the scheme despite the significant adverse impacts to these features a comprehensive and robust mitigation package will be required. Reference is made to the measures detailed within the PEIR but these are not specific and a much greater level detail should be provided as part of the environmental statement and should not be deferred to the post consent stage.

2.15 **Update 14 Upgrade works for the existing overhead electricity distribution cables**
It is not clear what, if any additional impacts will result from these proposals as the Environmental Impacts Update does not provide sufficient clarity. As such, we are not able to provide advice at present on this amendment.

2.16 **Update 15Refined gas alignment along Valley Drive**
Natural England has no observations to make on this amendment.

2.17 **Update 16 New permanent electricity switching station, Thong Lane**
Despite the Environmental Impacts Update report confirming that the addition of the switching station would result in a worsening of the landscape impacts and greater loss of habitat, no additional mitigation measures have been proposed. As mentioned previously, the addition of these features should be considered cumulatively with all other elements of the scheme and a robust impact assessment and mitigation strategy provided.

2.18 **Update 17 Refinement to the overhead electricity transmission cable diversion at Thong Lane**
Despite the Environmental Impacts Update confirming that the moving of the transmission cable south would result in a worsening of the landscape impacts, no additional mitigation measures have been proposed. As mentioned previously, the addition of these features should be considered cumulatively with all other elements of the scheme and a robust impact assessment and mitigation strategy provided.

3 Design Refinements Tilbury Area

3.1 **Update 18 Northern tunnel entrance landscaping proposals**
Natural England notes the intention to restore the area around the northern portal to a 'grazing agricultural use'. We understand that previous restoration schemes for the Goshem's Farm landfill site were originally intended to achieve a grazed area, consistent with the desire to achieve a conservation-led after use with certain target species in mind. In particular, the hornet robber fly *Asilus crabroniformis* (a Section 41 priority species) was previously known from this area. Its hunting requirements target animal dung as a forage resource for prey species such as dung beetles etc., but it has declined significantly due to increased use of chemical insecticides such as ivermectins which are known to have lethal or sub-lethal effects on species such as the hornet robber fly. In our view therefore, the use of this area for 'conservation grazing' would be appropriate so long as a carefully designed low intensity (extensive) regime could be implemented, and set within a management plan for the area.

Although in our opinion the proposed after use is consistent with earlier management aspirations for this site, it remains important for the environmental masterplan to consider the wider range of opportunities presented by the scheme in this location. For example, the

Goshem's Farm area is large, and includes areas in close proximity to post-industrial brownfield areas with known nationally important invertebrate assemblages. This, combined with a ready supply of pulverised fuel ash (PFA) from adjacent stockpiles presents an opportunity to expand a PFA substrate habitat creation area (for example within the south-western corner) to bolster the overall habitat resource in this area.

The maps provided as part of the Design Refinement consultation indicate that an area of the Goshem's Farm Conservation Area is included within the updated boundary. We understand this area to amount to approximately 1.5 hectares, and whilst we had previously welcomed the exclusion of the Conservation Area from earlier versions of the DCO boundary, we were not aware that the exclusion did not include all of the area identified within linked planning permissions and safeguarded for conservation purposes. Similarly, this remnant portion does not appear to have been to during Design Workshop meetings. We do note that the boundary in this area was proposed at the Supplementary Consultation stage, however this change was not specifically highlighted in the Environmental Impacts Update report for the Supplementary Consultation. Natural England would strongly endorse an adjustment to the boundary in this location so as to exclude the entirely of the Goshem's Farm conservation area.

3.2 **Update 19 Northern tunnel entrance layout**

Natural England notes and broadly welcomes the reduction in culvert length from 80m to 60m. Whilst it is stated that this will enable wildlife to navigate the culvert 'more easily', and we acknowledge that this is an improvement on an 80m design, navigation of a 60m culvert will clearly remain challenging for much wildlife. The statement that this reduction will 'minimise' the impact on local ecology appears to be misleading. We are not aware that evidence has been presented to demonstrate that culverts of this length have been successfully built for other projects that can point to successful monitoring studies showing that such a long culvert is not in fact a barrier to species movements. Further information should be provided to justify the statement made in this section.

3.3 **Update 20 Realignment of footpath 61**

Natural England has no specific comments to make in relation to this change at present.

3.4 **Update 21 Realignment of footpath 200**

Natural England has no specific comments to make in relation to this change at present.

3.5 **Update 22 Muckingford Road realigned and widened**

Natural England has no specific comments to make in relation to this change at present.

3.6 **Update 23 Tilbury watercourse**

Natural England notes that the scheme proposes to re-establish water flow within the watercourse and it would be helpful if further clarity were provided on how this will be achieved.

3.7 **Update 24 New water supply from Linford borehole and a local water main**

Natural England has no specific comments to make in relation to this change at present.

3.8 **Update 25 Potential upgrade of existing water network**

Natural England has no specific comments to make in relation to this change at present.

3.9 **Update 26 Multi-utilities provision to the construction site and norther tunnel entrance**

Natural England has no specific comments to make in relation to this change at present.

4 A13/A1089 Area

4.1 **Update 27 A13/A1089 landscaping proposals and watercourse diversion**

Natural England notes the change to include public access to the woodland. It is not clear

whether the woodland to be lost in this area had a baseline of public access, in order to inform a proper comparison. Public access introduces a range of impact pathways (such as trampling of ground flora, increased nutrients due to dog fouling etc.) that should be properly assessed within the environmental statement in order to justify the conclusion reached.

4.2 **Update 28 Removal of a false cutting**
Natural England has no specific comments to make in relation to this change at present.

4.3 **Update 29 Change to two A13 merge layouts**
Natural England has no specific comments to make in relation to this change at present.

4.4 **Update 30 Amendments to shared paths in the A13/A1089 area**
Natural England has no specific comments to make in relation to this change at present.

4.5 **Update 31 Traveller site relocation**
We note the new location proposed for the travellers site is expected to increase the area of habitat loss. However the Environmental Update report does not describe the type of habitat, its quality, or where mitigation will be provided.

4.6 **Update 32 Multi-utility diversion extension along the B188 High Road**
Natural England has no specific comments to make in relation to this change at present.

4.7 **Update 33 Moving overhead electricity distribution cables underground**
As mentioned in the overarching comments, greater impacts to biodiversity are mentioned within the Environmental Impacts Update but no details of these are provided so it is difficult for consultees to provide advice.

4.8 **Update 34 Permanent gas pipeline compound at Stanford Road**
The Environmental Impacts Update suggests that there will be an increased loss of habitat but that no additional mitigation measures are required. It would be helpful if clarity were provided on why no additional mitigation measures are required.

4.9 **Update 35 Additional land for overhead electricity distribution cable diversion works**
The Environmental Impacts Update suggests that there will be an increased loss of habitat but that no additional mitigation measures are required. It would be helpful if clarity were provided on why no additional mitigation measures are required.

4.10 **Update 36 Additional working area for multi-utility construction**
The Environmental Impacts Update suggests that there will be an increased loss of habitat but that no additional mitigation measures are required. It would be helpful if clarity were provided on why no additional mitigation measures are required.

5 LTC/M25 Area

5.1 **Update 37 Reduced woodland compensation area north of the Thames Chase Forest Centre**
It would be helpful if clarity were provided on why the area of compensation habitat has been reduced but the expected effects confirm that ‘there would be a slight increase in working area…and could add to the nature of the effects reported in the PEIR due to the potential loss of habitat…’.

5.2 **Update 38 Reduced woodland planting within The Wilderness**
It is not clear why the reduction in woodland planting is not considered likely to have an effect on the assessment. For example, the report does not state whether this woodland planting was required to compensate for other losses or was intended as a biodiversity gain. Consequently, it would be helpful if clarity were provided.

5.3 **Update 39 Modifications at Ockendon landfill (south of the Lower Thames Crossing)**
It is unclear why the biodiversity mitigation has been updated, if the assessment of effects is not expected to change.

5.4 **Update 40 Relocation of construction site 13**
Whilst there is an increase in the working area which could add to the nature of the biodiversity impacts, no further mitigation measures are proposed. It would be helpful if clarity were provided.

5.5 **Update 41 Relocation of footpath 136**
Natural England has no specific comments to make in relation to this change at present.

5.6 **Update 42 Relocation of footpath 252**
Natural England has no specific comments to make in relation to this change at present.

5.7 **Update 43 Proposed reconfiguration of land required for multi-utility works**
Natural England has no specific comments to make in relation to this change at present.

5.8 **Update 44 B186 North Road multi-utility diversion works**
Natural England has no specific comments to make in relation to this change at present.

5.9 **Update 45 Ockendon Road sewer diversion works**
Natural England has no specific comments to make in relation to this change at present.

5.10 **Update 46 Works in the Mardyke area for National Grid maintenance access**
Natural England has no specific comments to make in relation to this change at present.

6 M25 Junction 9

6.1 **Update 47 Amendments to walking, cycling and horse-riding routes**
Natural England has no specific comments to make in relation to this change at present.

6.2 **Update 48 Additional land for underground electricity distribution cable works**
Given the increased area of habitat loss, it would be helpful if clarity were provided on why no additional mitigation measures are proposed.

6.3 **Update 49 Overhead electricity distribution cables repositioned underground**
Given the increased area of habitat loss, it would be helpful if clarity were provided on why no additional mitigation measures are proposed.

6.4 **Update 50 Additional land required for gas diversion works**
The Updated Environmental Impacts report suggests that the biodiversity mitigation remains as detailed in the PEIR but also suggests that it has been updated and designed appropriately; it would be helpful if clarity were provided on the additional measures proposed.

6.5 **Update 51 Additional land for maintenance of the overhead electricity transmission cables**
Natural England has no specific comments to make in relation to this change at present.

6.6 **Update 52 Additional land for multi-utility works**
Natural England has no specific comments to make in relation to this change at present.

7 Project wide updates

7.1 **Update 53 Drainage Ponds**
Natural England has no specific comments but would recommend that these ponds are designed to incorporate ecological features as part of the project wide ecological

enhancement strategy.

7.2 **Update 54 Flood mitigation zones**
Natural England has no specific comments to make in relation to this change at present.

7.3 **Update 55 Noise barriers**
Page 29 of the Guide to the design refinement consultation details that a number of noise barriers are to be installed along the route.

Two of these barriers, between 400 and 600 metres in length are now to be included within the Kent Downs AONB but no additional impacts are predicted. The Environmental Impacts Update states for the A2/M2 Junction that 'Although they introduce a new built element and may introduce new visual receptors, there would be no change in the nature of the effects or mitigation measures reported in the PEIR'. Natural England is concerned with this assessment given these significant additional structures being located within the AONB and would recommend that a robust assessment of these additional elements and any further mitigation measures required is provided within the environmental statement.

In addition, from the plans provided (Page 29 of the Guide to the design refinement consultation), it would also appear that two of these noise barriers fall with, or in very close proximity to the Shorne and Ashenbank Woods SSSI. Further clarity on the additional impacts and mitigation measures in respect of the SSSI should therefore be provided.

It is also unclear whether the noise barriers proposed along whole route will impact wildlife movement and again greater clarity should be provided through an assessment within the environmental statement.

7.4 **Update 56 Substations**
Given the increased land required for the substations and their locations, any additional biodiversity and landscape impacts and necessary mitigation measures should be fully detailed within the environmental statement.

7.5 **Update 57 Maintenance access tracks and maintenance bays**
Given the increased land required for the access tracks and maintenance bays, any additional biodiversity and landscape impacts and necessary mitigation measures should be fully detailed within the environmental statement.

Annex C.4 Natural England Community Impact Consultation Response

Date: 08 September 2021
Our ref: 360522
Your ref: -

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Crewe Business Park
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CW1 6GJ

T 0300 060 3900

[redacted]

By email (no hard copy to follow) to [redacted]

Dear [redacted]

Lower Thames Crossing Community Impacts Consultation July 2021

Thank you for your consultation on the above dated 13 July 2021 which was received by Natural England on the 19 July.

Natural England welcomes the opportunity to provide comments on the various documents included as part of the Community Impacts Consultation. For ease, we have provided our advice on each document separately in the annex to this letter.

Natural England would like to recognise and endorse the journey and collaborative approach that we have continued with the Project Team since the withdrawal of the application in late 2020. The delay has allowed us to work closely with the Team to resolve many areas of concern and help ensure a more holistic approach to considering the environmental mitigation for impacts resulting from the project.

The advice in our response to the Community Impacts Consultation and associated documents are provided in the spirit of collaborative working and we hope they are helpful to National Highways in realising a truly exemplar, sustainable development project which delivers a visionary environmental legacy for people and wildlife.

Key to realising this will be a landscape scale approach to mitigating the environmental impacts of the project and providing environmental gains if the scheme is consented. There are significant opportunities for such an approach along the A2 corridor including the Shorne and Ashenbank Woods Site of Special Scientific Interest and the Kent Downs Area of Outstanding Natural Beauty to the south of the River Thames and Tilbury Fields to the north.

We will be pleased to continue working with the Project Team over the coming months to help realise this ambition and to work with you and your colleagues to try and ensure our comments below can be fully resolved as the Project progresses towards submission.

I trust these comments are helpful but if there are any queries relating to the specific advice in this letter only please contact [redacted]. For any new consultations, or to provide further information on this consultation please send your correspondences to [redacted].

Yours sincerely

[redacted]

Annex A: Natural England's detailed advice in relation to the Lower Thames Crossing Community Impacts Consultation, July 2021

1 Guide to Community Impacts Document

1.1 Natural England welcomes the broad commitment to creating an environmental legacy, although we are disappointed that this is not included as one of the project's stated aims. Given the sensitive locations that this scheme passes through and the significant environmental impacts, as well as the opportunities for nature recovery, Natural England would recommend a strong environmental objective at the project level is included. Such an approach would also be in accordance with the Government's 25 Year Environment Plan.

However, we recognise National Highways commitment to achieving no net loss in biodiversity by the end of 2025 and its intention to work towards net biodiversity gain by 2040 across its estate. We are committed to working with National Highways to ensure that the project minimises and mitigates its environmental impact, together with ensuring a significant package of additional measures is secured to achieve a lasting environmental legacy.

We notes that page 52 details'… our design has tried to provide biodiversity gains wherever possible', and that elsewhere in the consultation documents (for example Page 248 of the Construction Update) there is the statement that 'Enhancements made to non-designated habitats along the Lower Thames Crossing are likely to increase the biodiversity value by at least 15%.' Natural England would encourage a clear commitment by the project to achieving net gain, however, of particular importance is ensuring that the environmental measures provide biodiversity enhancements as part of a strategic approach to nature recovery at the landscape scale.

1.2 Natural England notes that the Legacy and benefits section on Page 11, detail the 'replanting 6 square metres for every square metre of ancient woodland lost'. Ancient woodland is an irreplaceable habitat receiving strong policy protection in the National Policy Statement for National Networks along with the National Planning Policy Framework. Whilst Natural England does not support the loss of ancient semi-natural woodland, including areas from within designated sites, should the Secretary of State be minded to grant consent for this project we would expect a substantial compensation package to be provided. This should consider both the area to be created and the functionality of the habitat that is to be created, through linking existing areas of woodland for example rather than being a ratio based approach. Natural England welcomes the ongoing discussions we are having with he Project Team and hope to continue this as the scheme progresses.

1.3 Natural England notes that Page 26 refers to the proposals for Tilbury Fields which Natural England broadly supports and are keen to continue working with the Project Team to maximise the biodiversity value of this area as part of National Highways aspirations for this area.

1.4 Natural England notes that Page 52 details'… our design has tried to provide biodiversity gains wherever possible'. The Project has publicly committed to achieving a 15% biodiversity net gain[1] so it would seem appropriate for this to be reflected within the project commitments for the updated environmental statement to clearly demonstrate how this has been incorporated into the revised design.

1.5 The Landscape and visual section on Page 55 details that the project will have 'temporary changes to characteristics… of the Kent Downs AONB [Area of Outstanding Natural Beauty]'. Natural England considers that the impacts to the AONB will be long-term and from discussions with the Project Team understand that there will be significant adverse residual landscape and visual impacts at year 15. We remain keen to work with the Project

[1] https://www.gov.uk/government/news/highways-england-seeks-partners-to-build-19-billion-lower-thames-crossing-roads

Team to try and resolve our significant concerns in relation to the impacts the scheme will have for the AONB.

1.6 Natural England notes that the 'Operations Update (Chapter 6) does not appear to provide an update on the biodiversity effects of the operational phase but appreciate that some of these are included within the Operations Update document itself. Such effects could result from impacts including, but not limited to, habitat severance, air quality impacts and lighting for example. Similarly, there is relatively little information provided in relation to any residual landscape effects during the operation phase which we would have expected to be provided.

2 Lower Thames Crossing - Ward impact summaries south of the river

2.1 Natural England has no specific comments to make in relation to the Ward impact summaries south of the river but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments.

3 Lower Thames Crossing – Ward impacts summaries north of the river

3.1 Natural England has no specific comments to make in relation to the Ward impact summaries south of the river but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments.

4 Lower Thames Crossing – You said, we did

4.1 Natural England has no specific comments to make in relation to the 'You said, we did' document but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments.

5 Lower Thames Crossing Construction Update Report

5.1 Natural England welcomes confirmation on Page 16 that the second iteration of the Environmental Management Plan (EMP2) would be submitted to the Secretary of State for approval following 'consultation with the relevant local authorities and Natural England'.

5.2 Section 2.7 provides information in relation to the location of the Utility Hubs. From the plans accompanying the consultation, the Park Pale Lane, A2 West and Shorne Ifield Road Utility Hubs appear to be in locations where compensatory woodland planting is proposed. Natural England considers that, given the time for woodland to establish any woodland creation should be created as early in the project as possible and preferably before the impact, particularly for impacts to ancient and semi natural and SSSI woodland if soil translocation is to be undertaken. If the areas do overlap, it would be helpful if clarity on how the timetabling of the habitat creation and the Utility Hub elements will be undertaken to ensure they do not cause conflict.

5.3 Natural England welcomes the aspiration to maximise the ecological contribution of the area known as Tilbury Fields, and the positive approach the Project team is taking to providing important biodiversity habitat. This area has the clear potential to provide an important ecological linkage between areas of known high quality for invertebrates, in particular to the west and east, and we support the design of this area to align with the landscape-scale objectives for this area as a node for nature conservation. Whilst the invertebrate interest is of particular importance, we would also encourage the Project to look at opportunities to restore (and where possible enhance) riverside habitats that are now scarce in this area.

The proposals for Tilbury Fields demonstrably contribute towards nature recovery by facilitating habitat connectivity along the Thames corridor and align with the strategic objectives for biodiversity in this area, showing that the project has recognised the

importance and value of the Thames Estuary invertebrates and is prepared to deliver in line with the scale and ambition of the project.

We note that the options contained in the consultation documents for disposal of construction arisings have maximum heights of either 16.5 or 22.5metres – we have no specific preference as we consider the aspirations for the biodiversity potential for this area could be achieved within either scenario. We would advise that it is more important to consider features such as the placement, accessibility and aspect of critical substrates in this area rather than the overall height of the landform.

We are committed to working with the Project and other stakeholders to continue to advise on the outcomes for this area, and we welcome the helpful and collaborative approach taken by National Highways and the Project Team in unlocking a solution and moving the project towards sustainable development.

.Natural England broadly welcomes the examples of the proposed monitoring detailed within Section 2.11. We would however recommend that the monitoring will also need to also include water quality to ensure that the chemical parameters agreed for discharge of the surface water from the construction compound to the South Thames Estuary and Marshes Site of Special Scientific Interest and the Thames Estuary and Marshes Ramsar Site are not exceeded.

5.4 Section 3.3 'Initial Works' (page 73) suggests that ecological mitigation will be undertaken in the first year as part of the initial works including habitat creation. As mentioned above, some of the woodland creation areas appear to be in the same locations at the utility logistic hubs so it may be appropriate for greater clarity on the timings to ensure there is no conflict.

5.5 Information on the required diversion of Southern Gas Networks pipeline provided on Page 85 details that 'The diverted utilities corridor to the north of the A2/M2 limits opportunities for tree planting. However, the areas are south facing and we would create a chalk grassland habitat once the works are finished'.

Natural England understands that a considerable part of the working area for the utility diversion falls within the boundary of the Shorne and Ashenbank Woods SSSI and the creation of chalk grassland may result in greater impacts to the designated site. It would be helpful for greater clarity to be provided on how measures to avoid impacts to the designated site have been considered and, where this is not possible, how the habitat within the SSSI will be restored should consent be granted.

5.6 Page 88 of the report details that for the A2/M2 junction 'Ecological work, including the moving of species, would take place at the start of the construction while some landscaping and environmental mitigation would happen towards the end of the programme'. It would be helpful for clarity to be provided on what areas will be created when, particularly given the sensitive landscape in which this part of the scheme sits and the time taken for habitats, particularly woodland, to meet their target ecological condition. Such information would be helpful for the habitats impacted and to be created along the entire route.

5.7 Given the linear nature of the project, the scheme will result in significant severance of the landscape for people and wildlife along its length and the proposed use of green bridges to link the landscape is welcomed in principle. Key to their success in avoiding severance of the landscape and habitats will be their location, design and connectivity into the landscape and wider habitat networks either side of the route for people and wildlife.

5.8 Natural England notes that for the Milton Construction Compound (for the ground protection tunnel should this be required) mentions on Page 117 the need for bullet proof barriers and hoarding around the site but no detail is provided. Given the construction compound lies in close proximity to the SSSI and Ramsar site, depending upon the nature of these barriers there may be additional impacts to birds associated with the designated sites which we

recommend should be reflected within the updated Environmental Statement.

5.9 Natural England notes that the Air Quality section (Page 202) refers to the consideration of NO_2 and PM_{10} but does not include ammonia which Natural England understands is also being modelled as part of the revised Environmental Statement following discussions with National Highways. We will of course be pleased to provide advice on the implications for designated sites once the results of this modelling are available to share with us.

5.10 Figure 7-9 'Noise sensitive receptors' seems to focus primarily on human receptors. The birds associated with the coastal designated are also sensitive to noise disturbance and it would be helpful for this to be reflected.

5.11 Natural England notes the proposal for the proposed haul route at Fort Road which falls in close proximity to an area of importance for non-breeding birds and Figure 7-11 (Page 222) indicates there will be an increase in noise associated with the vehicle movements. It will be important for the Environmental Statement to assess these impacts and we will aim to work with the Project Team in the near future to better understand the potential disturbance to birds and the measures that are to be implemented to mitigate these.

5.12 The 'Terrestrial Biodiversity' section on Page 247 appear to refer to the loss of invertebrate habitat north of the Thames only. From previous discussions Natural England understand that the surveys undertaken for the project have also identified important assemblages of invertebrates south of the Thames in Shorne and Ashenbank Woods SSSI (the SSSI itself is also notified for invertebrates) and we would recommend that the Environmental Statement considers the impacts of the scheme to invertebrates north and south of the Thames Estuary.

5.13 Natural England welcomes the Project's commitment to delivering environmental gains (Page 248), whilst acknowledging the significant environmental impacts that the scheme will cause to irreplaceable habitats and designated sites. The comparison of the area created versus the area lost does not necessarily equate to biodiversity gain, particularly given that ancient woodland is an irreplaceable habitat. It will depend on a number of factors including the quality of habitat lost versus that being created and the time lag to reach target ecological condition. We would recommend that the Defra Biodiversity Metric is used to calculate the biodiversity gain rather than a percentage increase in habitat within the Environmental Statement.

Given the direct impacts to the Shorne and Ashenbank Woods SSSI and areas of irreplaceable ancient woodland habitat, caution will need to be taken in the consideration of biodiversity net gain. The Explanatory Note to the Environment Bill[2] provides some helpful guidance on net gain in relation to irreplaceable habitats and designated sites in Paragraphs 1574 and 1575 which may be helpful when revising the Environmental Statement.

5.14 On page 249 we note the description of the discharge outfall within an area of important inter-tidal habitat outside of the designated area (but functionally linked to it) which could result in impacts. Natural England has provided further advice on these works within our comments on the Code of Construction Practice section of this advice letter.

5.15 Page 250 confirms, that with the implementation of proposed mitigation measures, no likely significant effects are predicted on marine biodiversity during construction. We are continuing to work with the Project Team, through the Habitats Regulations Assessment discussions, on whether impacts to the marine environment could have implications for the Thames Estuary and Marshes Special Protection Area and Ramsar site and would recommend the Environmental Statement is updated following these discussions.

5.16 The 'Landscape and visual effects' section on Page 257 details that the visual and

[2] Available to download from https://publications.parliament.uk/pa/bills/cbill/58-01/0009/en/20009en.pdf

landscape character impacts from construction activities to the Kent Downs AONB would be temporary. Whilst the construction compounds, plant and machinery and the construction works themselves are not permanent (but will last for a period of up to seven years), the removal of habitats including ancient and seminatural woodland from within the AONB at the start of the construction will not be temporary given the long-lasting changes to landscape character and visual receptors. As such, Natural England considers that this should be considered a permanent change to the landscape character of the AONB.

6 Operations Update

6.1 Figure 2-8 'Proposed new, realigned and improved public rights of way' appear to show improvements to the public rights of way network within Shorne and Ashenbank Woods SSSI south of the A2. It is unclear whether these will result in greater land take from the designated site or what additional impacts could result from, for example surfacing. It would be helpful, should these fall within the SSSI, for greater clarity to be provided within the Environmental Statement.

6.2 The limits of deviation are referred to on Page 31. We have been unable to locate plans showing the limits of deviation which would be helpful, aiding stakeholders in being able to fully understand the likely scale of the impacts that the limits of deviation would permit. It would be appreciated if such a plan were submitted with the Environmental Statement.

7 Map Book 1 General Arrangements

7.1 The plans show the areas of woodland planting between Brewers Wood and Great Crabbles Wood (and all other woodland planting areas) as 'potential' areas for ancient woodland (and presumably the Shorne and Ashenbank Woods SSSI) compensation areas.

Whilst Natural England does not support the loss of ancient semi-natural woodland, including areas from within designated sites, should the Secretary of State be minded to grant consent for this project we would expect a substantial compensation package to be provided.

Given the irreplaceability of ancient woodland, a high degree of confidence in any replacement woodland measures proposed should be provided and the project should clearly demonstrate how measures to avoid and mitigate impacts to ancient woodland and designated sites have been fully exhausted. Natural England therefore recommends that a much higher level of confidence in the proposals should be provided as part of the updated Environmental Statement.

We would also expect a clear distinction to be made for the areas that are proposed for impacts to the SSSI and other areas of ancient and seminatural woodland.

7.2 Natural England notes that the proposed species mitigation areas north and south of the A2 detailed in the plans (as highlighted by the purple shading) fall within the Shorne and Ashenbank Woods SSSI. This information appears different to the mitigation measures discussed for dormouse within Shorne Woods Country Park (part of Shorne and Ashenbank Woods SSSI) so it would be helpful if clarity were provided on the apparent difference.

7.3 General arrangement plan Sheet 4 shows that woodland mitigation planting to the west of Henhurst Road and south of the A2 will be isolated woodland, so we consider it's ecological functionality will be severely limited. One of the key ecological principles of ancient and seminatural woodland compensation (in the exceptional situations where impacts cannot be avoided) is that it should aim to provide habitat connectivity rather than create isolated blocks of woodland. Natural England recommends that greater clarity is provided on the landscape scale connectivity for all habitats that are to be impacted and compensated for as

part of the project.

7.4 Sheet 9 (and the visualisation for the Thong Lane Green Bridge Proposed across the Lower Thames Crossing (sometimes referred to as 'Thong Lane north') appear to indicate that there will be limited habitat connectivity provided between Claylane Wood and Shorne Woods Country Park. The planting on the bridge itself appears to be scattered trees, whilst to the east and west of Thong Lane the proposed woodland planting is limited with significant areas of grassland and other land use types present. The bridge does not appear to provide habitat linking Claylane Wood to the east into the extensive woodland within Shorne and Ashenbank Woods SSSI. It would seem appropriate for the landscaping strategy to consider how the isolated Claylane Woods could be truly reconnected, either through woodland or scrub/thick hedgerow planting being mindful of the landscape character around Thong village.

7.5 The plans again seem to indicate that the Utilities Logistic Hubs will be located in 'potential' woodland compensation areas, in particular the significant block proposed to the north of the Shorne Ifield Road. It would be helpful for clarity to be provided on how the use of these areas affects the timetable for the establishment of the compensatory woodland habitat and the implications this has for the habitats to reach the target condition.

8 Engineering plans

8.1 Natural England has no specific comments to make in relation to the Engineering Plans at present but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments.

9 Land Use plans

9.1 Natural England has no specific comments to make in relation to the Land Use Plans at present but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments.

10 Framework construction travel plan

10.1 Natural England has no specific comments to make in relation to the Framework construction travel plan at present but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments.

11 Outline site waste management plan

11.1 Natural England has no specific comments to make in relation to the Outline site waste management plan at present but instead have provided comments on the environmental impacts, mitigation and opportunities relevant to our remit across the scheme within our wider comments

12 Outline Landscape and Ecology Management Plan

12.1 Section 1.14 of the Outline Landscape and Ecology Masterplan (OLEMP) details that 'The LEMP submitted to the SoS for approval must be substantially in accordance with the outline LEMP, including the habitat management requirements, targets and prescriptions set out in the outline LEMP. It may be appropriate for greater clarity to be provided on what the levels of deviation from the OLEMP may be acceptable; for example it might be appropriate to ensure no reduction in the commitments within the OLEMP to give confidence that the environmental outcomes will remain the same or better for the project.

12.2 Natural England welcomes the commitment within Section 1.4.9 regarding the habitat creation following published good practice guidance. In addition to published good practice,

we would also recommend that lessons learnt from other projects (both highways and other developments) feed into the detailed design. This should include details on the habitat creation and the monitoring proposed to ensure that the replacement habitat achieves its target ecological condition both in terms of the habitat and the species it supports. Lessons learnt from projects such as the A21 Pembury to Tonbridge dualling would seem appropriate to incorporate into the Lower Thames Crossing project.

Natural England will of course be pleased to provide further advice on the replacement habitat design and creation along with the monitoring strategy and feel that an Environmental Advisory Group could be a useful approach for such discussions and agreement to be reached.

12.3 Natural England notes that in Table 1 (Management Matrix Table), the habitats proposed for the 'land east of Brewers Wood (AWC [ancient woodland compensation]) will comprise a mixture of species rich grassland, waterbodies and ancient woodland compensation. Given the direct loss of ancient woodland (including areas from within the Shorne and Ashenbank Woods SSSI), it is important that clarity is provided on how the impacts to these (and other habitats of conservation importance) will be fully addressed should consent be granted. It may be appropriate for clarity to be provided within the OLEMP or further detail to be included within the Environmental Statement.

12.4 Natural England welcomes the commitments within Section 2.3.2 of the OLEMP which details the following:

'In addition to the Design Principles, this outline LEMP has been produced to ensure the new features meet the following broad objectives:

a) Nature conservation and biodiversity – to provide new biodiverse habitats throughout the Project which connect to each other and to existing retained habitat, forming a green corridor along the length of the Project.
b) Landscape integration – to reflect the surrounding landscape character that the Project route passes through.
c) Visual screening – to screen views of the Project route and infrastructure from existing (and future) visual receptors.'

Given the severance impacts that the linear nature of the scheme will result in, it is important for the project to ensure connectivity both across the transport corridor and along the route length given the impacts that upon both habitat and landscape connectivity. Whilst the inclusion of green bridges is welcomed, their design needs to ensure that landscape scale connectivity is achieved; we are keen to more fully explore the design and connectivity of the bridges more fully with the Project Team. Given the scale of the severance, a holistic landscape led approach to re-connecting the landscape should form a key component of the project design.

The objectives in relation to landscape integration and visual screening are welcomed. From our discussions with the Project Team, we understand that the project will result in significant residual adverse landscape impacts in relation to the Kent Downs AONB so it would seem appropriate for the project to undertake further work to ensure the project is integrated into the nationally important landscape it travels through and to further moderate these adverse effects. Natural England will of course be pleased to provide further advice to the project in relation to the Kent Downs AONB.

12.5 Natural England notes that Section 3 (Implementation of the Landscape and Ecology Management Plan) provides information on the anticipated duration for the establishment of the various landscape and ecological features to be created. In addition to the habitat establishment, the long-term management and monitoring of all features created to mitigate and compensate for the environmental impacts of the project will be key to their success and it may be appropriate to include reference to this within the OLEMP. Natural England will be pleased to provide further advice on the detailed habitat establishment, management and

monitoring proposals as the scheme progresses.

12.6 Natural England supports the proposed Advisory Group detailed within Section 3.1 to help inform the actions and outcomes that the LEMP will deliver through during the pre-construction, construction and operational phases of the project and will be pleased to be a member of this group.

12.7 Natural England has prioritised our comments on the management proposals for sections of the scheme within the OLEMP where we feel we can provide helpful comments or opportunities.

12.8 In relation to the A2/M2 Corridor (Section 4.2), Natural England welcomes the broad management commitments detailed within Section 4.2.5 in respect of the AONB, designated site and other nature conservation impacts.

12.9 Section 4.2.5 (a) proposed measures details 'To provide suitable woodland to screen views from within the Kent Downs AONB'. It would be helpful for clarity to be provided on what 'suitable' woodland means given the need for the screening to be sensitive to the landscape character of this part of the Kent Downs. Care will need to be taken in designing the planting to ensure that further impacts to the Kent Downs AONB do not result from these mitigation measures through unintended changes to the landscape character.

In addition, we note that the information provided within the Design Principles proposes some non-native species for a number of the woodland planting palettes. Given the impacts to ancient woodland, including areas within the Shorne and Ashenbank Woods SSSI, we would recommend that, if consent is granted, the habitats that are to be provided should reflect those directly impacted. It is welcomed that the Section 4.2.5 of the OLEMP confirms that native species of local provenance are to be planted it would be helpful if greater clarity could be provided on the apparent differences between the OLEMP and the Design Principles.

12.10 Section 4.3 of the OLEMP provides details of the proposals for the 'Land East of Brewers Wood (Ancient Woodland Compensation)'. This area, which falls within the AONB, is predominantly grassland with a scattered trees providing a parkland type feature. Care will need to be taken to ensure that the proposed woodland and grassland creation does not result in additional impacts to the Kent Downs AONB by adversely affecting the landscape character or views.

12.11 As a general comment, it would be helpful for the Environmental Statement to provide clarity on the areas of woodland planting which are proposed for impacts to the SSSI and other areas of ancient woodland separately. This would allow greater clarity to be provided on the scale of impact and the proposed compensation measures to the SSSI and the wider series and broader areas of ancient woodland proposed should the Secretary of State grant permission.

12.12 One of the important considerations for ancient woodland compensation will be the functionality of the replacement woodland and a key component of this will be the connectivity of the woodland. Section 4.4 of the OLEMP (land west of Jeskyns Farm, ancient woodland compensation) details that an area of woodland planting to offset the loss of ancient woodland is proposed to the south of Church Road and west of Henhurst Road. This area of proposed woodland appears to provide limited connectivity to the wider wooded landscape so it would be helpful if further clarity were provided on how the functionality of the replacement woodland habitat will be secured. Natural England recommends a strategic, landscape scale approach to the habitat compensation planting is provided as part of the revised Environmental Statement.

12.13 Section 4.5 of the OLEMP (Green Bridges (Brewers Road, thong Land over A2 and Thong Lane over the Lower Thames Crossing) provides details of the proposed management of the

green bridges. Natural England is supportive of the provision of the green bridges in principle and consider that there are significant opportunities for them to truly connect the landscape within the Kent Downs AONB and its setting for people and wildlife with a more visionary design. At present the design and linking habitat provides limited habitat connectivity across the widened transport infrastructure including the High Speed 1 rail line; the impact of which is increased by the removal of much of the mitigation planting implemented previously.

Natural England is keen to continue working with the Project Team to explore opportunities for a more innovative design for the green bridges which provides a high quality user experience for recreational users within the Kent Downs, truly linking the severed landscape for people and wildlife. Key to the success of the green bridges success in avoiding severance of the landscape (and for wildlife) will be their location, design and connectivity into the landscape and wider habitat networks either side of the route. Natural England also considers that a more visionary design will also help moderate some of the landscape impacts in the AONB.

12.14 Natural England supports the opportunities that Chalk Park will provided for people to recreate and engage with the natural environment (Section 4.6, open space north of Claylane Wood).

12.15 In relation to the proposed woodland plant to the north of Brummelhill Wood (Section 4.9), Natural England would welcome clarity on which areas of woodland creation are being proposed to replace the loss of habitat from within the Shorne and Ashenbank Woods SSSI and other areas of ancient woodland separately. This will allow us to be able to provide more detailed advice on the proposed compensation measures for the SSSI and broader SSSI series should consent be provided by the Secretary of State.

12.16 In relation to the Gateway to Shorne Woods Country Park (Section 4.10), Natural England is keen to continue working with Kent County Council (as owners of the park) and the Lower Thames Project Team to more fully explore the proposals for this area.

12.17 Section 5.2 of the OLEMP provided information on the proposals for Tilbury Fields; Natural England broadly supports the aspirations for this area and are keen to continue working with the Project Team to maximise the biodiversity value of the this area and to provide advice on the management proposals as the scheme progresses.

12.18 Section 5.3 (Coalhouse Fort) area of the OLEMP details that the outline management proposals for this area are being refined. Natural England understands that this area is likely to be used to provide replacement habitat for feeding and roosting wintering bird species associated with the coastal designated sites. We will be pleased to continue working with the Project Team on the proposals for this area as they evolve.

12.19 Section 5.4 provides details on the proposals for the Coalhouse Fort open mosaic habitat management. This area is proposed to accommodate a number of species/species groups which may have differing management requirements. It may be helpful for the OLEMP to provide clarity on the management prescriptions that are proposed for each of the ecological features, acknowledging that the areas where the different species are likely to occupy will overlap.

12.20 For the Tilbury Link section of the scheme (Section 5.5 of the OLEMP), it will be important to ensure the various ecological aspirations do not inadvertently conflict with each other. For example, tree planting in close proximity to the ditches may result in shading limiting the aquatic species. Similarly, the proposed scrub planting will need to be carefully managed to prevent it becoming dominant.

Natural England notes that the Project proposes to replace the Tilbury Green Common land and reconnect the two parts of the existing common land (Section 5.5.9(h)). We are

continuing to provide advice on the Common Land to the Project Team and hope that this will be able to be reflected within the revised Environmental Statement.

12.21 Section 5.7 of the OLEMP provides information in relation to the proposed Green Bridges (Muckingford Road, Hoford Road and Green Lane). Natural England is broadly supportive of the green bridge provision. As mentioned previously, key to their success in avoiding severance of the landscape for wildlife and people will be their location, design and connectivity into the landscape and wider habitat networks either side of the route. We are keen to continue working with the Project Team to ensure that the green bridges are designed and managed in a way that truly reconnects the landscape for species and people and will be pleased to provide separate advice as the scheme progresses, both in general nature conservation terms and as part of our advice on the various protected species Letters of No Impediment.

12.22 In relation to Sections 6.2 Ockendon Link and 6.3 Orsett Fen Wetland Creation Natural England is continuing to provide advice to the Project on the Common Land along this part of the route. As these discussions progress, it will be important for the OLEMP to be updated to reflect the management objectives in relation to the Common Land.

In relation to the management prescriptions, we would generally recommend that the OLEMP included information on the proposed approach to fenland restoration and the water management regime to achieve the desired habitat(s). A partnership approach with local nature conservation stakeholders such as the Essex Wildlife Trust may be helpful to help work towards an appropriate outcome in this location.

12.23 In relation to the proposed green bridge at North Road (Section 6.5), please see our comments in relation to Section 5.7 of the OLEMP above.

12.24 Natural England has not reviewed in detail the habitat typologies provided in Section 7 of the OLEMP. We will be pleased to work with the Project Team on the measures that are proposed to mitigate and compensate for areas of nature conservation value as the scheme progresses.

12.25 We will also be pleased to work with the Project Team and the contractor at the detailed design stage to ensure that a robust monitoring programme and measures of success are incorporated into the LEMP. These measures of success should include monitoring of the habitat establishment along with the species groups which would be expected to utilise the habitats to ensure that they establish into functioning habitats of conservation value. The proposed Environmental Advisory Group would appear useful forum to support this work.

13 Outline materials handling plan

13.1 Natural England welcomes the confirmation that the Project is not seeking to create a new jetty (deep or shallow water) on the south side of the River Thames in order to reduce harm to the Ramsar site and its functionally linked habitat.

13.2 However, Natural England notes that proposals for importation of materials via existing river infrastructure facilities in Essex will be explored further. We would be pleased to work with the Project Team to more fully understand whether these proposals may result in impacts to designated sites or other species and habitats of conservation value..

13.3 Similarly, Natural England notes that options for use of conveyors to move material around within the order limits are still being explored (both north and south of the river). Again, we would be pleased to work with the Project Team to more fully understand whether these proposals may result in impacts to designated sites or other species and habitats of

conservation value.

14 Outline Traffic Management Plan for Construction

14.1 Natural England has previously expressed concern that the Lower Thames Crossing may lead to urbanising effects within the Kent Downs AONB resulting from the displacement of vehicles and 'rat running' during the construction and operation of the scheme. It would be helpful for potential urbanising effects to be reflected within the traffic management plan along with measures to mitigate any potential impacts to the AONB.

The information provided within the Ward summaries south of the river also suggests that a significant increase in traffic on rural lanes within the AONB is likely to result from the proposal, particularly in Cobham and the surrounding area, are likely to result from the proposal. Natural England therefore recommends that greater clarity is provided within the Environmental Statement on the impacts to the wider AONB and how these will be .

15 Wider Network Impacts Management and Monitoring Plan

15.1 Natural England notes that the 'Initial areas considered for intervention' within Table 2.1 identify a number of areas where interventions are likely to be required. Some of these are likely to have significant environmental implications for designated sites (from air quality for example) and also implications for the Kent Downs Area of Outstanding Natural Beauty arising from new signage resulting in urbanisation of the rural settlements and lanes and the construction/upgrade of existing roads and junctions along the strategic road network.

15.2 From the information provided, it appears that a number of these projects (for example the A229/M2 junction improvements within the Kent Down AONB) are anticipated to be delivered during the construction of the Lower Thames Crossing. Others such as the A2 Dover Access are anticipated to be delivered in the RIS 3 period from 2025-2030 which overlaps with the revised opening year for the Lower Thames Crossing of 2029.

15.3 If these upgrades are required as a consequence of the Lower Thames Crossing (and reasonably foreseeable) then it would seem appropriate for these to be considered as part of the cumulative assessment required within the Environmental Statement. Similarly, if impacts to the wider network of European sites are likely then they should be considered within the Habitats Regulations Assessment accompanying the Development Consent Order application.

16 Design Principles

16.1 Section 1.13 of the Design Principles document states that 'Clauses 4.28-4.35 of the NPSNN set out the criteria for 'good design' for national networks noting that design shall be an integral consideration from the outset'. It states: '4.29 Visual appearance should be a key factor in considering the design of new infrastructure, as well as functionality, fitness for purpose, sustainability and cost. Applying "good design" to national network projects should therefore produce **sustainable infrastructure sensitive to place** [our emphasis], efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible'.

Given the significant large adverse residual landscape and visual effects within the Kent Downs AONB, it is not clear how the scheme responds to the sensitive environment in which it sits south of the Thames. Natural England therefore recommends that much greater clarity is provided on how the scheme has considered the requirements of the NPSNN in fostering a high quality environmental design and outcome given the sensitive environment in which it sits.

16.2 Section 1.2.18 (Environmental Design) details that 'The Project has been developed to avoid or minimise significant effects on the environment, and during the design process further

measures have been incorporated into the Project to mitigate adverse impacts that would arise and that cannot be avoided.

Whilst Natural England recognises the measures that are being proposed to address environmental impacts, nevertheless, given the significant residual landscape effects at year 15 and the need for compensatory habitats provision for ecological, impacts, we recommend that much greater clarity is provided on how the project has maximised the opportunities to avoid and fully mitigate impacts to the rich environment through which it passes.

Natural England broadly supports the proposals for Chalk Park and Tilbury Fields (Section 1.2.18) and are keen to continue working with the Project Team to maximise the biodiversity value of these areas whilst recognising their multifunctionality and various objectives for the sites.

16.3 We note that a number of haul roads are proposed (Section 1.2.12), some of which may have implications for sensitive ecological receptors which we would recommend are fully considered within the revised Environmental Statement.

16.4 Regarding Section 1.3, the Scheme Objectives, as previously stated, Natural England is disappointed that the objectives do not include an aspiration to create an environmental legacy. The scheme's objectives appear focussed on delivering grey infrastructure rather than demonstrating how the project can be an exemplar of sustainable development.

16.5 Similarly, the overall design vision for the project (section 2.1) appears very centred on the highway and grey infrastructure rather than a holistic consideration of the environmental and socioeconomic benefits that a scheme of this nature can, and we believe should, be delivering as part of the Government's 25 Year Environment Plan aspirations and requirements.

16.6 This need for a clear emphasis on the environmental aspects of the project is underlined by the guidance provided in the National Policy Statement for National Networks (NPSNN). Section 5.152 of the NPSNN states there is a 'strong presumption against' road widening within protected landscapes, and, in section 5.153, that where consent is given in these areas, the Secretary of State 'should be satisfied that the applicant has ensured that the project will be carried out to high environmental standards and where possible includes measures to enhance other aspects of the environment.'

Throughout our engagement with the scheme, Natural England has been keen to work with National Highways to ensure that the Lower Thames Crossing is an exemplar of sustainable development and we would strongly encourage this to be a guiding principle for the Project.

16.7 We consider the 'Project wide design principles – Connecting People' (Section 2.1.3(a)) has an emphasis on the highway infrastructure rather than identifying the broader opportunity to leave a positive impact for communities to access and connect with the wider countryside and landscape. This could include the opportunity to reverse the severance from existing road infrastructure (particularly south of the Thames). Natural England would encourage a much greater emphasis on the legacy environmental opportunities for connecting people to be incorporated within the project and the design principles through high quality accessible natural greenspace provision connecting the public rights of way network, for example.

16.8 Natural England broadly welcomes the Design Principles for walker, cyclists and horse riders (Table 3.1, PEO.1-11) in providing enhanced opportunities for access to the local environment where this is compatible with the conservation of the habitats and species. Provision of high quality connecting routes and accessible natural greenspace should also be encouraged across the scheme where appropriate.

16.9 Natural England supports the PLA.01 design principle to reduce the number of highway structures along the route, particularly within the Kent Downs AONB. We would also support

the sensitive design of these structures through the selection of appropriate colour palettes and finishes, for example, to further reduce the visual intrusion of these.

16.10 Natural England supports the PRO.04 Biodiversity net gain design principle within Table 3.3 Project-wide design principles: Connecting processes and recommend that the Project's commitment to achieve 15%[3] net gain is included here.

16.11 The commitment to reconnecting habitats and reducing fragmentation detailed within the 'Project wide design principles – Connecting Places' is supported in principle and should aim to achieve connectivity both along and across the route. However given that the existing severance of habitats (particularly south of the Thames) will be further exacerbated by the Project, we consider the wording in Design Principle PLA.05 could be strengthened.

PLA0.5 (Table 3.2 Project-wide design principles: Connecting places) states (our emphasis) 'Design proposals shall prioritise improving connectivity between existing habitats wherever reasonably practicable, as defined within the Environmental Masterplan (REF TBC). Fragmentation of habitats shall be reduced as far as **reasonably practicable** by avoiding unnecessary barriers to movement and, **where necessary**, including design features which allow safe passage of animals, and colonisation by plants to enhance biodiversity'. Natural England recommends that a stronger commitment is made to ensure no further fragmentation of habitat and landscape results from the project is secured, along with a requirement to reduce existing severance impacts resulting from highway infrastructure.

16.12 In relation to the 'Project wide design principles – Structures' (Table 4.3), given the scale of the additional and new highway infrastructure associated with the project, the design guide and colour palette produced by the Kent Downs AONB Unit should be a key consideration when designing structures within the AONB to sympathetically incorporate them in to this nationally important landscape. A parameter and landscape design led approach should be considered as a key element for structures both within and in the setting of the AONB. Whilst no information on the detail of the design appears to have been provided within the consultation, Natural England considers that care needs to be taken with the 'sense of place' approach for the bridges within the AONB not to make them more conspicuous.

16.13 STR.08 states that green bridges 'are required mitigation for the severance and fragmentation of habitat'. However, as several of the green bridges do not provide linkage between habitats, we consider that as currently designed they do not achieve this purpose. For example, the Thong Lane south green bridge does not provide a link between habitats either side of the route as it stops at the limit of the widened A2. This means the severance caused by the local road and the High Speed 1 rail line remain as a barrier for people and wildlife. Natural England recommends that much greater clarity on how the green bridges will address habitat and landscape severance should be provided within the revised Environmental Statement and the Design Principles.

16.14 STR.09 clarifies that 'environmental, acoustic, boundary fences and security barriers shall be combined into a single structure as much as is reasonably practicable'. Given the potential for significant additional highway infrastructure to be installed within the Kent Downs AONB, Natural England recommends a firm commitment to ensure that such structures are integrated into a single feature, sympathetic to the landscape in which they sit would help moderate the significant landscape impacts from the project is provided.

16.15 STR.10 refers to the need to prevent urbanising effects from noise through the installation of noise and acoustic barriers. Given that a significant length of barriers is proposed within the Kent Downs AONB, the landscape character and visual impacts associated with these also need to be fully considered within the Design Principles given that they, themselves, will be

[3] [3] https://www.gov.uk/government/news/highways-england-seeks-partners-to-build-19-billion-lower-thames-crossing-roads

significant urbanising structures within the AONB.

16.16 Lighting, signage and technology LST.01 (within Table 3.5 Project-wide design principles: Lighting, signage and technology) details that 'Materiality and appearance shall be designed with consideration of the surrounding context of the landscape'. Natural England advises that this should be in accordance with the Kent Downs AONB Unit's 'Landscape Design Handbook' and 'The Selection and Use of Colour in Development' guidance document. For example, the permanent mobile barrier scheme on the M20 has confirmed that highway furniture will be painted in a colour sympathetic to its location within the AONB and the M2 Junction 5 flyover is to be clad in material in keeping with the Kent Downs. Natural England therefore recommends that much greater clarity is provided on how the street furniture will be designed and treated in a way to minimise the impacts to the Kent Downs AONB.

16.17 The LST.01-03 Lighting principles here are generally welcomed. It would however seem appropriate for details of sensitive landscape and ecological receptors to be included within the lighting principles to minimise light pollution and maintain dark corridors for wildlife.

16.18 The 'Project wide design principles – Landscape' contained within Table 3.6 Project-wide design principles: Landscape details that a small number of non-native species will be planted, where appropriate, to help future proof the habitats against climate change. Natural England would recommend that the scheme uses native species of local provenance for all habitat creation and we have provided more detail on this in relation to the planting palette below.

16.19 Natural England has not provided detailed comments on the design principles for the specific habitats to be created as part of the project at present. We support the broad habitats to be created and will be pleased to provide more detailed advice on the principles and management proposals as part of our advice on the revised Environmental Statement and mitigation strategy.

16.20 LSP.06 details that 'where large scale landscape mitigation is required, the design of this shall be developed to maximise the Project's legacy for local communities, landowners, whilst considering existing land use. Where compatible with mitigation proposals the Project shall provide, within the Order Limits, enhanced access, amenities and green infrastructure. Where there is alignment between the Project and other existing or planned green infrastructure schemes identified by local authorities and other relevant stakeholders, the Project's detailed design will be developed to integrate with the delivery of green infrastructure by others'. This suggests that a much more visionary, enhanced green bridges led approach to reconnecting the landscape within the Kent Downs severed by the widened transport infrastructure could be delivered, and that this would both complement and be entirely compatible with the design principle. Natural England therefore recommends that much greater emphasis on mitigating the landscape severance for people and wildlife is considered as part of the Environmental Statement and the Design Principles.

16.21 Table 3.6 also makes reference to the need to respect historic landscapes (LSP.07) and ecological habitats. However, no such reference appears to be made to ensure that the nationally important landscape of the Kent Downs AONB is given a similar level of consideration within the Design Principles. Natural England recommends that reference to the Kent Downs AONB be included within one or more of the landscape design principles.

16.22 The 'Section specific principles: Section 1 – A2/M2 Corridor' refers to retaining woodland where 'reasonably practicable' and where loss is unavoidable that woodland will be replaced. Given there are areas of ancient and semi natural woodland and also woodland within the Shorne and Ashenbank Woods SSSI that will be directly lost, we would recommend that the wording within the Design Principles is strengthened.

16.23 S1.04 Lane Over A2 Overbridges details that (our emphasis) 'To provide connectivity of habitats for species including dormice, badgers, reptiles, bats and Great crested newts

between Shorne Woods and Ashenbank Woods, Jeskyns and Cobham Park, and to strengthen the woodland character, new green bridges shall be provided for the replacement of Thong Lane (Old) and Brewers Road crossings. Landscape shall be designed to **provide continuity of habitat between the bridges along the main highway's corridor as far as practicable'**.

As mentioned previously, the scheme design shared as part of the Community Consultation suggests that the green bridges will not provide habitat connectivity across the A2 and High Speed 1 corridor. The Thong Lane south crossing does not provide habitat connectivity as it terminates before the local road which runs parallel to the A2 and does not provide connectivity for arboreal species to cross the High Speed 1 rail line. Similarly, the habitat to the south of the Brewers Road Bridge links into the historic Cobham Park with scattered parkland trees rather than woodland or hedgerows. As such we would recommend that a stronger emphasis of truly landscape scale habitat connectivity for people and wildlife is a central component of the green bridges along the A2/M2 corridor. Natural England remains keen to work with National Highways and the Lower Thames Crossing Project to ensure that such opportunities are fully realised.

16.24 The permanent realignment of NCR177 (S1.05) and the surfacing to the south of the A2 may have implications for the habitats and area of the Kent Downs AONB through which it passes – if this is the case these will need to be fully assessed within the Environmental statement.

16.25 S1.06 The 'Reflect the surrounding landscape character' design principle provides details of the woodland shaws that the landscape strategy aims to reinforce. Natural England recommends that the proposals should reflect closely the landscape character assessment for the Kent Downs AONB and local assessments, given that historic parklands are also a key component of the landscape in this area.

16.26 The new woodland areas to the east of Shorne Woods Country Park will be 'developed through collaboration and engagement with Shorne Woods Country Park and relevant local stakeholders, subject to their requirements being compatible with mitigation requirements as defined in the Environmental Masterplan'(S1.08). Given these areas fall within the Kent Downs AONB, the design will need to ensure that they conserve and enhance the AONB. Since the woodland planting is also designed to offset the loss of SSSI woodland, Natural England will need to be engaged with the design of the woodland areas to ensure they are compatible with the SSSI conservation objectives.

16.27 Within S1.09 Park Pale Acoustic Screening Natural England welcomes the commitment that the design of the screening will be refined in conjunction with the Kent Downs AONB Unit but we would also request that Natural England is party to these discussions given our national statutory adviser role for protected landscapes and the potential implications for the Shorne and Ashenbank Wodds SSSI that may result.

16.28 A2/M2/Lower Thames Crossing Junction S2.01, S2.04 and S2.06 provide details of the proposed woodland connectivity between Claylane Wood to the east of Gravesend and Shorne Woods via the Thong Lane green bridge. As with the two green bridges across the A2, the habitat connectivity either side of the Thong Lane bridge appears limited in extent with scattered trees across the bridge itself and to the east which do not link into the wider wooded landscape. We would recommend that greater clarity on how habitat connectivity will be achieved is provided.

16.29 S2.10 Retaining walls and materials details that 'To integrate the retaining structures at the junction within the AONB, into the wider landscape, either green walls/earth banks or use of materials or cladding, reflective of the local vernacular (such as flint or ragstone) shall be used'. This principle is welcomed but we would recommend that a similar commitment is included within the design principles for the A2/M2 section given that these works also fall

within the Kent Downs AONB.

16.30 The replacement woodland to the north of Brummelhill Wood (S3.15 Gravesend link and south portal) details that 'to replace existing ancient woodland lost, a new area of woodland (Planting Appendix LE2.11 – Woodland with non-native species) shall be planted north-east of Thong on the upper slopes adjacent to the AONB boundary/Brummelhill Wood'. If this woodland provision is to offset the impacts of the scheme upon ancient woodland, then the habitat should aim to replicate the species vegetation type that is lost using appropriate native species rather than non-native species.

The proposed non-native species also include *Acer negundo*, a potentially invasive species. Natural England welcomes the use of native species of local provenance, but we do not support the use of non-native species in the planting mix, given the high biodiversity interest of the woodlands in this area. The National Vegetation Classification habitat type for the habitats impacted would be a useful guide as to the species that should be planted within the mitigation and compensation habitats.

16.31 Design Principle S9.01 (approach to marshland habitat) within Table 4.5 Section specific principles: Section 7, 8 & 9 – Tilbury Marshes and North Portal could be strengthened to make reference to the opportunities the Lower Thames Crossing Project offers to restore the degraded landscape where it is possible to do so.

16.32 In Design Principle S9.02, Natural England would encourage the inclusion of a reference to the important biodiversity contribution the Tilbury Fields area can provide as a key connecting component in the landscape, particularly for invertebrates. We are keen to continue working with the Project Team to help realise the multifunctionality of the site for biodiversity, landscape and sympathetically-managed access (given the sensitivity of the riverside habitats).

16.33 In relation to Principle S09.05 Two Forts Way, Natural England recommends that the Project considers and takes into account the requirements of, the England Coast Path in this area as appropriate.

16.34 Natural England understands that the area at Coalhouse Fort is no longer to be used for water vole mitigation and instead will be used to provide replacement habitat for non-breeding birds associated with the coastal designated sites. It would therefore appear appropriate for Design Principle S9.13 Water vole habitat to be updated to reflect these changes.

16.35 For Design Principle S12.03 Mardyke and Orsett Fen Viaduct Design it may be appropriate for the design principle to make reference to minimising shading to maximise the benefit of the habitat creation works in this area. We welcome the commitment that the viaducts will not be lit, so as to improve the prospects of wildlife movement beneath.

16.36 Natural England welcomes the aspiration within Principle S12.06. Wetland Habitat Creation (Table 4.7 Section specific principles: Section 11 – A13 Junction) and we look forward to working with the project team to ensure this principle is successfully implemented. The text could be strengthened by specific reference to Orsett Fen.

16.37 As mentioned previously in this letter, Natural England recommends that a strong commitment to monitoring all of the mitigation land is included and it would seem appropriate for this to be reflected within the Design Principles. A robust monitoring strategy to ensure that functioning habitat is established should be included which should ensure that the habitat reaches its target ecological condition and also supports the breadth of species that would be expected.

16.38 Natural England has significant concerns regarding the planting palette proposed for some

of the habitat types, particularly the woodland palette.

Natural England advocates the use of native species local provenance for all of the woodland creation areas to maximise the biodiversity benefit from them and these should reflect the species and habitat types that are to be directly impacted. The design palette includes a number of non-native species which we consider are not appropriate for the habitat to be created for the loss of ancient and seminatural woodland to the scheme. We consider that the woodland planting should try to replicate the species composition and habitat structure as closely as possible to that which is lost (whilst acknowledging of course that it is not possible to recreate ancient woodland).

Natural England advises that woodlands created to offset losses to ancient woodland should be adhering to the same principles as managing the ancient woodland assets.

16.39 Natural England will be pleased to provide more detailed guidance on the planting palette and species mixes to maximise the biodiversity value for all of the mitigation and compensation habitats as the scheme progresses to maximise their biodiversity and value and their important role in conserving and enhancing the the Kent Downs AONB.

17 Schedule 2 Requirements and Explanatory Memorandum

17.1 Section 1.2.8 details that (our emphasis) 'Requirement 3 allows for a **proportionate and reasonable level of flexibility in the final design of the Project**, something that is considered necessary and appropriate in delivering complex major infrastructure projects such as this. Importantly, that flexibility is limited to the scope of the assessment of effects in the Environmental Statement submitted with the application'. Whilst Natural England acknowledges that flexibility is important, we consider that caution will be required to ensure that the flexibility does not result in greater environmental impacts to those considered through the DCO process. It would be helpful if Requirement 3 were amended to reflect this, perhaps along the following lines '…flexibility is limited to the scope of the assessment of effects and the necessary mitigation measures that have been identified in the Environmental Statement submitted with the application'.

17.2 Section 1.2.9 (Requirement 4: Construction and handover environmental management plans) details that:

'Requirement 4(1) requires that pre-commencement activities (being activities such as environmental surveys and monitoring) referenced above must be carried out in accordance with a pre-commencement environmental management plan including the measures in the pre-commencement REAC. This will ensure that these pre-commencement activities are carried out in accordance with applicable mitigation measures, even though they will be carried out before the detailed plans and schemes are approved under Schedule 2'.

It is not clear (with cross reference to Section 3 of the Code of Construction Practice) how these measures will be agreed if they are in advance of the detailed plans and schemes being approved under Schedule 2; it would be helpful if further clarity could be provided in this respect. Some of these may have implications for designated sites (eg ground monitoring and archaeological works if they are to take place within them). It is understood that the Pre-commencement EMP will be approved by the relevant Local Planning Authority so it is unclear if there is a requirement for Natural England to be consulted.

17.3 It would be helpful for clarity to be provided on the work numbers for the 'excluded utility works' which can be undertaken in advance of the formal commencement of the development. The Schedule 2 Part 1 requirements has a gap for the work numbers to be inserted; given some of the utility works are within designated sites and protected landscapes and the detailed avoidance and mitigation strategy will come post consent it would be helpful to know which works this applies to and how the avoidance and mitigation

measures will be controlled.

17.4 Detailed design 3.—(1) states :

'The authorised development must be designed in detail and carried out in accordance with the design principles document and the preliminary scheme design shown on the engineering drawings and sections, and the general arrangement drawings, unless otherwise agreed in writing by the Secretary of State following consultation by the undertaker with the relevant planning authority on matters related to its functions, provided that the Secretary of State is satisfied that any amendments to those documents showing departures from the preliminary scheme design would not give rise to any materially new or materially different environmental effects in comparison with those reported in the environmental statement.'

Given the significant direct and indirect impacts to designated sites, protected landscapes, protected species and wider habitats and species of conservation concern Natural England would expect to be consulted on any design amendments which may result in different environmental impacts to those detailed within the Environmental Statement submitted as part of the Development Consent Order.

17.5 It is noted that '(6) The EMP (Third Iteration) must address the matters set out in the EMP (Second Iteration) that are relevant to the operation and maintenance of the authorised development and must, except where contained in a LEMP approved under paragraph 5 of this Schedule, contain— (a) the environmental information needed for the future maintenance and operation of the authorised development; (b) the commitments to aftercare, monitoring and maintenance activities relating to the environmental features and mitigation measures that will be required to ensure the continued long-term effectiveness of the environmental mitigation measures and the prevention of unexpected environmental impacts during the operation of the authorised development; and (c) a record of the consents, commitments and permissions resulting from liaison with statutory bodies.

Whilst this is welcomed, we would advise that there also needs to be a feedback mechanism for remedial actions should the monitoring show that the mitigation measures have not reached their ecological target condition. It would therefore seem appropriate for an additional requirement to be inserted along the following lines:

''b) the commitments to aftercare, monitoring, *remedial habitat management measures* and long-term maintenance activities relating to the environmental features and mitigation measures that will be required to ensure the continued long-term effectiveness of the environmental mitigation measures and the prevention of unexpected environmental impacts during the operation of the authorised development;'

17.6 The Landscaping and Ecology section details that '5.—(1) Each part of the authorised development must be landscaped in accordance with a LEMP which sets out details of all proposed hard and soft landscaping works for that part and which has been submitted to and approved in writing by the Secretary of State, following consultation by the undertaker with— (a) the relevant planning authority; and4 (b) Natural England in respect of a LEMP which is proposed to include any land in the Shorne and Ashenbank Woods Site of Special Scientific Interest and/or the South Thames Estuary and Marshes Site of Special Scientific Interest'.

Given the loss of habitat from within the Shorne and Ashenbank Woods SSSI and loss of functionally linked land from the Thames Estuary and Marshes Special Protection Area and Ramsar site, Natural England would expect to also be consulted on the LEMP for habitat creation required to offset the loss of habitat from these sites, not just for land covered by the LEMP within the designated sites.

17.7 In addition, given the significant impacts to the landscape character and visual receptors within the Kent Downs AONB, Natural England would expect to be consulted on the LEMP

regarding measures to moderate the impacts to the nationally important landscape.

17.8 In relation to the surface and foul water drainage (Sections 8(1) and (2)), Natural England would expect to be consulted in relation to the surface water drainage strategy for the construction compound which is to discharge via the ditch network within the South Thames Estuary and Marshes SSSI and the Thames Estuary and Marshes Ramsar Site.

17.9 Regarding the archaeological works (Sections 9(1) to (7)) it is not clear whether any of these are to be undertaken within Sites of Special Scientific Interest. If this is the case, then detail of the methodology and working area should be included within the Terrestrial Biodiversity chapter of the environmental statement along with any mitigation measures proposed. Natural England would expect to be consulted on any archaeological investigations within statutory designated sites.

18 Code of Construction Practice First Iteration of Environmental Management Plan

18.1 Whilst it is acknowledged that the current consultation is limited to the documents that have been shared, it is noted that Section 2.1.1 (Procedures for the approval of EMP2 (Environmental Management Plan)) states 'no part of the authorised development (the Project) is to commence until an EMP2 in accordance with this CoCP has been submitted to and approved in writing by the SoS following consultation … There is an exception to this for certain specified pre-commencement activities, as set out in article 2 of the DCO'.

The activities contained within article 2 of the DCO do not appear to have been included within the current consultation documents. As such, it is not possible for Natural England to provide advice on whether the excepted activities may have significant implications for areas within our statutory function.

18.2 Natural England welcomes the confirmation within Section 2.3.1 that Natural England will be one of the stakeholders that the contractor will engage with post consent. We will be pleased to continue working collaboratively with the contractor, National Highways and other stakeholders should consent be granted.

18.3 Similarly, we welcome the commitments within Section 2.3.2 which details that 'The EMP2s, developed by the Contractors will set out their procedures for monitoring compliance with the mitigation measures set out in this document and the REAC'. During discussions with the Lower Thames Crossing project team, we have suggested that an Environmental Advisory Group (or equivalent) would be a useful forum to continue the constructive, partnership working post consent. Such a group may be a helpful mechanism for the contractor to work collaboratively with stakeholders on such compliance measures.

18.4 Section 2.6.6 details that 'Highways England or their representatives will carry out site inspections and audits to verify the Contractors' compliance with EMP2. On request, relevant planning authorities, the Environment Agency and Natural England, will be given access to the results of the site inspections and audits, along with the opportunity to attend and observe Highways England site inspections and audits'. In the spirit of open collaborative working, it would seem appropriate for these reports to be shared with relevant stakeholders as a matter of routine, perhaps as part of an Environmental Advisory Group.

18.5 Table 3.1 'Pre-commencement activities and locations' lists species translocations and archaeological investigations amongst the works that can be undertaken pre-commencement. Some of these may have implications for the natural environment within Natural England's remit particularly if any of the investigations are to be undertaken within, or may indirectly impact, a statutory designated site. It would therefore be helpful if clarity were provided on how stakeholders will be consulted on the pre-commencement EMP to ensure that these activities in advance of the EMP2 being agreed do not result in significant

impacts.

18.6 Table 4.2 'Consents and permits that may be required' does not list the requirement for SSSI assent should activities not be fully covered by the DCO. Natural England is committed to working collaboratively with the Project, and whilst it is hoped that sufficient detail and certainty will be provided within the resubmitted DCO on the nature and scale of works to be undertaken within (or affecting) the SSSIs along the route, at present Natural England does not consider sufficient detail has been provided.

18.7 The Construction Site Layout and Housekeeping (Section 6.6) details within Section 6.5.2 that 'In addition to the measures in the REAC, the following principles will be implemented subject to local constraints:…

> b. Noise-generating activities will be sited away from noise-sensitive receptors where practicable and screened if necessary and practicable to reduce the noise impact.

Given the location of some of the construction areas and compounds close to designated sites, if it is not 'practicable' to site noise generating activities away from sensitive receptors, Natural England would expect additional mitigation measures to be implemented to ameliorate the impacts from noise disturbance.

18.8 Sections 6.1.08-9 detail the proposed actions for extreme weather events. In addition, Natural England would recommend that the Project also follows the approach where disturbing works to birds are stopped during prolonged period of cold weather in a similar vein to the cessation of wildfowling. As an additional source, it would appear appropriate to include reference to the Joint Nature Conservation Committee's severe weather scheme and its publication of restraint or suspension of activities[4].

18.9 Table 7.1 'Pre-Commencement REAC table' details a number of actions that will be undertaken 'where reasonably practicable'. It would be helpful if further detail on what further measures would be implemented should they not be practicable to ensure that impacts are avoided are provided. A high degree of certainty that the actions can be delivered should be provided within the DCO and accompanying control documents.

18.10 Natural England notes that there are no specific pre-commencement actions in relation to the impacts to the Kent Downs AONB within Table 7.1; it would be helpful if clarity were provided on any measures that are to be implemented at the pre-commencement stage.

18.11 Table 7.1 also refers to the securing mechanism within the DCO as being EMP2 Requirement 4 for the terrestrial biodiversity pre-commencement requirements. As the DCO has not been shared as part of this consultation, we are not able to provide advice on whether Requirement 4 provides sufficient certainty at this stage and we will be pleased to provide further advice once it is possible to share the DCO.

18.12 In addition, for the non-licensable terrestrial biodiversity requirements, Table 7.1 details that the 'achievement criteria' will be 'implementation of commitment actions'. Given the complexity of some of these ecological translocations, achievement criteria on ecological outcomes or ecological functionality may be more appropriate. It may be helpful for the REAC to include detailed ecological indicators of success based upon the habitat establishment and target ecological condition along with the species that the habitat should support comparing this to sites in the locality. Such a good practice approach was adopted by National Highways on the A21 Pembury to Tonbridge Dualling scheme and is an approach we would advocate for this project.

18.13 REAC reference TN017 (Translocation of notable species) refers to the translocation of non-licensable reptiles and amphibians. Other, non-licensable, notable species of conservation

[4] Available to download from https://jncc.gov.uk/our-work/severe-weather-scheme/

concern have been recorded along the route corridor so it would be helpful for clarity to be provided on how the project will mitigate the impacts to these.

18.14 As with the pre-commencement REAC Table 7.1, Table 7.2 REAC table refers to the securing mechanism within the DCO as being EMP2 Requirement 4 for the terrestrial biodiversity pre-commencement requirements. As the DCO has not been shared as part of this consultation, we are not able to provide advice on whether Requirement 4 provides sufficient certainty at this stage and we will be pleased to provide further advice once it is possible to share the DCO.

18.15 As with Table 7.1, the 'achievement criteria' for air quality, geology and soils, the Habitats Regulations assessment, landscape and biodiversity within Table 7.2, in the main, are the 'implementation of the commitment'. Given the nature and scale of the works and the mitigation measures required, it would seem appropriate for more detailed and measurable achievement criteria with robust indicators of success to be included for all of the commitments. This would help ensure that the scheme does not result in a deterioration of the rich environment through which it passes, a key requirement of the NPSNN.

18.16 The East Tilbury Haul Road (GS020) has the potential to impact areas of ecological value for invertebrates and other species and recommend that measures are implemented to avoid or fully mitigate any such impacts.

18.17 HRA001 (Seasonal constraints to construction of discharge from construction of South Portal), HRA002 (Seasonal constraints to works at the northern outfall) HRA005 (Protection of birds from activities at the Northern tunnel entrance compound) and HRA006 (Seasonal constraints to works to form noise barriers at compounds) detail that works would be undertaken during the spring and summer to avoid impacts to non-breeding birds associated with the Special Protection Area and Ramsar Site. Natural England has previously advised that works within, and in close proximity to the South Thames Estuary and Marshes Site of Special Scientific Interest during these months could impact breeding birds. In addition, we would advise that the passage bird season includes July and August. We therefore recommend that greater clarity should be provided on how impacts to the breeding and wintering birds associated with the designated sites are being addressed. We are continuing to work with the Project Team on these topics and it would appear appropriate for the REAC Commitment to be updated to reflect the recent discussions.

18.18 In relation to HRA007 (Habitat enhancement in functionally linked land) and HRA008 (Groundwater surveillance), Natural England is still discussing these matters with the Project Team and hope to be able to resolve any outstanding concerns in the near future. During these discussions, the Project Team has confirmed that additional habitat will be created north of the Thames at Coalhouse Fort to mitigate the loss of functionally linked land so we would recommend that HRA007 is updated to reflect the current proposals.

18.19 Natural England welcomes the commitment to undertake surveys of bird activity (HRA009, Bird behaviour surveillance) but would recommend that this also covers the bird on passage period in addition to the overwintering season.

18.20 Natural England welcomes that the agreement, following our discussions with the Project Team, for the surface water drainage from the southern construction compound to meet agreed chemical water quality parameters prior to its discharge in the South Thames Estuary and Marshes SSSI and the Thames Estuary and Marshes Ramsar site is not included within the HRA section of Table 7.2 but note that it is included with RDWE033 (Discharge from construction of South Portal). We would therefore recommend that all of the agreed actions following our discussions on the Habitat Regulations Assessment are reflected within Table 7.2 when it is revised.

18.21 As part of our ongoing collaborative work with the Project Team, Natural England is providing advice on air quality impacts to designated sites. We note that at present, no HRA

commitment is included in relation to the measures that will be implemented to mitigate the impacts of traffic and construction generated air quality and would recommend that these are included.

18.22 Natural England notes that the mitigation measures for impacts to the landscape character, visual receptors, tranquillity and urbanising effects to the wider Kent Downs Area of Outstanding Natural Beauty are not detailed within Table 7.2 (either within the Landscape topic or other relevant topic specific sections such as noise and vibration). We would therefore recommend that Table 7.2 includes the full details of the measures that are to be implemented to moderate the impacts to the nationally protected landscape.

18.23 In relation to the achievement criteria for LV003 (Landscape maintenance), we note that the achievement criteria are 'Successful establishment of planting within five years to serve its mitigation purpose as identified on the Environmental Masterplan'. The establishment periods for the several of the habitats that are to be created to compensate for impacts detailed within the Design Principles exceed the five year period so they may not have reached their mitigation purpose within this timeframe. As such, it may be appropriate for the achievement criteria to cross refer to the Design Principles.

18.24 It would be appreciated if clarity were provided on RDWE040 (Maintaining floodplain flow connectivity) as it would be useful to understand whether or not this may affect the wetland habitat creation at Orsett Fen.

18.25 For the Terrestrial Biodiversity TB007 (Habitat management) we note that 'Retained and new habitats would be managed having regard for Natural England's The Mosaic Approach: Managing Habitats for Species (2013) to improve both priority habitats and species'. This approach may be appropriate for the areas of open mosaic habitat that are to be created but other habitats such as the woodland to compensate for the loss of ancient and semi-natural woodland (including that from within designated sites) will require specific management to ensure they reach the desired ecological condition. It would appear appropriate for habitat specific habitat management measures, supported by ecologically robust indicators of success and target habitat condition, to be detailed within the document.

18.26 As with the pre-commencement works, TB017 (Translocation of notable species) only refers to the translocation of non-licensable reptiles and amphibians. Other notable species have been recorded along the scheme route and it would seem appropriate that details of how the Project aims to conserve and enhance these are included.

18.27 Natural England's advice is that ancient woodland and impacts to the Shorne and Ashenbank Woods SSSI should be avoided, in accordance with the NPSNN and the NPPF but we acknowledge that the Secretary of State may consider there are exceptional circumstances that justify the loss of these irreplaceable habitats. Should consent be obtained, we recommend that good practice from other schemes, including those from the A2 widening and the A21 Pembury to Tonbridge Dualling are fully reflected within TB028 (ancient woodland soil translocation). Natural England would also expect a stronger commitment within the 'achievement criteria' to be provided. As mentioned previously, a clear commitment to ensure that the target habitat is delivered in terms of both the habitat composition and the species it supports should be provided in line with good practice from other schemes. Natural England would be pleased to discuss this further with the Project Team and consider that an Environmental Advisory Group approach would be beneficial in shaping this should consent be granted.

18.28 For all of the proposed compensatory habitats that are to be created, key to their success will be the appropriateness of the site in terms of the soil conditions, aspect and nutrient status, for example. It would seem appropriate for such information to be provided within the revised Environmental Statement.

Annex C.5 Natural England Local Refinement Consultation Response

Date: 20 June 2022
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Lower Thames Crossing
Local Refinement Consultation
National Highways

By email only to [redacted]

Dear Sirs

Lower Thames Crossing – Local Refinement Consultation 2022

Thank you for the email of the 12 May 2022 seeking Natural England's advice on the Local Refinement Consultation for the Lower Thames Crossing project.

As highlighted in our response to the Community Impacts Consultation in July 2021, Natural England welcomes the collaborative approach that has been taken by the project team. The constructive dialogue has allowed us to continue to address and resolve areas of concern, as well as identify opportunities to enhance the natural environment. The advice in this response is again provided in the spirit of collaborative working to help National Highways achieve an exemplar, sustainable development, which delivers a significant lasting legacy for people and wildlife.

We have provided our comments below in response to the information provided in the consultation.

Chapter 2 Local refinement consultation
Natural England welcomes the proposed use of low-noise road surfacing along sensitive sections of the route, including the Kent Downs Area of Outstanding Natural Beauty (AONB) (page 11). Such a commitment will help reduce the noise resulting from the scheme to receptors within the AONB, and is supported. Key to the success of this mitigation measure will be ensuring the low-noise surfacing is retained in these areas as an integral part of the road design.

Chapter 3 You said, we did
Natural England welcomes the extension of open space provision at Chalk Park for the landscape, access and biodiversity benefits that this proposal will bring.

Chapter 4 Proposed changes since the community impacts consultation

<u>An area north of Shorne Ifield Road and a field south of Shorne Ifield Road (Map Ref. 1)</u>
In the context that compensatory woodland creation will be needed if the scheme is approved, we welcome the proposed amendment (page 32) to enhance woodland connectivity by moving the block of woodland planting to the south of the Shorne Ifield Road, so that it will abut the Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI). It will be important to ensure in the design of this area of habitat that the far-reaching views from the Kent Downs AONB towards the Thames Estuary are maintained.

As stated in our response to Chapter five of the consultation (below), we also support the use of natural regeneration as an important means of establishing new native woodland adapted to local environmental conditions.

Land at the Southern Valley Golf Club (Map Ref. 5)
The additional area of public access land at the Southern Valley Golf Club (page 40) is welcomed for the biodiversity benefits it will bring (from the creation of a mosaic of species-rich chalk grassland and woodland), and the opportunities for people to recreate within these semi-natural habitats. It will also be beneficial in securing accessible natural greenspace to the eastern edge of Gravesend, providing views to the Kent Downs AONB.

Redesign of Tilbury Fields (Map Ref. 7)
Natural England notes the proposed redesign of the Tilbury Fields in the vicinity of the northern portal. We are continuing to advise the LTC project team on the design of this area, and welcome the positive and constructive discussions that are focused on securing a strong package of environmental mitigation measures.

We understand that the overall area of proposed open mosaic habitat is expected to increase, compared with the previous design, although the change understandably involves less riverside frontage and a more north-south orientation. There are significant opportunities in the Thames Estuary to help secure nature recovery, and the proposed Tilbury Fields affords the opportunity to create (and manage in perpetuity) a large area of wildlife-rich habitat which will enhance landscape-scale connectivity in the area, consistent with those ambitions.

It will also be important that the scheme secures and maximises the opportunities presented by beneficial re-use of materials (including PFA and other ecologically important substrates) and that the detailed design stage can progress the intent for this area. At figure 4-49 we note proposed new access in this area, and it will be important for the scheme to carefully balance access to, and enjoyment of, the area with the needs of wildlife in order for this area to achieve its objectives, including the river frontage area.

Northern Portal Access Road (Map Ref. 8)
Natural England notes the redesign of the western side of the north portal access road, and its stated intent to '*potentially accommodate further development in the future*' and '*with possible future development in mind*'. General Arrangement Sheet 17 does not appear to allocate a proposed land use for the area arising as a result of this change between the route alignment and the western access road. It would be helpful for clarification to be provided regarding the proposals for this area.

Land at former Tilbury Power Station (Map Ref. 9)
Natural England notes the order limits amendment to include land at the former Tilbury Power Station for construction-related activity. This land is known to support some important wildlife habitats and we will be happy to continue to advise on the ecological baseline and environmental assessments needed to inform the activities in this area.

New Footpaths around Coalhouse Fort / Bowaters (Map Ref. 12)
Natural England notes the proposed new footpaths in the general area of Coalhouse Fort. Whilst we welcome new opportunities for public access where appropriate, we note the routes proposed, in particular in the area of Bowaters, contain important habitats for breeding birds which are likely to be sensitive to disturbance from increased access. We will be pleased to continue to work with the project team to help ensure that a balance is achieved between proposed new access and the existing wildlife interest.

Chapter 5 Assessment of the impacts of nitrogen deposition and proposals for mitigation and compensation
Appendix 1 – Nitrogen deposition impact assessment, mitigation and compensation for the Lower Thames Crossing

Natural England welcomes the detailed and ongoing assessment of the effects of nitrogen deposition on sites designated for their wildlife importance. We are pleased that the assessment, following advice from Natural England, has been revised to include the consideration of ammonia to inform the understanding of the impacts on the affected sites. We are working closely with National Highways and the LTC project team to ensure that appropriate measures are secured in response to these impacts, and we recognise the considerable work that has been undertaken to identify and assess the proposals being put forward.

It is important that the measures are identified in the context of the avoid/mitigate/compensate hierarchy, and we note that these principles, as well as the precautionary principle, have been used to underpin the assessment. In this context, we support the identification and use of mitigation measures as an important step before the consideration of compensatory measures. We note that the speed enforcement measure being considered for the M2 has the potential to reduce the area of compensation being proposed in Kent, and we would support the use of this measure if it is achievable.

With regard to Epping Forest Special Area of Conservation (SAC), we note that the identified speed limit mitigation would have the effect of reducing nitrogen deposition, and Natural England supports the use of this measure as the means by which air quality impacts to the site arising from the scheme can be managed. We are also continuing to provide advice on the potential impacts on the North Downs Woodlands SAC in Kent.

Our advice on compensation for nationally and locally designated sites and areas of ancient woodland is provided in the context that, should the scheme be approved, the compensation areas will be a necessary part of the package of measures needed to address the impacts from nitrogen deposition. Whilst we recognise the proposals are still being finalised, we support the approach being taken, and we welcome National Highways' ongoing commitment to engaging with stakeholders and landowners.

Natural England has helped advise on the habitat site selection methodology, and we support the landscape-scale approach that has been taken to identifying the proposed compensation areas, with its aim of enhancing the resilience of the affected sites by strengthening the ecological connectivity between them. This outcome is also supported by the proposed provision of large compensation areas in close proximity to the designated sites, an approach in keeping with the 'more, bigger, better and joined' principles set out in the 'Making Space for Nature' review led by Professor Sir John Lawton[1].

Whilst the site selection methodology has excluded existing wildlife-rich habitats (such as designated sites), the proposed areas may still support important wildlife interest. The ongoing consideration of these sites should therefore include an assessment of their baseline ecological interest, with targeted surveys (as may be needed) to ensure there is an up-to-date evidence base. It is also important that these areas are considered in terms of their potential effects on other environmental features, including landscape, cultural heritage, and soils, and we will continue to advise as appropriate on these matters as part of our advice on the Environmental Statement.

[1] https://webarchive.nationalarchives.gov.uk/ukgwa/20130402151656/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf

In addition, some of the parcels of land are subject to existing agri-environment or other land-based schemes, and it will be important to consider the implications of the proposed nitrogen deposition compensation areas in this context. Details of the land covered by these schemes can be found under the 'Land Based Schemes' section of https://magic.defra.gov.uk/.

Whilst there is a particular focus on woodland creation, given the context of the sites that are affected, we also support the proposed creation of a mosaic of wildlife-rich habitats. We have advocated the use of natural regeneration as an important means of establishing new native woodland adapted to local environmental conditions, and we welcome the inclusion of this technique in the objectives for the proposed compensation areas. We also recognise the wider benefits these areas can provide, including, where appropriate, the provision of publicly accessible sites which will help make a positive, long-term contribution to the environmental legacy of the project.

Natural England welcomes the positive and constructive approach that has been taken to respond to the environmental impacts of the Lower Thames Crossing scheme, and we will continue to work with National Highways and the project team as the proposals are further refined.

Yours faithfully

[redacted]

[redacted]
Natural England
Sussex and Kent team

Annex C.6 Legal note on the disapplication of SS.28E and 28H of the WCA 1991

Appendix A Legal note on the disapplication of SS.28E and 28H of the WCA 1991

A.1 Executive summary

A.1.1.1 This joint advice note has been prepared by Burges Salmon LLP and agreed with BDB Pitmans LLP on behalf of National Highways Limited ("**National Highways**").

A.1.1.2 Sections 28E and 28H of the Wildlife and Countryside Act 1981 (the **"Act"**) provide two alternative consenting mechanisms for operations likely to damage a site of special scientific interest (a "**SSSI**"). Broadly, s.28E relates to owners and occupiers of land, and s.28H to a variety of public bodies.

A.1.1.3 This note sets out the relevant statutory provisions, how they would apply to nationally significant infrastructure projects ("**NSIPs**"), and our recommendation as to how SSSI consents are addressed within National Highways development consent orders ("**DCO**"). Our recommendation is that both ss. 28E and 28H of the Act should be disapplied in National Highways' DCOs, in the interests of certainty and the expeditious delivery of NSIPs. Importantly, the consenting process for DCOs ensures that the protection for SSSIs provided by sections 28E and 28H of the Act, and Natural England's ("**NE**") functions under those provisions, are preserved.

A.1.1.4 This note has been prepared to inform discussions with NE, as the regulatory body in respect of SSSIs in England and Wales, with the aim of agreeing general principles for any given project at an organisational level.

A.2 Section 28E consent

A.2.1.1 Section 28E provides that the owner or occupier of any land included in a SSSI shall not carry out, or cause or permit to be carried out, on that land any operation likely to damage the SSSI, without the consent of NE[1].

A.2.1.2 Under s. 28E(2), the duty to notify (and obtain consent from) NE of operations in an SSSI under s.28E(1) does not apply to an owner or occupier being an authority to which s.28G applies (a **"Section 28G Authority")**.

A.3 Section 28G authorities and the general duty

A.3.1.1 Under subsection 28G(3)(f) a "public body of any description" will be a Section 28G authority.

A.3.1.2 National Highways is a government-owned, arm's-length company, created pursuant to the Infrastructure Act 2015. The Cabinet Office's Public Bodies

[1] Either expressly, or through an approved management agreement or scheme.

Handbook[2] identifies arm's length bodies as a category of public body. National Highways is therefore a public body for the purposes of section 28G.

1.1 Under s.28G(2) of the Act, a Section 28G Authority is under a general duty to take reasonable steps to further the conservation and enhancement of the SSSI, when exercising its functions.

A.4 Section 28G authorities – duty in relation to carrying out operations under S.28H

A.4.1.1 Whilst not subject to s.28E, a Section 28G Authority must give notice to NE before carrying out, in the exercise of its functions, operations likely to damage any of the flora, fauna or geological or physiographical features by reason of which a SSSI is of special interest (s.28H(1)).

A.4.1.2 In response to a notice, NE may either:

a. assent to the proposed operations (with or without conditions); or
b. refuse to assent to the proposed operations.

A.4.1.3 In the event that NE refuse to assent to the operations but the Section 28G Authority intends to proceed anyway, or NE assents but the Section 28G Authority proposes to carry out the operations other than in accordance with the terms of NE's assent, there is a mechanism by which NE can be notified of that intention so as to allow the operations to proceed. When doing so the Section 28G Authority is then subject to certain statutory safeguards concerning those operations, including a requirement to restore the site.

A.5 Offences and the reasonable excuse defence

A.5.1.1 Where a person, or Section 28G Authority, contravenes ss. 28E or 28H (as the case may be), without reasonable excuse, they will be guilty of an offence and liable on summary conviction, or on conviction on indictment, to a fine.

A.5.1.2 For the purposes of these offences, it is a reasonable excuse for a person to carry out an operation (or to fail to comply with a requirement to send a notice about it) if the operation in question—

a. was authorised by a planning permission, or otherwise permitted by a Section 28G Authority; or
b. was an emergency operation where notified to NE.

A.5.1.3 A DCO granted by the Secretary of State would comprise a permission granted by a Section 28G Authority[3], and accordingly the DCO for the Scheme (if made) would amount to a "reasonable excuse" for these purposes.

A.6 Disapplication of legislation under a DCO

A.6.1.1 Section 120(5) of the Planning Act 2008 provides that a DCO may disapply statutory provisions, subject to the other provisions in Chapter 1 of Part 7 of that Act.

A.6.1.2 Section 150 allows for the removal of a requirement for prescribed consent or authorisation only if the relevant body has consented to the inclusion of the

[2] https://www.gov.uk/government/publications/classification-of-public-bodies-information-and-guidance
[3] Provided the procedures of section 28I of the Act are followed.

provision within the DCO. The prescribed consents in England are set out in Paragraph 1 of Schedule 2 to the Infrastructure Planning (Interested Parties and Miscellaneous Prescribed Provisions) Regulations 2015.

A.6.1.3 Where a consent or authorisation is not prescribed for the purposes of s.150, the relevant statutory provisions can be disapplied without consent from the relevant regulatory body (pursuant to s.120). There is no other restriction within the relevant chapter of the Planning Act 2008 (i.e. Chapter 1 of Part 7) which otherwise restricts the application of s.120.

A.6.1.4 Sections 28E, 28G and 28H of the Act are not consents or authorisations prescribed for the purposes of s.150 of the Planning Act 2008 in England.[4] Consent from NE to disapply these sections is therefore not required to disapply those provisions in DCOs relating to NSIPs in England. Those provisions can be disapplied by virtue of s.120 of the Planning Act 2008.

A.7 Examples of disapplying SSSI consents

1.2 The disapplication of s.28E of the Act has precedent in the A14 Cambridge to Huntingdon Improvement Scheme Development Consent Order 2016 and the A303 (Amesbury to Berwick Down) Development Consent Order 2020 (albeit the latter has since been quashed for reasons not relevant to this note).

1.3 In relation to the A14 and A303 Stonehenge schemes, Natural England did not challenge the disapplication of s.28E, and ss. 28G, 28H and 28I were not the subject of discussion during examination.

A.8 Analysis

A.8.1 National Highways as Section 28G Authority

A.8.1.1 National Highways is a Section 28G Authority for the purposes of promoting highways NSIPs. National Highways is a public body and the operations involved in developing the strategic road network would flow from the proper exercise of its statutory functions.

A.8.2 Relevance of section 28E

A.8.2.1 That National Highways is a Section 28G Authority does not mean that s.28E is no longer relevant. Section 28E applies to any owner or occupier of any land included in a SSSI where they '*carry out, or cause or permit to be carried out*' any operations on that land. This provision would therefore apply in principle to any owners or occupiers of land who permit National Highways to carry out works on their land within the SSSI. It is important that s.28E is disapplied to prevent National Highways' works comprising an offence on third party land by that third party landowner or occupier (if for example works were carried out by agreement with that landowner rather that the through the exercise of compulsory acquisition powers).

A.8.2.2 The s.28E duty would also apply in respect of any new SSSI that is notified by Natural England under s.28 of the Act in respect of land within the Order limits of

[4] However, we note that s.28E is a prescribed consent in Wales pursuant to Part 2 of Schedule 2 to The Infrastructure Planning (Interested Parties and Miscellaneous Prescribed Provisions) Regulations 2015. We also note that until 2015 s. 28E was a "prescribed consent" for the purposes of the Planning Act 2008 in England.

a made DCO. There is therefore potential for additional owner/occupiers to be subject to s.28E throughout the life of a NSIP.

A.8.3 Reasonable excuse defence

A.8.3.1 In principle, the reasonable excuse defence is capable of applying to operations which would otherwise constitute an offence under both s.28E and s.28H.

A.8.3.2 We understand, from correspondence with NE on specific National Highways schemes, that NE consider that National Highways could carry out the operations permitted under a DCO in reliance on the reasonable excuse defence in s.28P(4)(a) of the Act. This defence may also be available to any owner/occupiers subject to s.28E.

A.8.3.3 We infer from this that NE considers the DCO examination and determination process to be equivalent to the notification process required under s.28H of the Act in terms of purpose and function, subject to compliance with s.28I by the SoS in determining the application.[5]

A.8.3.4 Whilst we do not disagree with NE's assessment , we think it is clearly preferable to use the disapplication route instead. This is because it provides greater clarity, since there is no need to enquire on a case by case basis whether the reasonable excuse defence applies, and would avoid any risk of procedural challenge where the authorisation process under s.28I is not strictly complied with, noting that the requirements under s.28I were not drafted with the DCO examination and consenting process in mind.

A.8.3.5 We would also note that there is some uncertainty about whether a statutory defence (of "reasonable excuse") would be available in relation to operations carried out on land which may become a notified SSSI under s.28 of the Act following the grant of the DCO, as strictly the requirements of s.28I would not have been complied with in relation to such land.

A.8.4 Mitigation and requirements

A.8.4.1 The impact of an NSIP on the notified features of relevant SSSIs is considered in detail as part of the DCO consenting process, and the control mechanisms to be put in place under a DCO should be appropriate to protect the notified features of SSSIs in so far as that protection is consistent with the delivery of the NSIP.

A.9 Conclusions and recommendation

A.9.1.1 We recommend that, as a general point of principle to be agreed with NE, both ss.28E and 28H of the Act are disapplied within National Highways DCOs. The disapplication would only apply in respect of works permitted by the DCO.

A.9.1.2 In our view it would be much better to remove any potential ambiguity in the underlying statutory code to enable the efficient delivery of an NSIP. That approach is a better fit with the DCO regime offering a "one-stop shop" for consents for NSIPs. We consider that NE's acceptance that a DCO would

[5] We note that in its Written Representation dated 15 June 2015 in connection with the A14 Cambridge to Huntingdon Improvement Scheme Development Consent Order 2016, Natural England accepted that the notice requirements of subsections 28I(2) to (4) were satisfied by way of the Secretary of State's determination of the DCO application for the scheme (section 1.7, footnote 45).

amount to a reasonable excuse defence supports this approach, which has been accepted in previous DCOs.

A.9.1.3 The protection of SSSIs, and NE's involvement within the approval process, would then be provided for within the DCO and its consenting process, as appropriate on a case-by-case basis.

A.9.1.4 We would note that we are not aware that the issues raised in this note have been explored in any great detail in the context of past DCOs.

A.9.1.5 We would invite NE to comment on this recommendation, with a view to agreeing an approach with National Highways on a national basis.

Burges Salmon LLP

BDB Pitmans LLP

19 January 2022

Annex C.7 Without prejudice consideration of mitigation for air quality effects on Epping Forest SAC

national highways

Lower Thames Crossing

Annex C.7 Without prejudice consideration of mitigation for air quality effects on Epping Forest SAC

APFP Regulation 5(2)(q)

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Annex C.7 Without prejudice consideration of mitigation for air quality effects on Epping Forest SAC

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1 Introduction

1.1 Purpose of this document

1.1.1 A Habitats Regulations Assessment (HRA) (Application Document 6.5) has been undertaken in accordance with regulation 63 of the Conservation of Habitats and Species regulations 2017 (as amended).

1.1.2 The HRA document reports the assessment of the implications of the Project on the relevant European sites' conservation objectives.

1.1.3 The HRA concluded that there would be no adverse effects on the integrity of any European sites, including due to changes in nitrogen deposition caused by changes in vehicle emissions. In relation to the assessment of Epping Forest Special Protection Area (SAC) this was on the basis that the stage 2 appropriate assessment demonstrated the effects to be 'inconsequential'. This conclusion was made on the basis that the predicted scale of the impact of N deposition would cause no consequential risk of a measurable change in the habitats as no nitrogen-sensitive species were recorded in the affected area and the area affected was a very small proportion of the SAC. Accordingly, the view of the competent expert for HRA is that no mitigation of this impact is required in order for the HRA to conclude that there would be no adverse effects on the integrity of the site.

1.1.4 However, when Natural England were consulted on the conclusions of the HRA, they disagreed with the conclusion in relation to Epping Forest SAC and have expressed the view that mitigation should be implemented to reduce the effect. In having due regard to Natural England's advice, National Highways has investigated potential mitigation options, on a without prejudice basis, and has identified a measure that would reduce the nitrogen deposition to below screening thresholds, although National Highways maintains the view that the incorporation of the measure as part of the Project is not necessary.

1.1.5 This document presents the mitigation options that National Highways has investigated and the without-prejudice measure that was identified as being feasible, including the form of a mechanism by which the mitigation measure could be secured. Natural England agree that if this additional mitigation is secured, there would be no adverse effects on the integrity of Epping Forest SAC.

1.2 Consultation

1.2.1 Details of the potential mitigation measures which could be implemented for Epping Forest SAC (in the form of a speed limit reduction on the M25 between junctions 27 and 26) were presented during the Local Refinement Consultation in May 2022. A preliminary technical note was also shared with Natural England. Natural England considers that the measure should be proposed formally as part of the Project, but agrees that it would be adequate to mitigate nitrogen deposition effects on Epping Forest SAC.

1.2.2 Accordingly, there can be certainty that the Project would not adversely affect the integrity of Epping Forest SAC, whether on the basis of National Highways' primary argument that the impact on Epping Forest SAC is inconsequential and therefore does not require mitigation, or in the alternative (and without prejudice to National Highways' primary argument), on the basis that a mitigation measure, which could be imposed on the grant of development consent, has been assessed as being feasible and Natural England agrees that the measure in question would avoid adverse effects on the integrity of Epping Forest SAC.

2 Mitigation Options Investigated

2.1 Compliance with the mitigation hierarchy

2.1.1 In circumstances where a project is likely to give rise to significant adverse effects on habitats, the National Networks National Policy Statement (NPSNN) at paragraph 5.25 states that:

"*As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought."*

2.1.2 The Project Air Quality Action Plan (PAQAP) (Application document 6.3: Appendix 5.6) reports the consideration of the mitigation hierarchy for ecologically designated sites and habitats that were concluded to be significantly affected by nitrogen deposition. However, Epping Forest SAC was not considered in the PAQAP as National Highways does not consider that there would be adverse effects on the integrity of that site which would require mitigation.

Avoidance

2.1.3 The Project has been developed to avoid or minimise significant effects on the environment through design and mitigation measures. Avoidance through design (including location and route options) has been the primary approach to mitigating adverse impacts of the Project. The design and location of specific mitigation measures over and above these avoidance measures has been developed following an iterative process based on stakeholder feedback, Project design changes and the outcomes of the environmental assessment.

2.1.4 Moving the route to avoid nitrogen deposition effects on designated sites within 200m of the new road would not avoid N deposition on the ARN. Nitrogen deposition effects are as a result of the nature of the Project, not the location and any alignment would have the same effect. Changes in N deposition at designated habitats have been calculated based on predicted changes in traffic flows. The Project route and design have been selected after extensive development, engagement, and consultation. The need for a solution to congestion at the Dartford Crossing has been subject to option studies since 2009, when a Department for Transport Study was released. Throughout the years there have numerous studies into the options for the Project up to the submission of this application for Development Consent.

2.1.5 Details of the main alternatives identified and the reasons for their adoption or rejection by the Project are summarised in ES Chapter 3 Assessment of Reasonable Alternatives (Application Document 6.1). The chapter also includes details of reappraisal work carried out to check the ongoing validity of those decisions as time has passed. Full details of the decision-making process that led to the identification of the Preferred Route are included within The Project evolution and alternatives is explained the Planning Statement (Application Document 7.2).

2.2 Measures considered

Overview

2.2.1 The advice in DMRB LA 105 (Highways England, et al., 2019) states that any mitigation measures shall be viable, and the change in concentrations (and in the case of designated sites, the change in nitrogen deposition associated with the measure) shall be quantifiable. Mitigation measures that can be quantified in LA 105 include erecting a barrier to physically stop nitrogen deposition, or measures to reduce emissions such as reducing speed limits or controlling speeds through speed enforcement management.

2.2.2 Consideration has also been given to a number of non-quantifiable measures, that theoretically may mitigate additional nitrogen deposition. This section sets out measures which have been considered for Epping Forest SAC.

Reduce the flows and/or volumes on the ARN

2.2.3 Consideration has been given to whether measures are available to reduce the increase in traffic flow as a result of the Project, as a means of reducing emissions. This measure has been discounted for all affected sites as there are no measures at a Project level that would result in a substantial change to the flows or volumes of traffic on the ARN. The objective of the Project is to improve flows on the network and so no measures that would reduce the improvements to the network would be appropriate for the Project.

Affected site management

2.2.4 Reducing other sources of nitrogen or removing nitrogen from the ecosystem may offset the effects of Project-induced nitrogen deposition. This could theoretically be achieved through measures such as removing biomass so the captured nitrogen could not be recycled. The effectiveness of these measures would only be theoretical and could not be quantified, and any such management measures would ordinarily be expected to be carried out as the normal management of European sites, and therefore no ‘additionality’ would be achieved. These measures have therefore been discounted.

Barriers

2.2.5 In line with the methodology set out in DMRB LA 105, the suitability of vertical barriers of at least 9m in height has been considered. National Highways guidance states that to achieve air quality mitigation, air quality barriers need to be at least 9m high, impermeable and continuous (to prevent air passing through it). Beyond improving air quality, the barrier needs to:

a. Respect the character and sensitivities of the surrounding area and integrate into the landscape

b. Maintain views from high sensitivity landscape and visual receptors

c. Minimise environmental impacts on the land, water, animals and plants

d. Minimise impacts on people by ensuring visual experiences are enhanced and ensuring the barriers incorporate emergency escape doors from the carriageway where necessary.

2.2.6 Based on air quality modelling it has been assumed that installing a 9m barrier on the ARN adjacent to the affected site would be effective in reducing N deposition on the affected designated site. For the purpose of this assessment, feasibility is defined as:

2.2.7 Environmental feasibility: a barrier would not give rise to significant environmental impacts such that it would not be appropriate.

2.2.8 Technical feasibility: there are no engineering limitations to the installation of the barriers. This includes sufficient space to install the barrier elements (plinth and foundations), will not cause structural issues to existing structures/features such as roads, gantries, safety barriers, vehicles, fences and existing shrubs and trees.

2.2.9 The closest section of the ARN to Epping Forest SAC is the M25 between junctions 27 and 26. This section is located within less than 15m of ancient woodland, a key environmental constraint to installation of a 9m barrier, due to potential root damage. Natural England and Forestry Commission's 'standing advice' for ancient woodland, ancient trees and veteran trees[1], states that for ancient woodlands, a buffer zone of at least 15m from the boundary of the woodland should be applied to avoid root damage (known as the root protection area). The closest section of the ARN to Epping Forest SAC is the M25 between junctions 27 and 26 ancient woodland includes Epping Forest, the boundary of which runs immediately adjacent to the M25 carriageway (less than 15m). The installation of a barrier in this location is discounted due to the potential impacts on the root protection area of this woodland.

2.2.10 In addition, from a technical perspective installation of barriers between these two junctions would not be feasible due to the topography. The elevation within this stretch of road varies from 60m and 112m. The origins of the 9m barrier designs were based around studies of a barrier in The Netherlands, where the topography was relatively flat. This measure has therefore been discounted for Epping Forest SAC.

Speed enforcement

2.2.11 National Highways' research shows that reducing emissions can be achieved by enforcement of the national speed limit. National statistics indicate that a significant proportion of the Light Duty Vehicles (LDV) exceed the speed limit (i.e. greater than 70mph). Improving the compliance to the speed limit can therefore improve emissions given that emissions increase with an increase in speed beyond the speed limit.

[1] Natural England and Forestry Commission (2022). Ancient woodland, ancient trees and veteran trees: protecting them from development. Standing advice. Accessed September 2022. https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions

2.2.12 The measure is potentially effective where the following conditions are met:

a. The speed limit on the road currently is 70mph;

b. There is a significant proportion of LDVs that are travelling in excess of the 70mph speed limit;

c. There are no current enforcement measures in place.

2.2.13 Speed enforcement is not a viable mitigation measure for the M25 between junctions 27 and 26 as TrafficMaster measured speeds show that compliance with the 70mph speed limit is high within this section and so additional enforcement measures would not lead to significantly reduced emissions as conditions detailed above are not met.

Speed limits

2.2.14 National Highways research shows that the reduction of speed limits from 70mph to 60mph would reduce vehicle emissions.

2.2.15 This measure is potentially effective where the following criteria are all met on the road affecting the designated site:

a. The road is part of the National network (and so under control of National Highways – the Project would have no powers to implement changes to management of roads on the local network)

b. The road currently has a speed limit of 70mph

c. The current traffic speed is travelling at or above the 70mph limit

2.2.16 As the criteria above have been met for the M25 between junctions 27 and 26, traffic modelling has been undertaken to identify whether a speed limit reduction would lead to unacceptable effects on the road network such as rerouting traffic onto the local network and so increasing safety risks. Traffic modelling has concluded that no significant rerouting of traffic would occur and so the measure would be feasible from a traffic and safety perspective, therefore air quality modelling has been used to determine the reduction in nitrogen deposition that would be achieved by implementing the measure.

2.2.17 The effect on introducing a 60mph speed limit on the Westbound carriageway on nitrogen deposition at Epping Forest SAC was investigated. The westbound direction was chosen as it is closest to the SAC and the increase in traffic flows as a result of the Project is greater westbound. Changes in traffic on the Eastbound carriageway would have little impact on the change in concentrations and hence N deposition on the SAC. Table 2.1 presents the maximum change in annual mean NOx (which is ultimately converted to N deposition where the change in NOx is greater than 1% of the Critical Level i.e. > 0.3µg/m^3).

Table 2.1 Maximum change in NO_x ($\mu g/m^3$) predicted in Epping Forest SAC mitigation scenario

Scenario	HRA assessed change (no speed limit)	60mph Westbound
Maximum	+0.9	0.0

2.2.18 The 60mph speed limit on the westbound carriageway would mean that there would be no change in NOx (and therefore N deposition) across Epping Forest SAC as a result of the Project.

2.2.19 Air quality modelling has confirmed that reducing the speed limit from 70mph to 60mph on the M25 westbound between junctions 27 and 26 would result in no change in NOx Concentrations and hence N Deposition in the opening year (2030). To ensure that the absolute N Deposition from the road is no higher than it would have been in the opening year (2030) without the scheme the speed limit would be required for a period of four years which is the period from the opening year until the year the total emissions of NOx with the scheme fall below the total emissions at opening year without the scheme. Details of the methodology which has been used to calculate and compare the NOx emissions at opening year are set out in Section 4.2 of the HRA, with results of the assessments also provided in Table 7.16 of the HRA (Application document 6.5). Further information on this measure (securing commitment) is presented in Section 3.

3 Conclusions and securing mechanism

3.1.1 The without prejudice assessment carried out by National Highways has concluded that a 4 year speed limit reduction from 70 mph to 60mph in the westbound direction between junction 27 and 26 of the M25 would be technically feasible, have negligible traffic impacts and reduce the level of nitrogen deposition to a level where Natural England agrees that there would be no adverse effects on the integrity of the Epping Forest SAC.

3.1.2 As set out earlier in this document and in the HRA, National Highways considers that the impact of the Project on Epping Forest SAC on account of additional nitrogen deposition would be inconsequential and accordingly it is not necessary for mitigation to be provided in order to conclude that the Project would not adversely affect the integrity of the site.

3.1.3 Without prejudice to this position, the speed limit mitigation measure could if necessary be secured through a commitment within the Register of Environmental Actions and Commitments (REAC). The REAC (Application Document 6.3: Appendix 2.2) forms part of the Code of Construction Practice (CoCP). The REAC presents the essential mitigation commitments that need to be implemented in the delivery, management, monitoring and maintenance of the Project, and acts as a securing mechanism for the essential mitigation measures identified in the ES.

3.1.4 The commitment to reduce the speed limit from 70 mph to 60mph in the westbound direction between junction 27 and 26 of the M25 would follow a similar approach to REAC commitment TB025. Commitment TB025 relates to the mitigation of nitrogen deposition along part of the M2, through provision of appropriate technology and infrastructure to enable the enforcement of the current speed limit (see Table 3.1 below). The principal difference is that the potential commitment relating to the M25 would relate to a temporary speed limit reduction and not management of speed enforcement. Appropriate technology and infrastructure to enable the enforcement of the new speed limit is already installed on the relevant section of the M25 and the temporary speed limit reduction could be enforced under the variable speed limit regulations that apply to this section of the M25.

3.1.5 The wording of a REAC commitment that National Highways considers would be appropriate to secure the temporary speed limit reduction on a section of the M25 is provided in Table 3.2, without prejudice to National Highways' primary position that the mitigation would not be required and is not proposed as part of the Project.

Table 3.1 Extract of REAC commitment TB025

Topic	REAC ref. no.	Name	Origin	Commitment	Achievement criteria	Party responsible	Stage	Securing mechanism
Terrestrial Biodiversity	TB025	Mitigation of nitrogen deposition along part of the M2	ES 8.5.16	Appropriate technology and infrastructure would be installed to enable the enforcement authority to enforce the speed limit in both directions between junctions 3 and 4 of the M2 to reduce nitrogen deposition. Reasonable and appropriate funding would be provided to the enforcement authority to undertake enforcement activities in relation to nitrogen deposition, in addition to existing enforcement measures. This technology and infrastructure would be developed through detailed design, in consultation with the enforcement authority and approved by the Secretary of State. It would be in place prior to road opening. This would remain in place as a minimum during the first fifteen years of operation, unless otherwise agreed with the Secretary of State based on reviews undertaken in consultation with Natural England and the enforcement authority.	Provision of speed enforcement technology and infrastructure as agreed with the enforcement authority.	National Highways	Operation	EMP3 – Requirement 4

Table 3.2 Without-prejudice measure commitment for Epping Forest SAC

Topic	REAC ref. no.	Name	Origin	Commitment	Achievement criteria	Party responsible	Stage	Securing mechanism
Habitats Regulations Assessment	XX	Mitigation of nitrogen deposition along part of the M25		Use the existing variable speed technology and infrastructure to ensure the maximum speed limit on the M25 westbound between junctions 27 and 26 is 60mph (other than in cases of emergency) for four years from the road opening unless otherwise agreed with SoS based on reviews undertaken in consultation with Natural England.	Maximum speed limit set as 60mph (other than in cases of emergency) for 4 years following road opening	National Highways	Operation	EMP3 – Requirement 4

References

Highways England, Transport Scotland, Welsh Government & Department for Infrastructure, 2019. *Design Manual for Roads and Bridges LA105 Air Quality.* [Online]
Available at: https://www.standardsforhighways.co.uk/prod/attachments/84e6ac61-561a-49a8-af95-2dbe1fc5faa1
[Accessed March 2020].

Highways England, Transport Scotland, Welsh Government & Department for Infrastructure, 2020a. *Design Manual for Roads and Bridges LA 115 Habitats Regulations assessment.* [Online]
Available at: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section4/LA%20115%20Habitats%20Regulations%20assessment%20-web.pdf
[Accessed Mar 2020].

Planning Inspectorate, 2022. *Habitats Regulations Assessment: Advice note ten - Habitats Regulations Assessment for nationally significant infrastructure projects, version 9.* [Online]
Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/
[Accessed August 2022].

Glossary

Term	Abbreviation	Explanation
A122		The new A122 trunk road to be constructed as part of the Lower Thames Crossing project, including links, as defined in Part 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1)
A122 Lower Thames Crossing	**Project**	A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
Application Document		In the context of the Project, a document submitted to the Planning Inspectorate as part of the application for development consent.
Construction		Activity on and/or offsite required to implement the Project. The construction phase is considered to commence with the first activity on site (e.g. creation of site access), and ends with demobilisation.
Design Manual for Roads and Bridges	**DMRB**	A comprehensive manual containing requirements, advice and other published documents relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (National Highways, Transport Scotland, the Welsh Government or the Department for Regional Development (Northern Ireland)) is highway authority. For the A122 Lower Thames Crossing the Overseeing Organisation is National Highways.
Development Consent Order	**DCO**	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.
Development Consent Order application	**DCO application**	The Project Application Documents, collectively known as the 'DCO application'.
Environmental Statement	**ES**	A document produced to support an application for development consent that is subject to Environmental Impact Assessment (EIA), which sets out the likely impacts on the environment arising from the proposed development.
Highways England		Former name of National Highways.
National Highways		A UK government-owned company with responsibility for managing the motorways and major roads in England. Formerly known as Highways England.
National Planning Policy Framework	**NPPF**	A framework published in March 2012 by the UK's Department of Communities and Local Government, consolidating previously issued documents called Planning Policy Statements (PPS) and Planning Practice Guidance Notes (PPG) for use in England. The NPPF was updated in February 2019 and again in July 2021 by the Ministry of Housing, Communities and Local Government.
National Policy Statement	**NPS**	Set out UK government policy on different types of national infrastructure development, including energy, transport, water and waste. There are 12 NPS, providing the framework within which Examining Authorities make their recommendations to the Secretary of State.

Term	Abbreviation	Explanation
National Policy Statement for National Networks	**NPSNN**	Sets out the need for, and Government's policies to deliver, development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.
Nationally Significant Infrastructure Project	**NSIP**	Major infrastructure developments in England and Wales, such as proposals for power plants, large renewable energy projects, new airports and airport extensions, major road projects etc that require a development consent under the Planning Act 2008.
Operation		Describes the operational phase of a completed development and is considered to commence at the end of the construction phase, after demobilisation.
Project road		The new A122 trunk road, the improved A2 trunk road, and the improved M25 and M2 special roads, as defined in Parts 1 and 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1).
Project route		The horizontal and vertical alignment taken by the Project road.

Annex C.8 Underwater noise and the effect on bird features of the Thames Estuary and Marshes SPA/Ramsar

1 Technical Paper - Underwater noise and the effect on bird features of the Thames Estuary and Marshes SPA/Ramsar

1.1 Introduction

This technical note covers the following.

1. An explanation of the approach used by LTC in the assessment of the effects of changes in underwater noise on the bird features of the Thames Estuary and Marshes SPA and Ramsar site as submitted in the application for the DCO.
2. Following Natural England's advice, a literature review on the sensitivity of diving birds to underwater noise.
3. Based on the evidence found within the literature review consideration as to whether or not the approach to reporting the effect of underwater noise on the bird features of the Thames Estuary and Marshes SPA and Ramsar site is appropriately reported.

1.2 Approach used by LTC in the assessment

The key point of the submitted HRA is that the conclusion that LSE as a result of underwater noise can be discounted as there is no feasible pathway to an effect. This is considered an appropriate conclusion as it is based on the evidence that the highest level of noise from the TBM (worst case directly above the cutter head) is 130dB re 1*μ*Pa (SPL) which will not be perceived in the water column given the levels of noise from shipping (i.e. background noise) are within the range of 153-158 dB re 1 *μ*Pa. The noise level produced by the TBM in the water column is lower than the noise already in water column and so no change in underwater noise will occur. The sensitivity of any receptor to noise is therefore irrelevant as however sensitive the receptor was, there would be no perception of change.

Natural England's advice is that the robustness of the conclusions of the HRA could be improved by the use of sensitivity threshold units that could be translated to birds with particular reference to the use of the 20*μ*Pa reference value, the latter value being taken from a paper by Larsen *et al* 2020 (as confirmed at the follow up meeting with Natural England to discuss their Relevant Representation). The following paragraphs provide a discussion of our review of that paper and others to determine if appropriate sensitivity thresholds are available for diving birds in relation to underwater noise.

With regard to the use of a 20*μ*Pa reference value we would make the following comment. Sound intensity is measured by the standard unit, a decibel (dB). A simple explanation is provided on the Discovery of sound in the sea (DOSITS) web pages created by the University of Rhode Island Graduate School of Oceanography, which states "*Decibels are a relative unit comparing two pressures; therefore, a reference pressure must also be indicated. In underwater acoustics, the reference pressure is 1 µPa, so the true unit of intensity for underwater sound is dB referenced to 1 µPa. In air, scientists have agreed to use a higher reference pressure of 20 µPa. Therefore, the true unit of intensity for sounds in air is dB referenced to 20 µPa. Because they use different reference pressures, sound intensity given in dB in water is not the same as sound intensity given in dB in air."*

The noise predicted to occur in the River Thames as result of the TBM is measured in dB re 1 *μ*Pa which is how continuous underwater noise is recorded as standard[1].

1.3 Literature review of evidence on sensitivity of diving birds to underwater noise

In relation to the assessment of bird hearing underwater, we have reviewed the paper by Larsen *et al* (2020) and would include consideration of it as follows.

Larsen *et al* (2020) reported the average of underwater ABR (auditory brainstem response) threshold at BF (Best frequency) was 84dB re 1*μ*Pa and the average in-air ABR threshold at BF was 53 dB re 20*μ*Pa. To provide comparable figures Larsen *et al* stated that "*To directly compare the shape and sensitivity of ABR threshold curves in air and underwater, the sound pressure threshold values were all related to 1 µPa. This is equivalent to adding 26 dB to the in-air thresholds, which had been measured relative to 20 µPa."* In the paper's abstract the

1 https://www.npl.co.uk/special-pages/guides/gpg133underwater - "2.3 Recommended metrics for reporting underwater sound - The metric most suitable for continuous sounds is Sound Pressure Level (SPL)." & "Note that the reference value of SPL for sound in water is one micropascal (1 µPa), leading to SPL being expressed in units of decibels relative to 1 µPa, or alternatively dB re 1 µPa."
Other examples of standard reporting of underwater noise can be found at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/197303/SEA6_Noise_QinetiQ.pdf

comparable numbers are given to the reference of 20 *µPa* but with the results section of the paper the comparison is done with reference to the standard underwater reference[1].

The purpose of the Larsen *et al* (2020) paper was to determine if cormorant had any specific adaptation to use hearing in water. The findings were not conclusive as there was no significant difference between the average in air and in water ABR thresholds. It is not considered appropriate therefore to use the conclusions of this paper to determine thresholds above which cormorant could be sensitive to noise in the water column in the way that many HRAs rely on the Cutts *et al* paper when using the 50dB threshold for disturbance to birds during construction.

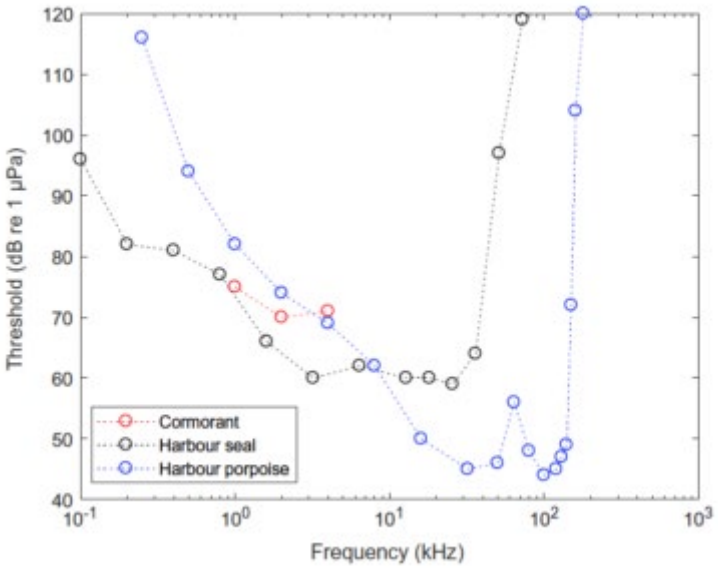
Other research into the effect of underwater noise on birds appears to be limited in the literature compared to research into whether or not underwater feeding birds can hear or use hearing to feed as set out in Larsen et al 2020 and a further example by Zeyl et al (2022). Zeyl et al (2022) found that "*Although there are limited empirical data on hearing sensitivity of birds underwater, mounting evidence indicates that diving birds detect and respond to sound underwater, suggesting that some modifications of the ear may assist foraging or other behaviors below the surface*."

Effects on fish and cetaceans by comparison are well studied with numerous policies and legislation in force worldwide with particular reference to cetaceans. There are some examples of evidence within the literature that the sensitivity of underwater birds is similar to that of seals and cetaceans.

The University of Rhode Island Graduate School of Oceanography (2002-2023) published results of evidence on their "Discovery of sound in the sea (DOSITS)" web pages that stated "*The underwater hearing threshold of a 6-year old, male great cormorant was measured using behavioral testing methods in a large pool with an underwater listening station. The bird learned to detect the presence or absence of a 0.5 s pure tone while submerged. Greatest underwater hearing sensitivity found to occur at 2 kHz with an underwater hearing threshold of 71 db re 1µPa rms (underwater dB). The great cormorant is better at hearing underwater than expected, with a hearing threshold comparable to seals and toothed whales in the frequency band of 1-4 kHz*." The accompanying figure is replicated below in Plate 1 and clearly indicates that the thresholds (which are to a *1 µPa reference scale)* for cormorant are broadly similar to common seal and harbour porpoise.

Hansen et al (2020) reported that "*The lowest levels that elicited behavioral responses in the birds, 110 dB re 1 µPa, were surprisingly low. These sound levels are similar to the ones known to affect harbour porpoise behavior for sounds of comparable frequencies"*

Plate 1: Underwater hearing thresholds of a harbor seal (black dots), harbor porpoise (blue dots) (Kastelein et al. 2010; Reichmuth et al. 2013) compared with the great cormorant (red dots). Reprinted with permission from Hansen, K. A., Maxwell, A., Siebert, U., Larsen, O. N., & Wahlberg, M. (2017). Great cormorants (Phalacrocorax carbo) can detect auditory cues while diving. The Science of Nature, 104(5–6).



It appears that the available evidence would suggest therefore that an assessment of bird underwater hearing should be carried out as is carried out for seals and cetaceans. Natural England advised that a similar approach to that taken in the marine mammal assessment should be taken for birds, but with bird-specific thresholds. As there appears to be no

literature source for a robust bird-specific threshold, it is considered that the assessment of effects on marine mammals is an appropriate proxy for underwater feeding birds.

The thresholds used in the LTC marine biodiversity assessment and so reference to that assessment, as has been done in the stage 1 section of the HRA report is considered to be an appropriate technical approach.

1.4 Conclusion

The assessment of underwater noise on marine mammals is considered an appropriate proxy for diving birds as shown in the literature (Hansen et al (2020) and DOSITS University of Rhode Island) and concluded that any marine mammals in the vicinity of the works would be unable to detect TBM operations above background levels.

It is therefore concluded that the DCO application HRA screening assessment remains robust following this review, as there is no feasible pathway to an effect based upon no perceivable change in the noise and the thresholds of cetaceans as a proxy. LSE can be discounted on the basis of no pathway existing and there is therefore no requirement for stage 2 appropriate assessment.

1.5 References

Zeyl JN, Snelling EP, Connan M, Basille M, Clay TA, Joo R, Patrick SC, Phillips RA, Pistorius PA, Ryan PG, Snyman A, Clusella-Trullas S. *Aquatic birds have middle ears adapted to amphibious lifestyles.* Sci Rep. 2022 Mar 28;12(1):5251. doi: 10.1038/s41598-022-09090-3. PMID: 35347167; PMCID: PMC8960762. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8960762/#:~:text=Although%20there%20are%20limited%20empirical,other%20behaviors%20below%20the%20surface.

Kirstin Anderson Hansen, Ariana Hernandez, T. Aran Mooney, Marianne H. Rasmussen, Kenneth Sørensen, and Magnus Wahlberg (2020) *The common murre (Uria aalge), an auk seabird, reacts to underwater sound* The Journal of the Acoustical Society of America 147, 4069; doi: 10.1121/10.0001400. Available at: https://www2.whoi.edu/site/amooney/wp-content/uploads/sites/31/2020/07/10.0001400.pdf

Discovery of sound in the sea (DOSITS) University of Rhode Island Graduate School of Oceanography (2002-2023) Available at: https://dosits.org/animals/sound-reception/how-do-aquatic-birds-hear/

Annex C.9 Shorne and Ashenbank Woods SSSI Compensation

Lower Thames Crossing

Shorne and Ashenbank Woods SSSI compensation

Purpose

The purpose of this technical note is to address a question from Natural England regarding which specific areas within the Project design are proposed as compensation for the loss of habitats within the boundary of Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI).

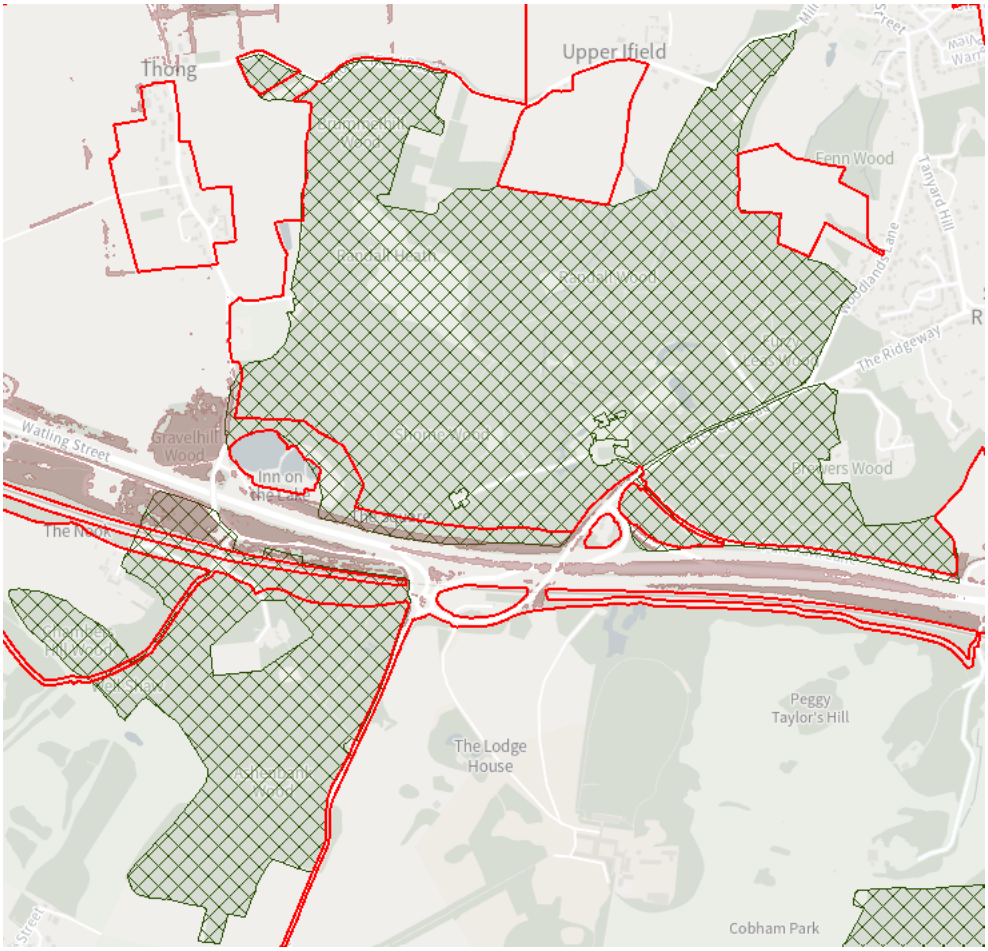
Compensation proposals

As a result of the construction and operation of the Project, there would be a direct habitat loss from within the boundary of Shorne and Ashenbank Woods SSSI of 5.85ha. This is detailed within 6.1 Environmental Statement – Chapter 8 – Terrestrial Biodiversity [Application Document APP-146], paragraphs 8.6.9 – 8.6.11. Plate 1 below shows the SSSI together with the Project's Order Limits and the areas within those Order Limits where the removal of vegetation is proposed. This is demarcated by the light brown shading. The areas and habitat types lost are set out within Table 1 below.

Table 1 Habitat type and areas within Shorne and Ashenbank Woods SSSI lost as a result of the Project.

Habitat type	Area of habitat lost
Ancient woodland	**0.95ha**
Semi-natural woodland	**1.80ha**
Plantation woodland	**0.81ha**
Open mosaic habitats	**0.91ha**
Hardstanding	**1.38ha**
TOTAL	**5.85ha**

Plate 1 Shorne and Ashenbank Woods SSSI and the areas where vegetation loss as a result of the Project overlaps with that designation.



When considering appropriate compensation for the loss of these habitats from Shorne and Ashenbank Woods SSSI, the Project has looked to create greater areas of equivalent habitat that would either directly link to the SSSI boundary, or be as closely linked to the SSSI as possible. In designing these areas, the use of loss:gain ratios has not been employed. This is in line with the approach discussed with Natural England during the early stages of project design. However, reference to loss:gain ratios are used in this technical note for illustrative purposes only.

Table 2 below details the areas of habitat creation proposed to compensate for those lost within the SSSI as a result of the Project, together with a rationale for their inclusion as appropriate compensation for the habitat losses detailed in Table 1. These areas are shown in Figure 1.1. Areas of hardstanding have been omitted from this table.

Table 2 Compensation habitat type proposals and rationale for their inclusion.

Habitat type lost	Compensation habitat type (landscape typology given in brackets)	Justification for inclusion	Area of compensation habitat proposed	Approximate ratio of area created for compensation to that being lost
Ancient woodland	Ancient woodland compensation planting (LE8.2) Plate 2 below	The location for this woodland creation would be an extension of Randall Wood on the northern boundary of the SSSI. The site is immediately adjacent to the woodland boundary, along a 280m length. Its location would also result in a corridor to Brummelhill Wood, also within the SSSI boundary, via existing woodland habitat.	9.1ha	9.6 : 1
Semi-natural woodland Plantation woodland	Woodland (LE2.1) Plate 3 and Plate 4 below	This woodland habitat compensation is mainly proposed for land immediately west of Thong Lane and adjacent to Shorne Wood. This area of planting would align with the habitat loss within the SSSI boundary that lies between the A2 and HS1 and consists of a mix of broadleaf and plantation woodland which has developed following the construction of those two infrastructure projects. As well as this large area of planting, a second smaller area of woodland planting is proposed adjoining the western edge of Brummelhill Wood (part of the SSSI), and is immediately north of the proposed area of open mosaic habitat creation described below.	10.6ha	4.0 : 1
Open mosaic habitats	Open mosaic habitats (LE8.1) Plate 5 below	This habitat area lies immediately adjacent to Shorne Wood, their boundaries aligning along a 450m stretch, and would compensate for the loss of scrub and open habitats within the SSSI.	12.8ha	14.1 : 1

Landscape typologies align with those presented in 6.2 Environmental Statement - Figure 2.4 - Environmental Masterplan Sections [Application Documents APP-160] and 6.7 Outline Landscape and Ecology Management Plan [Application Document APP-490]. These documents secure the creation and long-term management of these habitat compensation proposals.

Plate 2 Ancient woodland compensation planting LE8.2. (9.1ha)

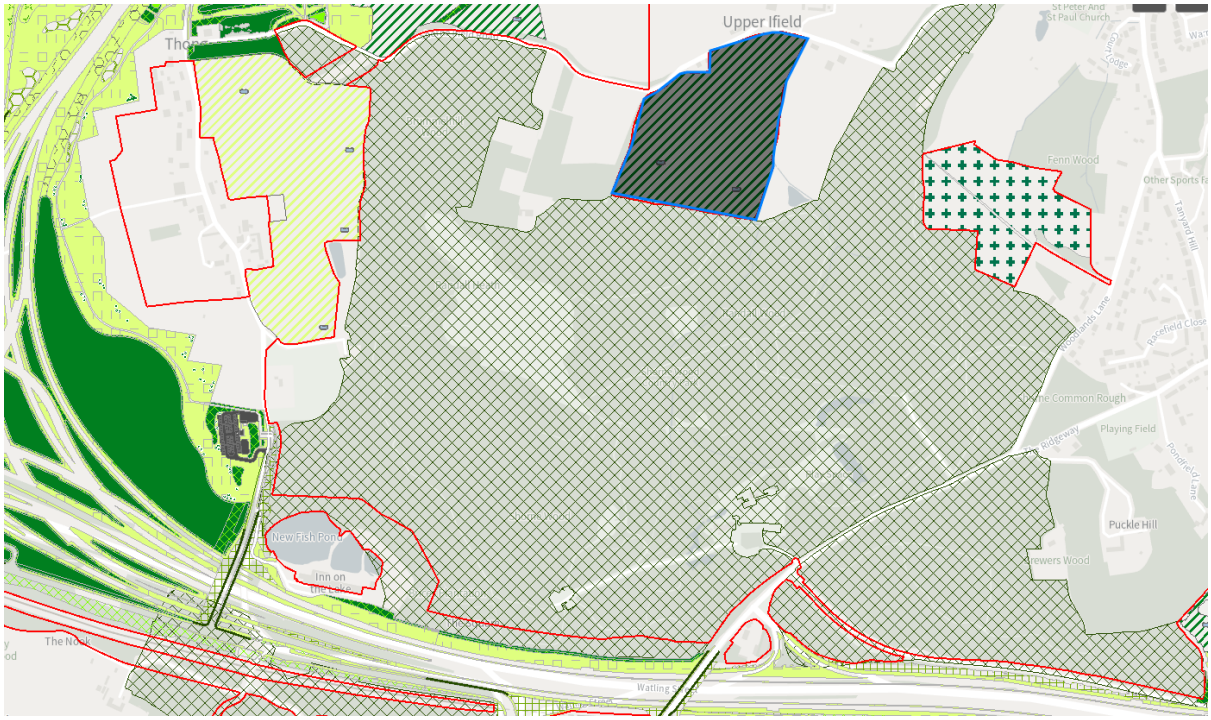


Plate 3 Woodland LE2.1. (10.0ha)

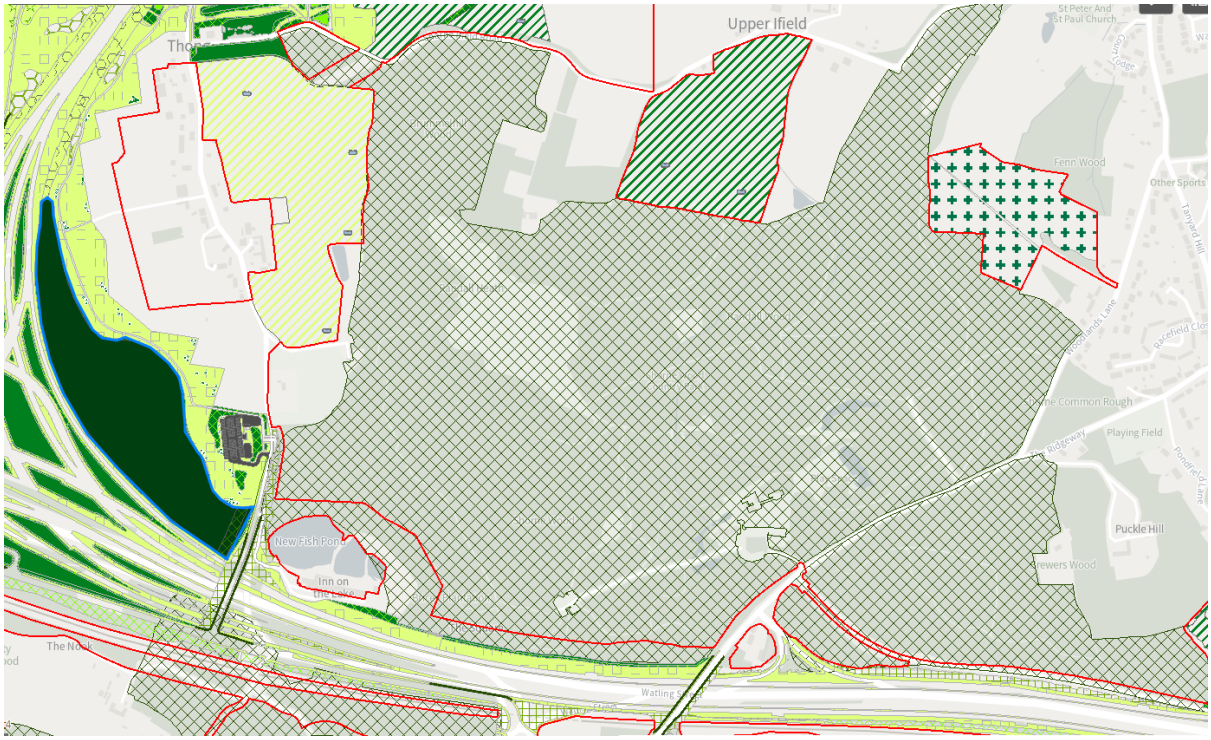


Plate 4 Woodland LE2.1. (0.6ha)

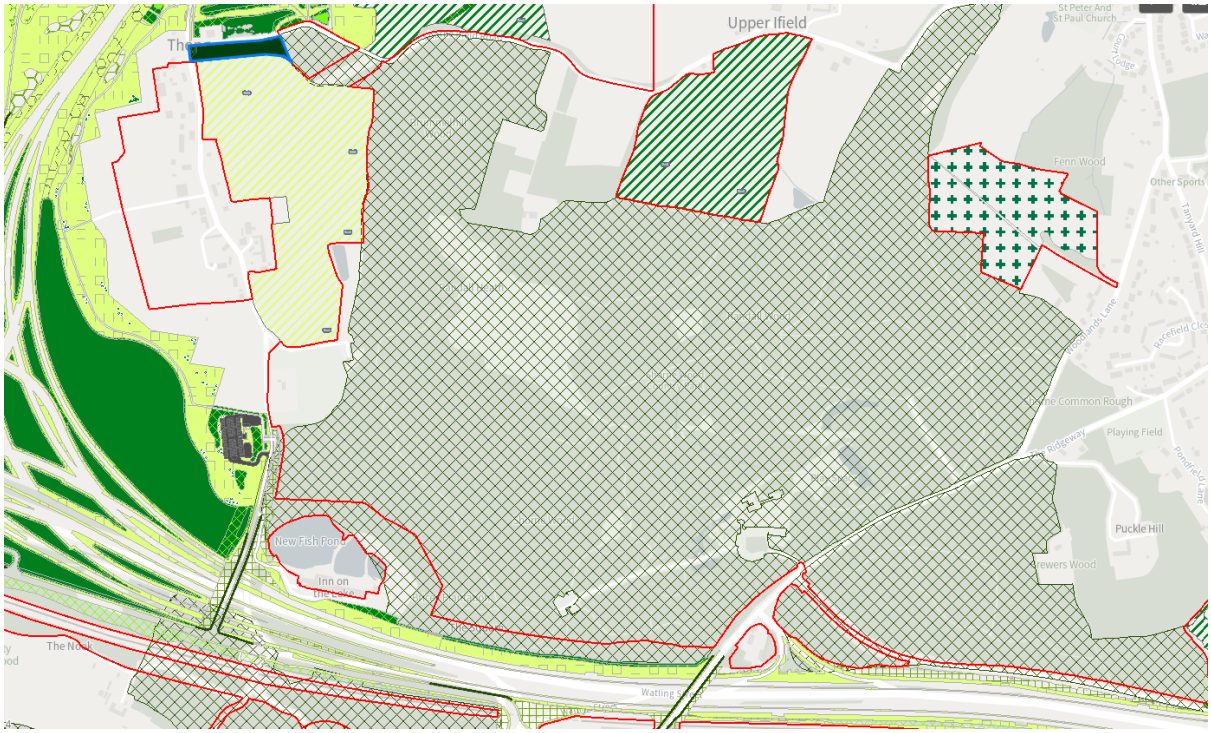
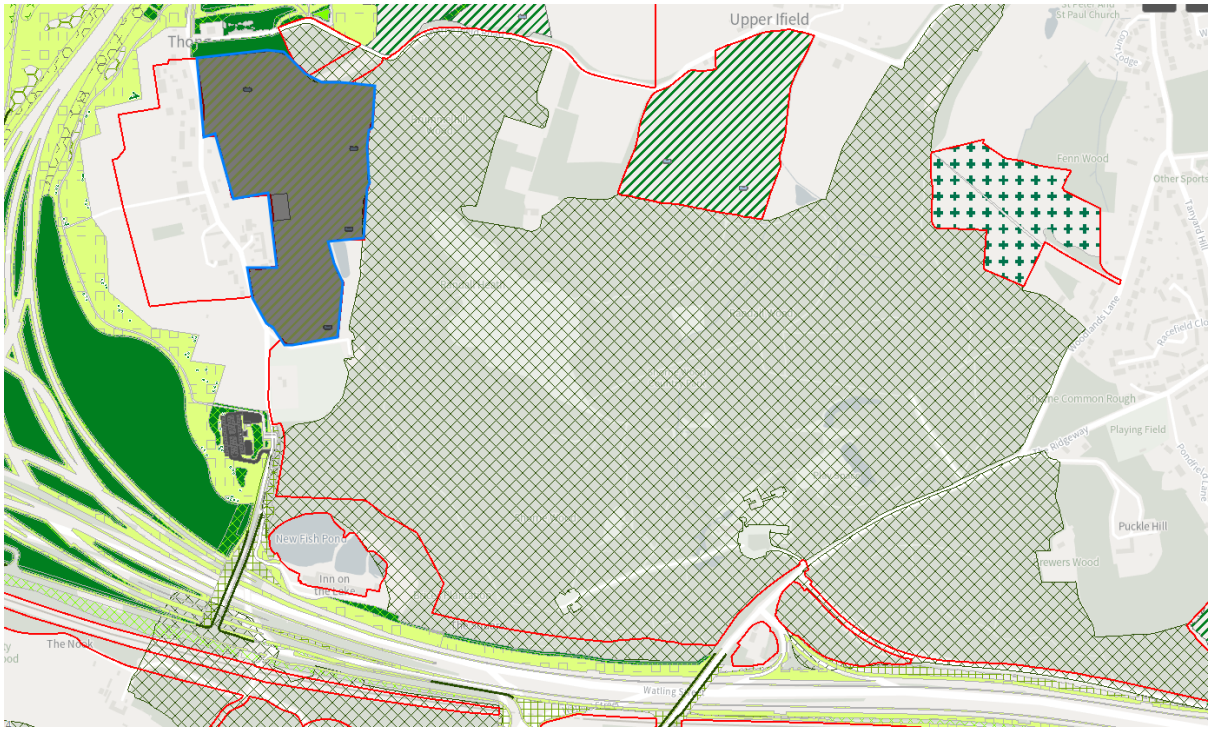


Plate 5 Open mosaic habitats LE8.1. (12.8ha)



Overlap with ancient woodland compensation planting proposals

Areas of designated ancient woodland form part of the SSSI, and the Project would result in the loss of 0.95ha of ancient woodland that falls within the boundary of the SSSI. Within 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [Application Document APP-146], an assessment of the loss of ancient woodland is

reported in paragraph 8.6.53 and Table 8.31. The total area of ancient woodland loss south of River Thames is 5.35ha, with proposed compensation planting of 48.75ha.

To address concerns around the potential for double counting compensation for ancient woodland loss and that for SSSI habitat loss, Table 3 below sets out ancient woodland loss both within and outwith the SSSI boundary, and offers gain : loss ratios for each.

Table 3 Breakdown of ancient woodland habitat loss and associated compensation planting in relation to the SSSI boundary

Location of ancient woodland	Ancient woodland loss	Ancient woodland compensation planting	Approximate ratio of area created for compensation to that being lost
Within SSSI boundary	0.95	9.10	9.6 : 1
Outwith SSSI boundary	4.40	39.65	9.0 : 1
Combined	5.35	48.75	9.1 : 1

Area 4:
10 ha

Area 2:
0.7 ha

Area 1:
12.9 ha

Area 3:
9.2 ha

0 125 250 375 500
M

Legend

- Shorne and Ashenbank Woods SSSI compensation area
- Order Limits
- Site of Special Scientific Interest
- LE1.3 species rich grassland
- LE1.31 species rich chalk grassland
- LE1.32 annual wildflower grassland
- LE1.4 rock and scree
- LE2.1 native woodland and woodland edge planting
- LE2.2 woodland edge
- LE2.4 linear belt of shrubs and trees
- LE2.5 shrubs with intermittent trees
- LE2.7 scattered trees
- LE2.8 scrub
- LE2.11 woodland with non-native species
- LE4.3 native species hedge (untrimmed)
- LE4.4 native hedgerow with trees
- LE5.1 individual trees
- LE6.4 wet grassland
- LE6.11 water bodies - standing water
- LE7.3 car park
- LE8.1 open mosaic habitat
- LE8.2 Ancient Woodland compensation planting
- LE8.5 ecology pond (indicative symbol)
- LE8.7 nitrogen deposition mitigation planting

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P01	S8	23/06/2023	DCO Application	AR	LK	NC

Client: national highways

Project: LOWER THAMES CROSSING

Status: DCO APPLICATION
Original Size: A3
Revision: P01
Application Document Number: N/A
Scale: 1:10,000

Drawing Title:
Figure 1.1 -
Shorne and Ashenbank Woods SSSI
Compensation Area

Drawing Number:
HE540039-CJV-EBD-SZP_EN000000_-DR-LE-00001

Annex C.10 Acid Grassland Compensation Proposals

Lower Thames Crossing

Acid grassland compensation proposals

Author: [redacted]

Purpose

The purpose of this technical note is to address an issue raised by Natural England in their Relevant Representations for Lower Thames Crossing. Key Issue Ref. NE23, in Table 2.7, details questions around the assessment of, and compensation for, impacts to acid grassland as a result of the Project. These are addressed below.

Assessment of Project impacts on acid grassland

No acid grassland has been recorded within the Project zone of influence south of the River Thames. North of the River Thames, in Essex, this ecological receptor was valued at a County level of importance. Although this habitat is listed as 'lowland dry acid grassland' habitat of principal importance in line with the requirements of section 41 of the NERC Act 2006, the total area within the Project zone of influence (2.34ha) was considered in relation to the wider resource within Essex which Natural England reports as being "between 100 and 500ha, possibly more"[1]. This represented between 0.5 – 2.0% of the county resource of acid grassland being within the zone of influence of the Project. It is therefore considered that the habitat is likely to appreciably enrich the habitat resource at a county level and provide habitat features that are of importance for migration, dispersal and genetic exchange of species and therefore meets the DMRB (Highways England, 2020a) criteria for being of County importance, as outlined in 6.1 Environmental Statement Chapter 8: Terrestrial Biodiversity **[Application Document APP-146]**, Table 8.5.

Adverse effects on acid grassland are reported in 6.1 Environmental Statement Chapter 8: Terrestrial Biodiversity **[Application Document APP-146]**, specifically Table 8.35 Habitat losses and gains associated with the Project to the north of the River Thames, and in paragraph 8.6.267. These show a combined total loss of acid grassland of 0.53ha from Low Street Pit Local Wildlife Site (LWS) and Blackshots Nature Area LWS. However, this has been identified as inconsistent with the figures presented within 6.3 Environmental Statement - Appendix 8.21 - Biodiversity Metric Calculations **[Application Document APP-417]**, and is therefore an error which will be picked up in the errata log. The accurate figures for loss of acid grassland as a result of the Project are presented in Table 1 below:

Table 1 Location and area of acid grassland lost as a result of the Project

Location of acid grassland loss	Area of acid grassland loss
Low Street Pit LWS	0.61 ha
Blackshots Nature Area LWS	0.17 ha
Mucking Heath LWS	0.36 ha
TOTAL	1.14 ha

[1] Natural England publications. 13: Essex. https://publications.naturalengland.org.uk/file/73005. Accessed 17/05/23.

Compensation for Project impacts

Table 8.35 and paragraph 8.6.267 in 6.1 Environmental Statement Chapter 8: Terrestrial Biodiversity **[Application Document APP-146]**, report the extent of acid grassland habitat creation proposed to compensate for this loss: 5.03ha of habitat provision located in the south of a 42ha ecological mitigation area north of Coalhouse Fort which includes the creation of open mosaic habitat. The location of this habitat creation is reported in 6.2 Environmental Statement - Figure 2.4 - Environmental Masterplan Section9 (5 of 10) [Application Documents APP-163], sheets 18, 21, and 22. For ease of reference these are reproduced below in Plate 1 and Plate 2. The creation and long-term management of this area is reported in 6.7 Outline Landscape and Ecology Management Plan **[Application Document APP-490]**, section 6.4, with section 8.22 covering open mosaic habitats, and 8.27 covering acid grassland creation. Acid grassland creation includes the proposal to salvage viable soils from those areas of habitat loss and use them to inoculate the proposed acid grassland habitat creation area.

Natural England Relevant Representation on acid grassland

Natural England, in their Relevant Representation Key Issue Ref. NE23, highlight a concern around the potential success of the proposed acid grassland creation within the area shown in Plate 2. The importance of the underlying “Thames Terrace Gravel” is also in relation to Low Street Pit LWS. As a result, further consideration of the location and extent of this proposal has been undertaken.

A key consideration of the viability of a site to create acid grassland is soil pH. As detailed in 6.2 Environmental Statement - Figure 10.2 - Soil Scape Mapping **[Application Document APP-300]**, page 4 of 6 shows soil pH within the area north of Coalhouse Fort. This is reproduced below in Plate 3. The information shows that the area identified for acid grassland creation has a mix of free draining slightly acidic soils, and loamy/clayey soils of coastal and floodplain environments. This is similar to the Low Street Pit site which is the principal area of acid grassland affected by the Project and therefore the main source of soil salvaged for the area of acid grassland creation north of Coalhouse Fort. However, the predominant soil type at Low Street Pit LWS is free draining slightly acidic soils whereas at the proposed acid grassland creation site, the predominant soil type is loamy and clayey soils of coastal flats.

With respect to the underlying superficial deposits within this area, 6 .2 Environmental Statement - Figure 10.6 - Superficial Deposits **[Application Document APP-304]**, reports this information. This is reproduced below in Plate 4. This shows Low Street Pit LWS as having superficial deposits of Taplow gravel member, HEAD deposits, and alluvium. All three of these deposits are present within the acid grassland creation area and, within the wider ecological mitigation area, there is the additional Lynch Hill gravel member.
Regarding the suitability of the ecological mitigation area to support acid grassland creation, the area’s underlying superficial deposits and the existing soil pH is a close match to the main site of acid grassland impact at Low Street Pit LWS. This is understandable given the proximity of the two area, being within 1km at their closest point. The underlying superficial deposits across the ecological mitigation area should support similar free draining grassland to those found at Low Street Pit LWS. In terms of the location for acid grassland creation within the wider ecological mitigation area, the north appears a closer match in terms of soil pH than the south;

the north being predominantly free draining slightly acid loamy soils rather than the mix of soil types found further south.

The southern area is separated from the wider ecological mitigation area by the presence of a mature hedgerow running west - east across the site, which has the potential to constrain the nature spread of acid grassland species. Such a constrain is not present at the northern end of the ecological mitigation area which could then allow the natural colonisation of a larger proportion of this area by acid grassland species. Although, in theory, the area of open mosaic habitat would decrease should the area of acid grassland increase, it is considered that the two habitats are complementary, both having the potential to support important assemblages of vascular plant and terrestrial invertebrate species. Any slight shift in the proportion of acid grassland to open mosaic habitat in this ecological mitigation area, or across the Project as a whole, is considered inconsequential.

It is therefore proposed that the acid grassland creation site which is currently located to the south of the ecological mitigation area be moved to the northern area (see Plate 5 for indicative location / extent), with open mosaic habitat replacing the acid grassland creation in the south. Overall there would be no significant change in the provision of these habitats as detailed within 6.1 Environmental Statement Chapter 8: Terrestrial Biodiversity **[Application Document APP-146]**, although the provisions of 6.7 Outline Landscape and Ecology Management Plan **[Application Document APP-490]**, would allow for changes in management of these two habitat typologies within this area to maximise its biodiversity value.

Hydrogeological conditions

Recent discussions during the fortnightly meetings held between the Project and Natural England have included a concern raised by Natural England regarding the hydrogeological conditions of the ecological mitigation area, specifically whether ground water levels may be too high to support the acid grassland and open mosaic habitats proposed for this site. The Project's hydrogeology team has considered this concern and their conclusions are presented below.

There is no available Project-specific ground investigation data available to assess groundwater levels. However, limited historical boreholes and British Geological Survey mapping, supported by a review of historical aerial imagery (Google Earth) show no widespread evidence of shallow groundwater levels such as would be evidenced by numerous small ponds or an extensive network of ditches within the area. Extensive dark patches of vegetation within the area, which would indicate shallow groundwater levels, are also absent from historic aerial imagery.

Available topographical elevation information comprises Ordnance Survey maps which show approximately half of the study area, on the western side as above 5mAOD, rising to a maximum of 13mOAD. Here the British Geological Survey published geology comprises river terrace gravels and the ground would be expected to be well drained. The remainder of the study area is mapped as between less than 5mAOD but there is no ground shown at 0mAOD or less within the ecological mitigation area. Here the British Geological Survey published geology comprises alluvium over sands and gravels. The limited historical water level records include confirmation that the sands and gravels that lie beneath the Alluvium are confined by the Alluvium. Combined with the lack of evidence for presence of water logging shown by the aerial imagery, it is a fair assessment, based on the available

information, that wet ground conditions due to shallow groundwater would not be expected within the ecological mitigation area, and that groundwater levels would therefore not be a constraint in terms of creating the target acid grassland and open mosaic habitats.

Plate 1 Ecological mitigation area north of Coalhouse Fort (shaded grey).

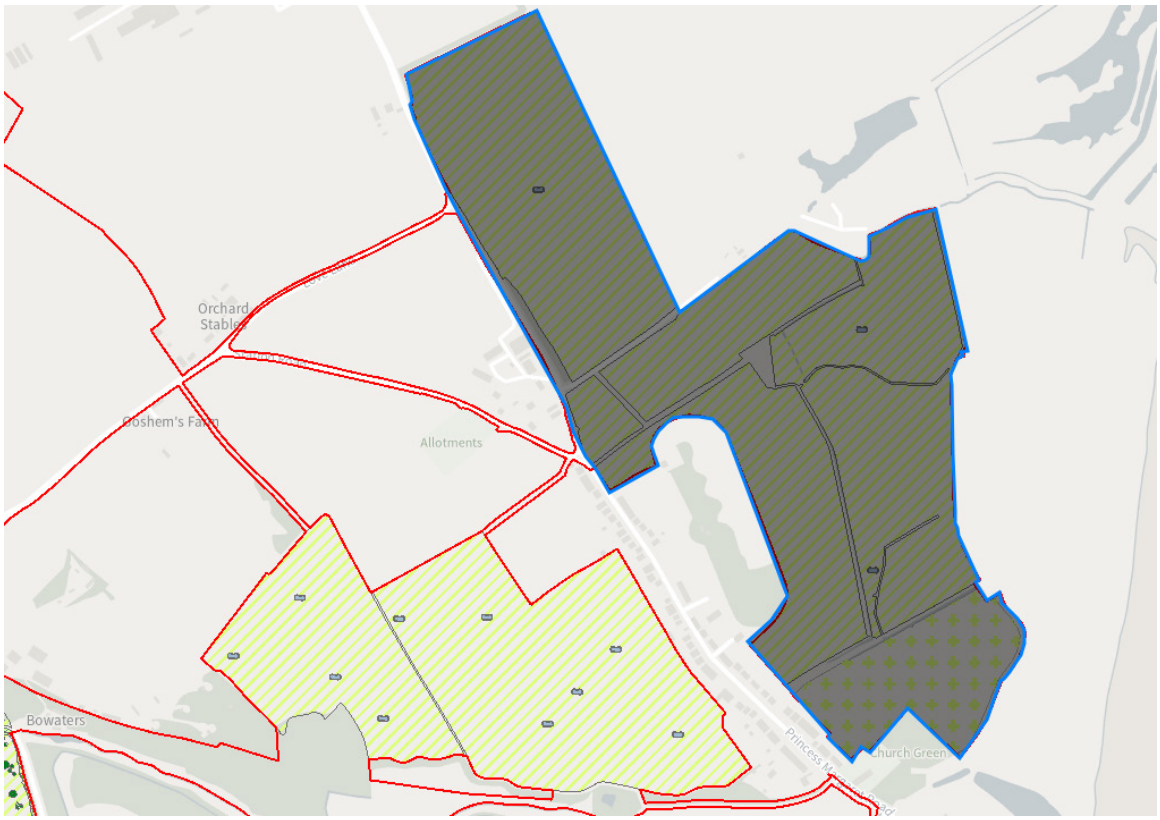


Plate 2 Area of acid grassland habitat creation north of Coalhouse Fort (shaded grey). The rest of the ecological mitigation area is proposed for open mosaic habitat creation.

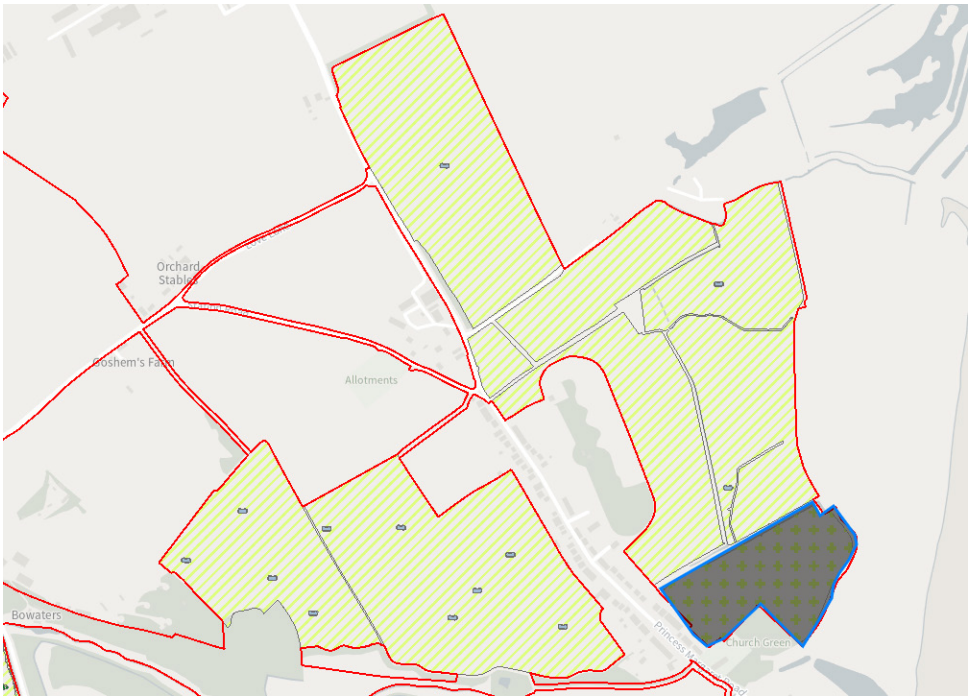
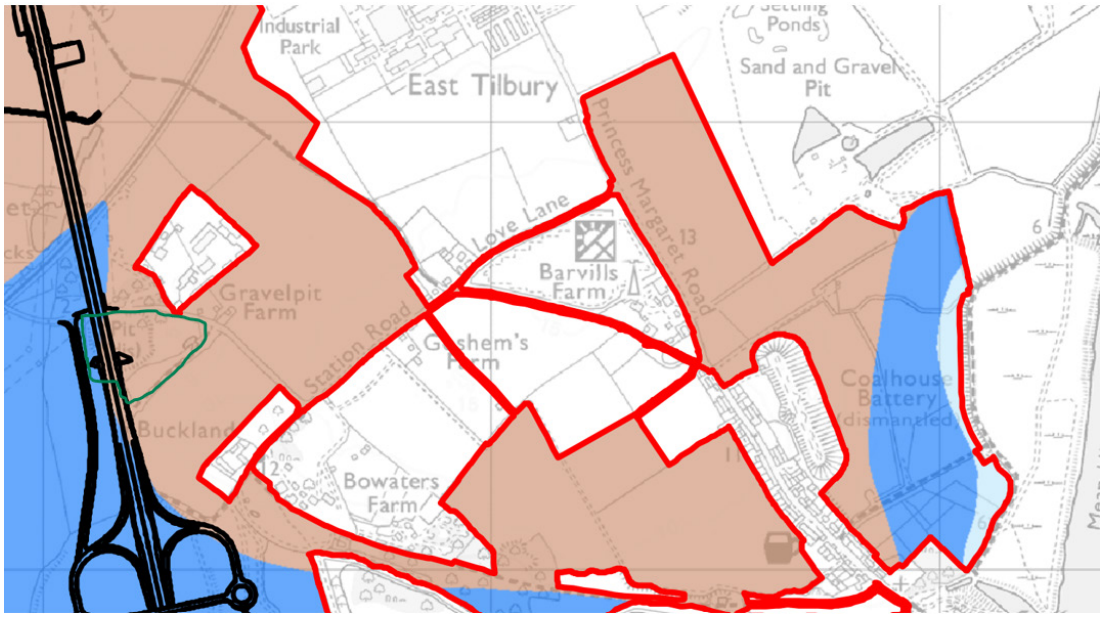
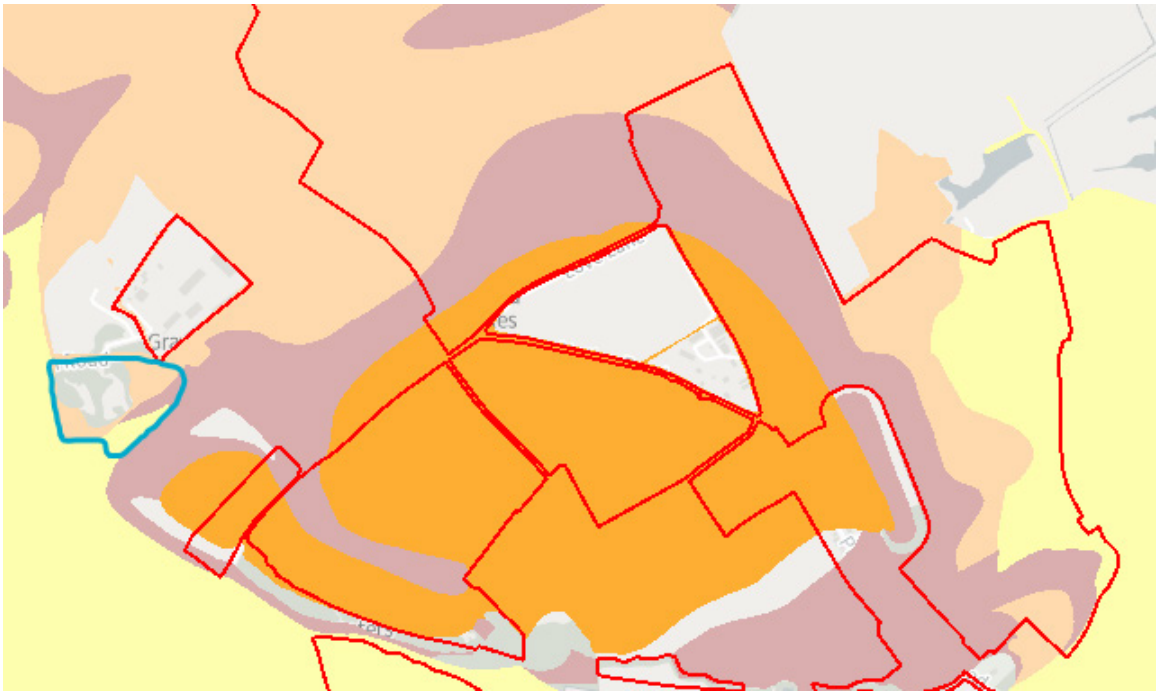


Plate 3 Soil scape mapping of ecological mitigation land north of Coalhouse Fort and Low Street Pit LWS to the west (boundary in blue).



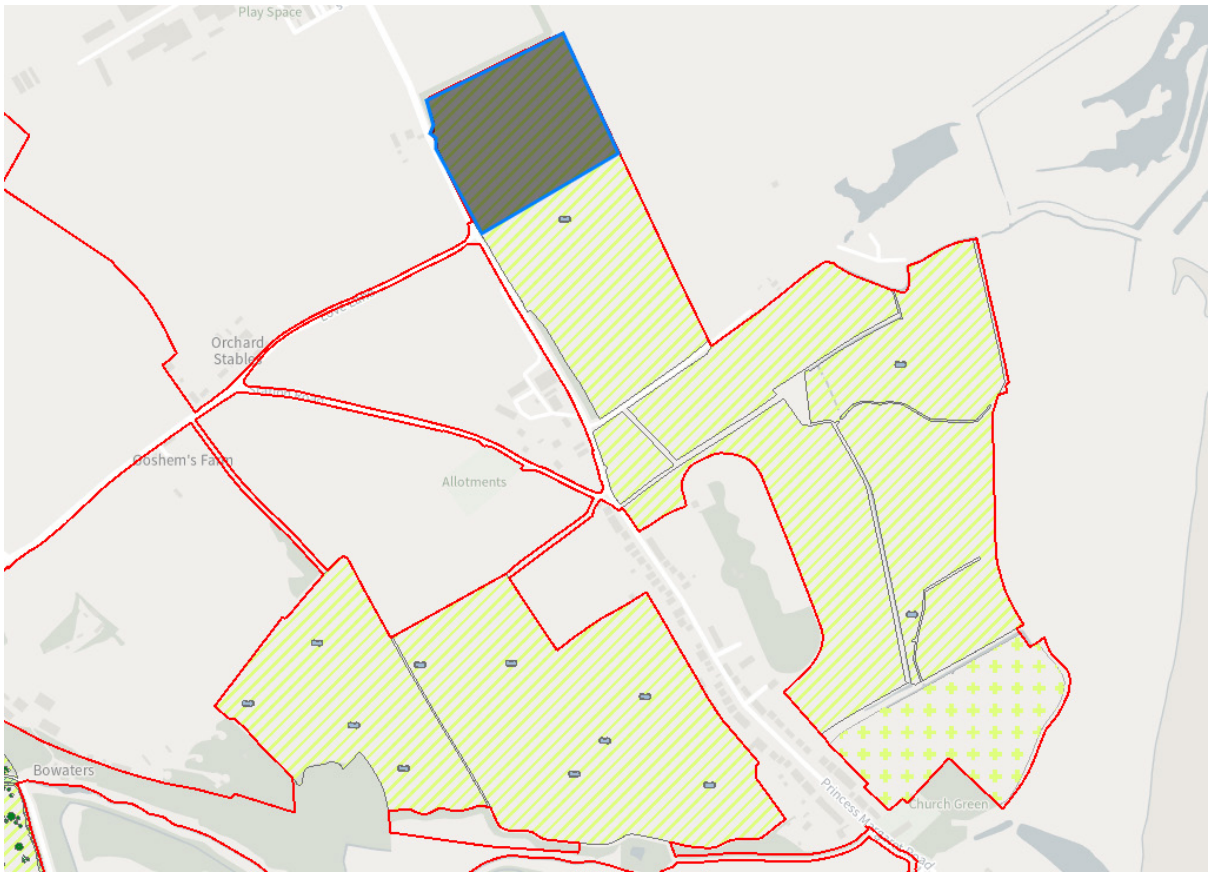
Pink: Free draining slightly acidic loamy soils.
Blue: Loamy and clayey soils of coastal flats with naturally high groundwater.
Light blue: Loamy and clayey floodplain soils with naturally high groundwater.

Plate 4 Superficial deposit mapping of ecological mitigation land north of Coalhouse Fort and Low Street Pit LWS to the west (boundary in blue).



Peach: Taplow gravel member – sand and gravel.
Purple: HEAD – clay, silt, sand and gravel.
Orange: Lynch Hill gravel member – sand and gravel.
Yellow: Alluvium – clay, silt, sand and peat

Plate 5 Proposed relocation of acid grassland creation within ecological mitigation area to align more closely to the underlying conditions within Low Street Pit LWS (position indicative within the north of the area)



Annex C.11 Aquatic Ecology: Macro-invertebrate data (summer 2022)

Lower Thames Crossing

Aquatic Ecology: Macro-invertebrate data (summer 2022).

Introduction

The Aquatic Ecology Technical Appendix 6.3 Environmental Statement - Appendix 8.4 - Freshwater Ecology [Application Document APP-393], submitted in support of the application for development consent for the Lower Thames Crossing (LTC) Project (North and South portals) provides an assessment of data collected in 2018 to spring 2022.

This technical note presents the macro-invertebrate data collected in summer 2022 and provides an assessment to previous data of the North and South portals and evaluation of the communities.

Macro-invertebrate taxa and associated abundances (summer 2022), alongside Water Framework Directive (WFD) metrics (2018-2022) are provided in this technical note. Full descriptions of WFD metrics, and previous macro-invertebrate taxa lists are provided in Appendix 8.4 - Freshwater Ecology.

LTC North Portal

Table 1 details the macro-invertebrate data collected for the LTC North portal. Site locations are presented in Appendix A. A full macro-invertebrate taxa list and associated abundances for summer 2022 data is presented in Appendix B.

Table 1 Macro-invertebrate sites for LTC North portal.

Site name	NGR	Summer 2018	Spring 2022	Summer 2022
W022N (same reach as JN3)	TQ 67969 76911	X		
W029N (same reach as JN1)	TQ 67274 76342	X		
W026N (similar location to JN2)	TQ 67694 76553	X		
JN1	TQ 67244 76208		X	X
JN2	TQ 67696 76551		X	X
JN3	TQ 68078 76865		X	X
JN4	TQ 66513 76489		X	Dry
JN5	TQ 66892 76481		X	X
JN6	TQ 67191 77129		X	X
JN7	TQ 66487 76940		X	X
JN8	TQ 67845 75825		X	X
JN9	TQ 68701 76893		X	X
JN10	TQ 68695 76478		X	X
JN11	TQ 68706 76697		X	X

In 2018 and 2022, the highest Salinity Association Group (SAG)[1] recorded was SAG III; taxa characteristic of brackish water, tolerant of a wide range of salinity conditions from long-term brackish to near freshwater. A summary of SAG III species (2018-2022) is provided in Table 2.

Macro-invertebrate samples collected in summer 2022 indicate slightly brackish conditions, with SAG scores ranging from 4.86 (oligohaline) to 10.33 (mesohaline) (Table 3). Summer SAG 2022 values fall within the range previously recorded (2018 - spring 2022: 5.00 - 10.00).

Table 2 SAG III species characteristic of brackish conditions identified in the North portal area.

Species	Summer 2018	Spring 2022	Summer 2022
Agabus conspersus (Beetle)	WO29	JN3	JN3
Berosus affinis (Beetle)	WO22N	JN3	JN2
Colymbetes fuscus (Beetle)		JN3	JN6
Corophium multisetosum (Amphipod)		JN8	JN8, JN11
Crangon crangon (Shrimp)			JN8
Enochrus bicolor (Beetle)	WO26N	JN3, JN10	JN10, JN11
Gammarus duebeni (Shrimp)	WO22N, WO29	JN1, JN3, JN4, JN5, JN9, JN10, JN11	JN1, JN3, JN5, JN9, JN10, JN11
Hygrotus parallelogrammus (Beetle)	WO26N		
Nereis diversicolor (Polychaete)		JN8	JN8
Noterus clavicornis (Beetle)	WO29	JN1	JN1
Notonecta viridis (Backswimmer)	WO26N		
Ochthebius marinus (Beetle)		JN3	
Sphaeroma rugicauda (Sea Slater)		JN8	
Palaemonidae (Prawn)	WO22N		JN10
Palaemonetes varians (Prawn)	WO22N	JN10	JN3, JN9, JN10
Rhantus frontalis (Beetle)	WO26N	JN1	JN3
Sigara selecta (Water boatman)		JN10	
Sigara stagnalis stagnalis (Water boatman)		JN10	

1 Pickwell, A. G. G. (2012). Development of a novel invertebrate indexing tool for the determination of salinity in aquatic inland drainage systems.

On-site observations at the time of sampling in summer 2022, and prior to this in 2018 and spring 2022, suggest a slow flowing, ditch like environment, with a prevalence of silt deposition. This was noted in the assessment of the macro-invertebrate data indicating slightly to heavily sedimented conditions (Proportion of Sediment-sensitive Invertebrates (PSI) metric[2]) and taxa with a preference for slower-flowing conditions (LIFE[3]) (Table 3).

In summer 2022, macro-invertebrate diversity (WHPT NTAXA[4]) varied from three scoring taxa at site JN8 to 11 at JN1, and communities composed predominantly of species more tolerant of poor water quality (WHPT ASPT[5]) (Table 3). This aligns with previously collected data.

Table 3 Macro-invertebrate metrics for North portal sites in summer 2022.

Site	Date	LIFE (sp)	LIFE (f)	CCI	PSI (sp)	PSI (f)	WHPT ASPT	WHPT NTAXA	WHPT	SAG
WO29N (same reach as JN1)	22/8/2018	5.67	6.17	21.00	16.67	35.71	4.22	9	38	7.6
JN1	5/4/2022	5.33	5.86	16.10	4.17	25.00	4.04	10	40.4	6.33
	7/6/2022	6.00	6.25	6.86	10.00	16.67	3.91	11	43.00	5.77
WO26N (same site as JN2)	22/8/2018	5.14	5.09	23.86	0.00	13.04	4.25	16	68	5.95
JN2	5/4/2022	5.20	6.00	1.80	0.00	27.27	4.54	8	36.3	5
	7/6/2022	5.40	5.50	21.00	0.00	13.33	4.39	9	39.50	5.38
WO22N (same reach as JN3)	22/8/2018	5.33	6.00	28.00	14.29	14.29	3.24	5	16.2	8.4
JN3	5/4/2022	5.43	6.33	27.00	7.14	40.00	5.13	10	51.3	6.83
	7/6/2022	5.33	6.17	26.00	7.14	15.38	3.88	8	31.0	6.20
JN4	5/4/2022	5.60	6.00	7.20	8.33	30.00	5.68	5	28.4	6.67
	7/6/2022	Dry								
JN5	5/4/2022	5.40	7.00	6.75	35.71	55.56	4.82	5	24.1	6.50
	7/6/2022	6.00	7.33	23.33	50.00	50.00	4.28	4	17.1	8.00
JN6	5/4/2022	5.60	6.00	6.00	0.00	11.11	4.18	6	25.1	4.67
	7/6/2022	5.83	6.00	4.00	0.00	11.11	4.90	7	34.3	5.33

2 Extence, C. A., Chadd, R.P., England, J., Dunbar, M. J., Wood, P. J. & Taylor, E. D. (2011). The Assessment of Fine Sediment Accumulation in Rivers Using Macro-invertebrate Community Response. River Research & Applications. doi:10.1002/rra.156929: pp17 - 55.

3 Extence, C.A., Balbi, D.M. and Chadd, R.P. (1999). River flow indexing using British benthic macroinvertebrates: A framework for setting hydroecological objectives. Regulated Rivers: Research and Management, 15, 543-574.

4 WFD-UKTAG. (2014). River Assessment Method Benthic Invertebrate Fauna Invertebrates (General Degradation): Whalley, Hawkes, Paisley and Trigg (WHPT) metric in River Invertebrate Classification Tool (RICT).

Site	Date	LIFE (sp)	LIFE (f)	CCI	PSI (sp)	PSI (f)	WHPT ASPT	WHPT NTAXA	WHPT	SAG
JN7	5/4/2022	5.83	6.00	5.00	0.00	9.09	4.24	7	29.7	4.80
	7/6/2022	5.17	5.40	4.50	0.00	8.33	3.67	6	22.0	4.86
JN8	5/4/2022	N/A	7.00	2.00	0.00	0.00	4.70	2	9.4	10.00
	7/6/2022	N/A	6.50	7.00	0.00	0.00	4.50	3	13.5	10.33
JN9	5/4/2022	7.00	6.67	12.00	57.14	100	3.95	4	15.8	8.00
	7/6/2022	6.67	7.33	6.00	66.67	100.00	3.98	4	15.9	8.66
JN10	5/4/2022	5.40	5.60	32.20	11.76	40.00	5.00	6	30	8.13
	7/6/2022	5.60	5.60	26.60	11.11	22.22	4.42	6	26.5	8.50
JN11	5/4/2022	7.00	6.25	12.00	16.67	50.00	3.45	6	20.7	7.50
	7/6/2022	6.33	6.50	30.33	22.22	25.00	4.48	6	26.9	9.00

The Community Conservation Index (CCI)[5] metric provides an indication of the conservation value of the macro-invertebrate community. In summer 2022, communities at sites JN2, JN3, JN5, JN10 and JN11 had a very high conservation value, with CCI scores >20 (Table 3). At sites JN2, JN3, JN10 and JN11, this is due to the presence of notable beetle species: *Agabus conspersus, Berosus affinis, Enochrus bicolor* and *Rhantus frontalis* (Table 4). The macro-invertebrate community at site JN5 is also noted as having a high conservation value, but this is due to a greater abundance of lower scoring conservation species, rather than the presence of one or two notable (or greater) species.

Table 4 Macro-invertebrate species of conservation interest (CCI>7); all beetles.

Species	CCI value	2018	Spring 2022	Summer 2022	Foster (2010)[6]
Agabus conspersus	7 Notable	WO29N	JN3	JN3	Nationally Scarce
Berosus affinis	7 Notable	WO22N	JN3	JN2	
Enochrus bicolor	7 Notable	WO26N	JN3, JN10	JN10, JN11	Nationally Scarce
Enochrus halophilus	7 Notable	WO26N			Nationally Scarce
Hygrotus parallelogrammus	7 Notable	WO26N			Nationally Scarce
Hygrotus quinquelineatus	7 Notable	WO26N			Nationally Scarce
Ochthebius marinus	7 Notable		JN3		
Rhantus frontalis	7 Notable	WO26N	JN1	JN3	Nationally Scarce

5 Chadd, R. and Extence, C. (2004). The conservation of freshwater macroinvertebrate populations: a community-based classification scheme. Aquatic Conservation: Marine and Freshwater Ecosystems, 14, 597-624.

6 Foster, G. (2010). A review of the scarce and threatened. Joint Nature Conservation Committee.

LTC South

Table 5 details the macro-invertebrate data collected for the LTC South portal. Site locations are presented in Appendix A. The sampling in 2018 was located in the Filborough Marshes, further east of the sites in 2021-2022. Due to the different location, these sites have not been included for comparison within this technical note. A full macro-invertebrate taxa list and associated abundances for summer 2022 data is presented in Appendix B.

Table 5 Macro-invertebrate sites for LTC South portal.

Site name	NGR	Summer 2018	Spring 2022	Summer 2022
J1	TQ 67627 73776	X		
J2	TQ 67750 73444	X		
J3	TQ 67945 73689	X		
J4	TQ 68152 73642	X		
J5	TQ 68013 73391	X		
MP1	TQ 67292 73855		X	X
MP2	TQ 67336 73747		X	X
MP3	TQ 67259 73630		X	X
MP4	TQ 67211 73431		X	X

The macro-invertebrate communities located in the South portal sampling area are indicative of brackish environments. A number of SAG[7] species were recorded, of which SAG III was the highest/most tolerant of brackish conditions recorded. A summary of SAG III species is provided in Table 6. These are taxa characteristic of brackish water, tolerant of a wide range of salinity conditions from long-term brackish to near freshwater. Similar brackish species and SAG scores were identified in the South portal area in autumn 2021 and spring 2022 (Table 7).

Table 6 SAG III species characteristic of brackish conditions identified in the South portal area.

Species	Autumn 2021	Summer 2022
Aeshna mixta (Dragonfly)		MP1
Agabus conspersus (Beetle)	MP1	
Berosus affinis (Beetle)		MP1, MP3, MP4
Colymbetes fuscus (Beetle)	MP1	
Helophorus minutus (Beetle)		MP1, MP3
Noterus clavicornis (Beetle)	MP1	
Rhantus frontalis (Beetle)	MP1	
Sigara stagnalis stagnalis (Water boatman)	MP2	MP1

7 Pickwell, A. G. G. (2012). Development of a novel invertebrate indexing tool for the determination of salinity in aquatic inland drainage systems.

In summer 2022, macro-invertebrate diversity (WHPT NTAXA[8]) ranged from nine species at MP2 to 24 species at MP3. WHPT ASPT scores were relatively low, with the highest recorded at 3.81. This suggests a community more tolerant of poor water quality. PSI (sp) scores[9] were all zero, indicating a heavily sedimented environment. The slow-flowing ditch-like habitat with a prevalence of silt deposition observed on-site was reflected in the macro-invertebrate community data.

In comparison to 2021/spring 2022 data, summer 2022 macro-invertebrate communities exhibited similar community composition and habitat conditions.

Table 7 Macro-invertebrate metrics for South portal sites (2021-2022).

Site	Date	LIFE (sp)	LIFE (f)	CCI	PSI (sp)	PSI (f)	WHPT ASPT	WHPT NTAXA	WHPT	SAG
MP1	24/11/2021	5.67	5.21	15.11	0	5.88	3.41	18	61.3	6.17
	8/3/2022	5.82	6.10	5.00	0	15.79	3.53	13	45.9	5.09
	5/7/2022	5.42	5.82	17.79	0	7.50	3.81	18	68.6	5.60
MP2	24/11/2021	5.75	5.91	12.5	0	16.67	3.62	12	43.4	5.31
	8/3/2022	5.80	5.89	6.00	0	17.65	3.42	11	37.6	5.10
	5/7/2022	5.86	5.88	16.25	0	0.00	3.30	9	29.7	5.40
MP3	24/11/2021	5.43	6.00	3.50	0	16.67	3.66	16	58.6	5.33
	8/3/2022	5.75	6.25	3.86	0	25	3.76	10	37.6	4.89
	5/7/2022	5.61	5.84	16.00	0	7.50	3.78	24	90.80	5.32
MP4	24/11/2021	5.92	5.92	5.18	0	12	3.43	16	54.8	5.29
	8/3/2022	5.82	5.94	4.93	0	10.81	3.77	19	71.6	5.05
	5/7/2022	5.64	5.56	13.36	0	9.68	3.47	19	66.00	5.50

The macro-invertebrate communities of the South portal area in summer 2022 are considered fairly high to high conservation value[10]. One species of notable conservation interest was identified in the summer 2022 data, which has not been identified previously: the beetle *Berosus affinis*. Although of notable value, it is not classed as Nationally Scarce. The two-beetles identified in autumn 2021 were Nationally Scarce: *A.conspursus* and *R. frontalis* (Table 8).

8 WFD-UKTAG. (2014). River Assessment Method Benthic Invertebrate Fauna Invertebrates (General Degradation): Whalley, Hawkes, Paisley and Trigg (WHPT) metric in River Invertebrate Classification Tool (RICT).

9 Extence, C. A., Chadd, R.P., England, J., Dunbar, M. J., Wood, P. J. & Taylor, E. D. (2011). The Assessment of Fine Sediment Accumulation in Rivers Using Macro-invertebrate Community Response. River Research & Applications. doi:10.1002/rra.156929: pp17 - 55.

10 Chadd, R. and Extence, C. (2004). The conservation of freshwater macroinvertebrate populations: a community-based classification scheme. Aquatic Conservation: Marine and Freshwater Ecosystems, 14, 597-624.

Table 8 Macro-invertebrate species of conservation interest (CCI>7). No species identified in spring 2022.

Species	CCI value	Autumn 2021	Summer 2022	Foster (2010)[11]
Agabus conspersus (Beetle)	7 Notable	MP1		Nationally Scarce
Berosus affinis (Beetle)	7 Notable		MP1, MP3, MP4	
Rhantus frontalis (Beetle)	7 Notable	MP1		Nationally Scarce

Evaluation

The North and South portal areas have aquatic environments which are slow-flowing, sedimented, typically ditch-like habitats with evidence of saline intrusion.

A number of species of conservation interest were identified in the 2018 and 2022 surveys in the North portal area. These were all species of beetle, afforded notable value (CCI 7). All except one species recorded (*H. quinquelineatus*) are associated with brackish conditions. The beetles *A. conspersus*, *E. bicolor*, *E. halophilus*, *H. parallelogrammus*, *H. quinquelineatus* and *R. frontalis* are all considered Nationally Scarce, but may be found in suitable habitat across the south-east of England.

In the South portal area, three species of conservation interest were recorded, two of which are Nationally Scarce but known within the wider south-east England area; *A. conspersus* and *R. frontalis*.

Macro-invertebrate communities across the North and South Portal area, with the addition of summer 2022 data continue to be given a County value of importance. The addition of the summer 2022 data does not change the importance or significance of data reported in 6.3 Environmental Statement - Appendix 8.4 - Freshwater Ecology [Application Document APP-393], which then supports the assessment reported in 6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity [Application Document APP-146].

11 Foster, G. (2010). A review of the scarce and threatened. Joint Nature Conservation Committee.

Appendix A

Figure 1: North portal macro-invertebrate site locations

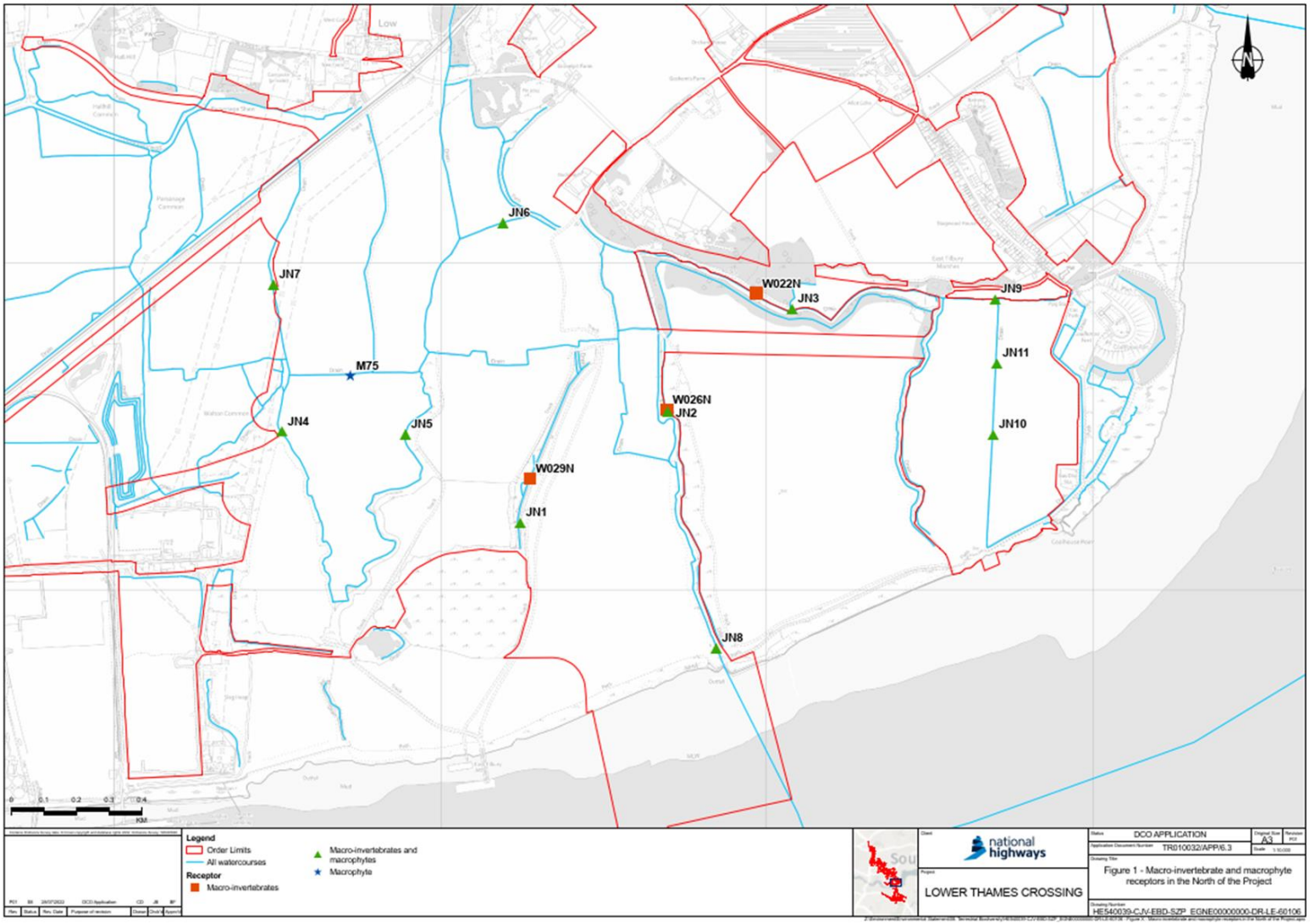
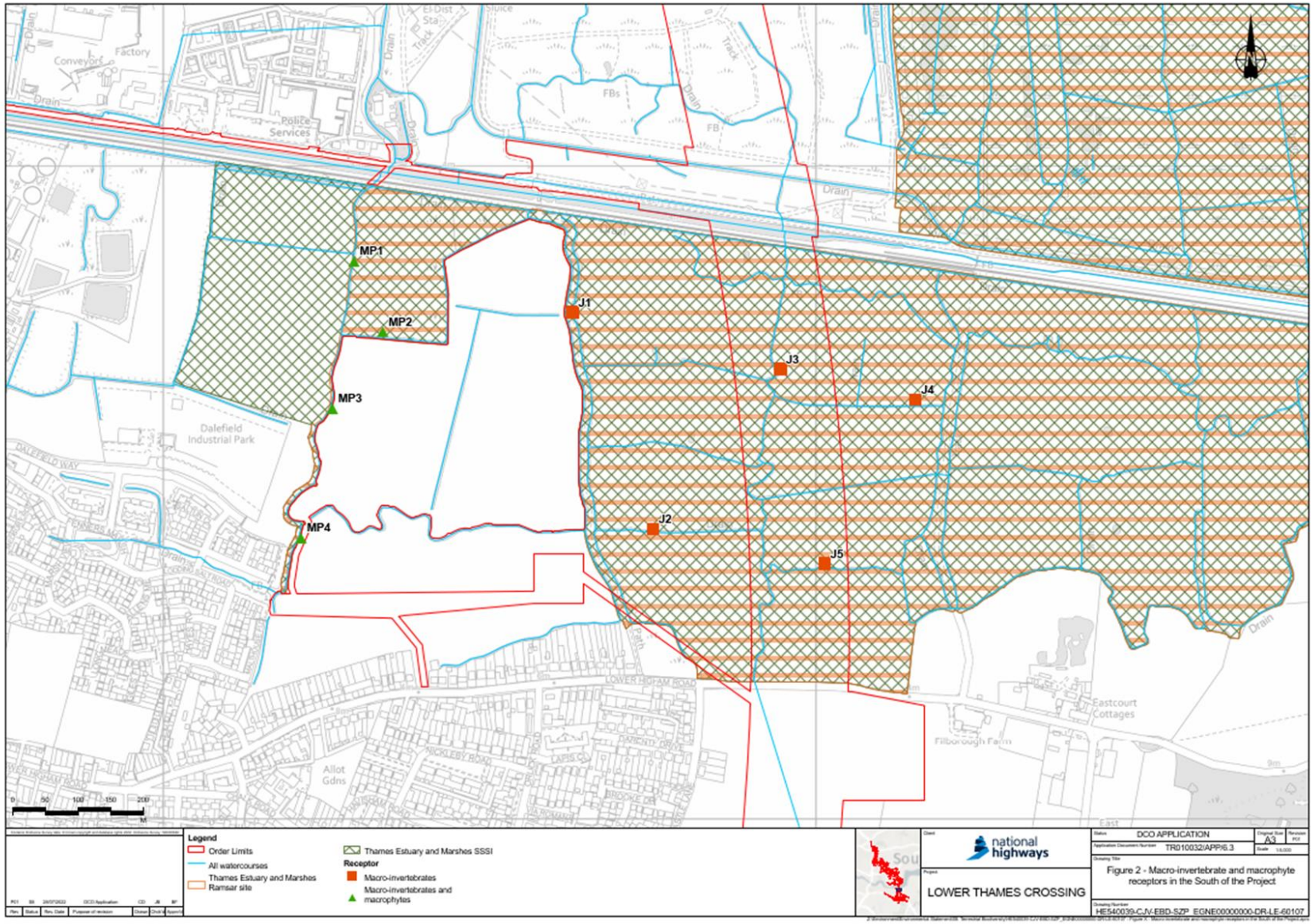


Figure 2: South portal macro-invertebrate site locations



Appendix B

Table 1: North portal macro-invertebrate data, summer 2022.

	JN1	JN2	JN3	JN5	JN6	JN7	JN8	JN9	JN10	JN11
Agabus bipustulatus					1					
Agabus conspersus			1							
Agabus sp.		10	1							
Anacaena bipustulata				1						
Anacaena globulus					1	1				
Anacaena limbata					1					
ASELLIDAE						2				
Asellus aquaticus						6				
BAETIDAE		2								
Berosus affinis		3								
Cerastoderma edule										3
CERATOPOGONIDAE	1	2								
Chalcolestes viridis		10								
Chironomidae	245	333	104	93	63	96		51	16	55
Cloeon dipterum		2								
COENAGRIONIDAE	1		5							
Colymbetes fuscus					1					
CORIXINAE		90	121						2	
Corophium multisetosum							574			11
Crangon crangon							15			
CURCULIONIDAE				1						
Cymbiodyta marginella				1						
Diptera			1						2	
DIXIDAE					1					
DYTISCIDAE		14								
Enochrus bicolor									18	1
GAMMARIDAE			3						1	
Gammarus duebeni	3		9	192				126	9	26

	JN1	JN2	JN3	JN5	JN6	JN7	JN8	JN9	JN10	JN11
Gammarus sp.				6				2		
Gastropoda				4		1				
Gyrinus sp.		29			1					
Haliplus lineatocollis	1									
Helius sp.				1						
Helophorus brevipalpis		2	12							
Helophorus grandis									1	
Helophorus sp.		1	1	3						
Hydracarina		1								
Hydrobia ulvae							1			
Hydrobia ventrosa							4			
Hydrobius fuscipes						4				
HYDROPHILIDAE	1		1	3	3				1	11
Hydroporus planus						1				
Hydroporus sp.		1								
Hygrotus inaequalis	1									
Ilybius/Agabus		3								
Ischnura elegans			2							
Laccobius bipunctatus	1									
Limnephilus lunatus								1		
LYMNAEIDAE						1				
Nereis diversicolor							37			
Noterus clavicornis	7									
Notonecta sp.		17	1							
Oligochaeta			2				7		2	66
Orchestia cavimana									1	
Palaemonetes varians			3					25	33	
PALAEMONIDAE									4	
Plea leachi	1									
Polydora cornuta										32
Potamopyrgus antipodarum								8	965	82

	JN1	JN2	JN3	JN5	JN6	JN7	JN8	JN9	JN10	JN11
Proasellus meridianus					5	24				
Radix balthica	4				3	175				
Rhantus frontalis			2							
Rhantus sp.					1					
SCIRTIDAE	1					5				
Sialis lutaria		2								
Sigara lateralis		11								
Sigara scotti			10							
Tubificoides pseudogaster agg.										2
Zygoptera Gen. sp.		1								

Table 2: South portal macro-invertebrate data, summer 2022.

	MP1	MP2	MP3	MP4
Aeshna mixta	2			
Agabus sp.			2	
Anacaena bipustulata		1		
ASELLIDAE		3	3	
Asellus aquaticus	210	119	124	188
BAETIDAE	2			
Berosus affinis	2		2	1
Berosus sp.			1	
Caenis robusta			1	
CERATOPOGONIDAE			2	3
Chironomidae	254	645	75	175
Cloeon dipterum	41		24	2
COENAGRIONIDAE			2	1
Corixa panzeri	26			
Corixa sp.	3			
CORIXIDAE	11		14	
CORIXINAE		6		89
Crangonyx pseudogracilis/floridanus	87		6	4
CULICIDAE			1	

	MP1	MP2	MP3	MP4
CURCULIONIDAE				1
Cymbiodyta marginella	2			
Dugesia lugubris/polychroa			3	
DYTISCIDAE	4		1	
Dytiscus sp.			1	
GLOSSIPHONIIDAE	1			3
Gyraulus crista			4	51
Haliplus lineatocollis	1			
Haliplus ruficollis	1			
Haliplus ruficollis group	2			
Haliplus sp.	1		1	2
Helobdella stagnalis	46		54	6
Helochares lividus	13			
Helochares sp.			1	
Helophorus brevipalpis	1			
Helophorus minutus	8		4	
Helophorus sp.	17	1	4	
Hesperocorixa linnaei	35	1		
Hydracarina		1	1	1
Hydrobius fuscipes	1			
HYDROPHILIDAE	9		1	
Hygrotus inaequalis	2			
Hygrotus sp.	1			
Hyphydrus ovatus	1			
Ilyocoris cimicoides cimicoides	3		1	
Laccophilus sp.	7			
Limnephilus lunatus				1
Musculium lacustre		2		
Notonecta glauca	4			
Notonecta sp.	4	1		3
Oligochaeta			13	2
Oribati			1	
Physella sp.	3	10	3	2
Planorbarius corneus	1			3
Planorbis carinatus				1

	MP1	MP2	MP3	MP4
Polycelis sp.			2	
Potamopyrgus antipodarum		6	4	160
Proasellus meridianus			3	
Ptychoptera sp.	3	1		
Radix balthica	13		5	85
Sialis lutaria	3		3	2
Sigara dorsalis				4
Sigara dorsalis/striata		1	11	24
Sigara falleni			2	
Sigara lateralis	5			
Sigara stagnalis stagnalis	3			
SPHAERIIDAE	4	2	35	11
STRATIOMYIIDAE			1	
Theromyzon tessulatum	6		1	

Annex C.12 Response to Natural England advice on air quality impacts on European Sites

Lower Thames Crossing

Technical Note Response to Natural England advice on air quality impacts on European Sites

Date issued: 30 June 2023

Introduction

Natural England (NE) have provided advice on the assessment of air quality impacts on European sites which are recorded in the Statement of Common Ground (SoCG [APP-099] and included in Annex A of this note), the Relevant Representation dated 24 February 2023 and a note summarising the air quality advice received by email on 11 April 2023. The relevant commentary from each of these documents is included in Annex A for completeness.

This technical note has reviewed the Natural England SoCG, Relevant Representation and "*Summary of advice received on National Highways Air Quality assessment"* and provides a response to the following key issues that are considered to remain "under discussion" with regard to the assessment of air quality within the LTC Habitats Regulations Assessment (HRA) [APP-487].

1. How National Highways has identified and considered other plans and projects acting in combination (i.e. risk of proliferation of imperceptible changes adding up to become a significant impact). - NE recommend that National Highways follows the methodology outlined in Natural England guidance NEA001 which takes into account the Wealden decision in terms of in-combination assessment
2. Imperceptible modelled NOx and its application to NH_3 and N deposition – NE recommended that NOx, ammonia and nitrogen deposition are calculated separately for each protected site, and compared against the relevant critical levels and critical load.

It should be noted that the SOCG issues 2.1.88 & 2.1.91 regarding the conclusion of no Likely Significant Effect (LSE) for North Downs Woodland (NDW) SAC and the use of inconsequential NOx is by virtue of NEs recommendation included within the "imperceptible impacts" issue listed in the most recent advice from NE.

In-combination traffic assessment

The Project's transport model (the Lower Thames Area Model (LTAM)) covers the whole of England, Scotland and Wales in order to capture the start and end of every trip, but more comprehensively so in Dartford, Medway, Kent, Thurrock, Essex and east London. In these areas, the road network is represented in great detail. The LTAM was developed using DfT's Transport Appraisal Guidance (TAG). As set out in Chapter 4 of the National Policy Statement for National Networks[1] (paragraph 4.6 in particular), the "national methodology and national assumptions around the key drivers of transport demand" do not need to concern the Examining Authority or Secretary of State.

The method for producing the future year matrices is set out in Section 6.3 of 7.7 Combined Modelling and Appraisal Report [APP-518]. The traffic growth factors were taken from the DfT's national Transport Model which uses forecasts of population growth at a local level prepared by the Office of National Statistics and other factors relevant to the number of car trips made, such as the structure of the population and the number of people holding car driving licenses. Given the

1 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf

large geographical extent of the LTAM, this approach does produce an 'in-combination' assessment of the growth in traffic and a fair representation of the areas of the road network that will exceed the 1,000 AADT level of change in vehicles as a result of the Project. For this reason we are comfortable that the issues raised in the Wealden decision do not present in the LTAM model and in-combination traffic is considered.

Where greater spatial definition is provided as to the precise location of new developments and their associated trips, the LTAM takes regard of the proposed build out of the development, and includes the appropriate number of trips for each of the forecast years. The list of developments and other road schemes that reach the TAG criteria (as set out in Table A2 of Appendix A in Unit M4[2]) of having a sufficient degree of certainty for inclusion in a transport model are listed in Annex A of 7.7 Combined Modelling and Appraisal Report - Appendix C - Transport Forecasting Package Annexes [APP-523].

For a model of say, traffic in 2030 then a development which does not start until 2031 is not explicitly included in the model. If the model year was 2031 then some of that development would be included and the total level of traffic growth in the model would be that of the DfT traffic growth forecasts for 2031. The LTAM traffic model is reported for the opening year (2030) and the design year (2045). The design year has been used to provide the duration of impacts across the designated sites. Individual developments which meet the TAG criteria detailed above have been considered between 2030 and 2045 and therefore contribute to the assessed duration of impact. Where developments are outside of the TAG criteria the local growth factors within the model are designed to pick up forecast growth. Therefore we do not agree that the examples provided are not considered within the application.

The non-road based contributions to nitrogen deposition are already considered within the LTC Habitats Regulations Assessment (HRA) [APP-487] at paragraphs 6.2.122-6.2.125 for Thames Estuary and Marshes Ramsar site, paragraphs 6.2.137-6.2.138 for North Downs Woodland SAC and paragraphs 7.2.58-7.2.62 for Epping Forest SAC.

Consideration of NOx, NH_3 and nitrogen deposition for each protected site

We are undertaking a without-prejudice assessment of NOx and NH_3 as individual pollutants on all European sites within 200m of the ARN, namely Epping Forest SAC, North Downs Woodlands SAC and the Thames Estuary and Marshes SPA/Ramsar. We maintain our position within the DCO application that these pollutants do not require assessment as they are not included in the National Highways guidance that has been followed in undertaking our assessment. However, in due regard to Natural England's advice, we are assessing the pollutants and will undertake a without-prejudice HRA screening or appropriate assessment of the impact pathway, dependent on the modelling results.

The methodology to be used (to look at Critical Levels) will follow the same principles as already applied in considering the changes in nitrogen deposition against the relevant Lower Critical Loads (LCL). At screening stage for each European site within 200m of the ARN we propose to consider the DS concentrations against the relevant Critical Level (CL) and if that threshold is exceeded, we will then consider the DS-DM change in concentration against the 1% CL threshold. If that threshold is exceeded the assessment will proceed to stage 2 appropriate assessment. If the DS-DM 1 % threshold is not exceeded then no LSE will be concluded for the project alone and the predicted change then considered, at stage 1 screening, in-combination with other plans and projects using the same 1%CL thresholds to conclude no LSE in combination.

We will also undertake a without-prejudice assessment of nitrogen deposition regardless of the change in NOx (the inconsequential NOx threshold) for all European sites within 200m of the ARN, namely Epping Forest SAC, North Downs Woodlands SAC and the Thames Estuary and Marshes SPA/Ramsar. We maintain our position within the DCO application that such imperceptible levels

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2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1161977/tag-unit-m4-forecasting-and-uncertainty.pdf

should not be used to generate nitrogen deposition values as they are considered to be beyond the ability of monitors and models to robustly measure / model this level of change. However, in due regard to Natural England's advice, we are modelling the nitrogen deposition values and will undertake a without-prejudice appropriate assessment of the impact pathway where the modelling shows an exceedance of the screening thresholds (DS deposition exceeds the relevant LCL and the DS-DM change exceeds 1% of the LCL).

The expectation for the without-prejudice screening and/or appropriate assessment is that it will conclude that there would be no likely significant effects or adverse effects on integrity on any sites. A conclusion of no adverse effects on integrity would demonstrate that there would be no material change to the assessment as submitted in the application for a DCO. Whether the conclusion of the HRA for this impact on this site were to conclude no likely significant effects or no adverse effects on integrity would make no change to whether the HRA would be a barrier to consent.

North Down Woodlands SAC

As set out above we are undertaking a without-prejudice assessment of nitrogen deposition effects on North Downs Woodlands SAC irrespective of the fact that the modelled NOx levels are imperceptible. It should be noted that any nitrogen deposition exceedance would only occur up to 30m into the site, as the site boundary is 170m from the affected road network.

We have also undertaken a more detailed botanical survey of the area of North Downs Woodlands SAC within 200m of the ARN to support the without-prejudice assessment. The survey found that the habitat within the area 200m from the ARN is not a designated habitat feature, being an ash woodland and not the beech or yew woodlands for which the SAC is designated. Additionally, no nitrogen-sensitive species were recorded in the survey.

The expectation for the without-prejudice assessment is that it will conclude that there would be no adverse effects on integrity due to an extremely small proportion of the site being theoretically affected; that is not a designated feature; and has no nitrogen-sensitive species present.

A conclusion of no adverse effects on integrity would demonstrate that there would be no material change to the assessment as submitted in the application for a DCO. Whether the conclusion of the HRA for this impact on this site were to conclude no likely significant effects or no adverse effects on integrity would make no change to whether the HRA would be a barrier to consent.

Next Steps

We will write a technical note on the results of the without-prejudice assessment and what changes would be required if it were to be necessary to change the HRA in light of the without-prejudice assessment. The technical note will be shared with Natural England as soon as possible and then submitted to the Examination at Deadline 2 as supporting information to the Comments on Written Representations required at that deadline.

Annex A - Natural England advice

SoCG (APP-099)

SoCG 2.1.88 – Natural England is in agreement with the HRA screening conclusions, apart from items 2.1.89 on underwater noise and 2.1.91 relating to North Downs Woodland Special Area of Conservation (SAC). Natural England is continuing to hold constructive discussions with National Highways on these matters.

SoCG 2.1.90 - Natural England is seeking confirmation that the LTC traffic model builds in the same data for in-combination development as Local Authorities use for their Local Plan allocation planning. Subject to written confirmation that this additional traffic is accounted for through growth factors, Natural England would agree this conclusion.

SoCG 2.1.91 - Natural England is seeking clarification from specialists on the use of inconsequential nitrogen oxide (NOx) in the methodology for modelling Nitrogen deposition. Natural England is, however, confident that agreement on this matter can be achieved within Examination timeframes.

Relevant Representation

NE02 (SoCG ref 2.1.88 & 2.1.91) - Natural England is seeking further evidence concerning predicted air pollution impact and is yet to provide its final advice on whether there will be 'no likely significant effect' on the North Downs Woodlands SAC. We have commissioned additional work on the application of the Habitats Regulations to the matter of 'inconsequential NOx'. We have received initial advice from our contractor which is under review by our specialists pending any further advice to this project. Our concern is that National Highways has not considered Nitrogen deposition (or ammonia) as pollutants in their own right, because the increase in NOx is less than 0.3µg/m^3. Natural England does not consider that this is compliant with case law.

NE03 (SoCG ref 2.1.90) - Natural England is seeking confirmation that the Lower Thames Crossing traffic model builds in the same data for in- combination development as Local Authorities use for their Local Plan allocations and that it includes consented and unconsented allocations. This concern relates to the general traffic and air quality modelling work, and therefore applies to a range of ecological receptors sensitive to air quality impacts, rather than one specific receptor. Natural England has yet to receive adequate assurances that all allocated development (including those with and without planning permission) within Local Plans which will generate a volume of traffic has been appropriately accounted for in the calculations informing the ES / HRA assessments. Progress on this issue appears to be hindered by the methodology being unable to expressly confirm the traffic figures in a translatable manner which can be used with confidence for HRA in-combination purposes (i.e. comparing growth factors with traffic numbers). Thus Natural England is not yet confident that the Project can demonstrate that it has fully taken account of Local Plans within the in-combination test.

Summary of advice received on National Highways Air Quality assessment.

Two issues have been highlighted to Natural England in the methodology used in National Highways' approach to the assessment of potential effects from road schemes upon designated nature conservation sites. These issues mean that Natural England is currently unable to support the approach adopted, as it is not compliant with case law.

These are:

- How National Highways has identified and considered **other plans and projects** acting in combination (i.e. risk of proliferation of imperceptible changes adding up to become a significant impact).
- How "**imperceptible impacts**" from ammonia (NH_3) and nitrogen deposition (Ndep) are derived from NOx modelling.

Consideration of other plans and projects

The approach to identifying whether a road requires further assessment is based on the difference between the "do something" traffic model (i.e. with the scheme) compared to the "do minimum" forecast traffic (without the scheme) in the opening year of the scheme. The "1000AADT" criteria (or other criteria relating to HDV AADT, speed banding or road alignment) is applied, and only then is the 1% threshold (of the relevant ecological end point – in this case the critical level for annual NOx) applied. Therefore, if the 1000AADT criteria is not met (in the opening year) – no further ecological consideration is made.

The UK Courts have specifically considered (in the case of Wealden DC concerning the impacts of traffic associated with increased housing development[3]) the line of reasoning that the contribution from a proposal can properly be ignored on the basis of its magnitude (i.e. if the 1000AADT criteria is not met by the road alone, no further ecological consideration is required) and in such a case no further assessment in-combination with other plans and projects is necessary.

The court found that the use of the 1000AADT threshold 'alone' brought about a clear breach of the Habitats Regulations in that several schemes with <1000 AADT may need to be considered together. This applies even though <1000 AADT (or the 1% threshold, for which the 1000AADT threshold is a rough approximation) may correctly be considered trivial/ inconsequential.

Therefore, although the approach in DMRB carries out a limited in-combination assessment (as the predicted opening year traffic flows takes account of some anticipated future growth) it appears that predicted increases in traffic flows which might arise from some other plans and projects are excluded where these occur after the opening year. For example:

- Traffic-generating proposals which are in the pipeline but not 'operational' on the opening year – for example, a large traffic-generating project predicted to be operational in 2025 would not be included in a DMRB in-combination assessment for a road predicted to open in 2024. This would mean emissions from this project would not be addressed in the assessment which would underestimate "committed" in-combination emissions to a protected site;
- Traffic-generating proposals for which applications have been submitted but which are not yet consented or e.g. allocations in local plans; and
- Contributions from non-road-based emissions from other plans and projects.

Therefore, the 1000AADT (and the 1%) threshold does not appear to be applied to the scheme in a manner which takes account of other plans and projects in a robust manner.

Natural England has been advised that this approach is vulnerable to challenge for failing to properly consider other projects in combination.

[3] Wealden DC v SoS and Lewes DC and South Downs National Park Authority [2017] EWHC 351 (Admin)

Imperceptible modelled NOx and its application to NH_3 and N deposition

National Highways considers that changes below 1% of an air quality threshold can be regarded as imperceptible or inconsequential. Changes above 1% of an air quality threshold are considered further. Therefore, in the case of NOx concentrations (i.e. using the NOx critical level of 30µg/m^3 - the concentration of NOx in the atmosphere, above which direct adverse effects on plants or habitats may occur, according to present knowledge[4]) modelled changes of greater than 0.3µg/m^3 are subject to further consideration.

The methodology National Highways uses for calculating other pollutants – in this case ammonia (NH_3) concentrations and nitrogen deposition (Ndep) – are dependent on NOx concentrations. However, these pollutants will only be routinely calculated if modelled changes in NOx concentrations are greater than 0.3µg/m^3.

This approach can lead to a situation where the 1% threshold of the critical level for ammonia concentrations or the critical load for Ndep can be exceeded, but concentrations of these pollutants have not been calculated, as NOx concentration is <0.3µg/m^3. In this circumstance, the assumption that changes above 1% of the relevant threshold are considered further is not applied in practice to ammonia and Ndep.

As an example, Table 1 overleaf shows that converting 1% of the critical load for NOx (0.3µg/m^3) to ammonia and Ndep, results in concentrations for those pollutants that reach or exceed 1% of their respective critical level (for ammonia) or critical load for Ndep. For example, the critical load for a heathland habitat or broadleaved woodland[5] is 10-20kgN/ha/yr (some habitats such as bogs have even lower critical loads - e.g. 5-10kgN/ha/yr) and when the 0.3µg/m^3 threshold of NOx is reached, the associated Ndep would be at 2% or 3% of the critical load for moorland/ woodland habitat types respectively, and the ammonia concentration would be at up to 3% of its relevant critical level. On this basis, the application of factors to convert concentrations to deposition will arguably make an imperceptible effect become a perceptible one.

[4] Critical Loads and Critical Levels - a guide to the data provided in APIS | Air Pollution Information System
[5] As listed on APIS – Indicative values within nutrient nitrogen critical load ranges for use in air pollution impact assessments | Air Pollution Information System (apis.ac.uk)

Table 1 – Nitrogen Deposition for Moorland/ Grassland and Woodland Based a NOx change of 1% of the Critical Level

Scenario	Threshold	1% of threshold		NOx	NO_2	NH_3	Total Ndep (kg N/ha/yr)	% of 10 kg N/ha/yr lower critical load	% of 1 µg/m³ critical level for ammonia[6]	% of 3 µg/m³ critical level for ammonia[7]
NOx Critical Level	30µg/m³	0.3 µg/m³	Concentration (µg/m³)	0.30	0.15[8]	0.03[9]	-	-	3%	1%
			Nitrogen Deposition – moorland (kg N/ha/yr)	-	0.021[10]	0.171	0.192	1.92% (3.84% for a 5kgN/ha/yr critical load)	-	-
			Nitrogen Deposition – woodland (kg N/ha/yr)	-	0.044	0.256	0.300	3%	-	-

[6] Habitat where bryophytes or lichens are an integral part

[7] Habitat where bryophytes or lichens are not an integral part

[8] Based on Defra's published NOx to NO_2 calculator. Defra's tool takes as inputs the year, road NOx, background NO_2 concentrations (taken from Defra's background concentrations maps) and the road type. The latter element defines the primary NO_2 value for the calculation to determine the total NO_2 from the road. The values provided in Table 1 are indicative for a general road type, as provided in National Highways position paper on the modelling approach for protected sites.

[9] National Highways has developed a tool to calculate an equivalent NH_3 concentration based on the modelled road NOx. The research that underpins this NH_3 tool identified different ratios of NOx:NH_3 emissions for light duty vehicles (LDVs) [cars and vans] and heavy duty vehicles (HDVs) [lorries and buses / coaches]. To enable the calculation of NH_3, the total road NOx is split into the contribution from LDVs and HDVs and entered into National Highways' NH_3 tool. The tool then calculates an equivalent NH3 concentration for LDVs and HDVs and sums the NH_3 values to calculate a total road NH3 concentration for each receptor location.

[10] Deposition velocities and dry deposition flux conversation factors for grasslands or woodland, which differ for NO_2 and NH_3, are applied to the modelled concentrations to calculate an equivalent N deposition load separately for NO_2 and NH_3. The N deposition loads from the NO_2 and NH_3 concentrations are summed together to calculate the total N dep load from the road at each receptor. Deposition velocities and deposition fluxes (and the relevant calculations) are taken from AQTAG 06.

The argument that small modelled contributions can be ignored was rejected by the UK Courts in the Wealden decision. In that case it was whether further consideration of other plans and projects in combination was required when a project alone generated <1000AADT – in this case it is whether the concentration of ammonia and Ndep requires to be considered when NOx concentration are below 0.3 µg/m³ at a protected site. However, the same point applies in that the sum of several imperceptible effects can, in principle, become perceptible.

In addition, the Wyatt ruling (2021)[11] considered whether the use of uncertainty in modelling could be used to cast doubt over the requirements of the Habitats Regulations. The argument was that uncertainty precluded a decision-maker from being able to conclude 'no adverse effect to site integrity', as reasonable scientific doubt would remain. The conclusion was that the use of precautionary variables must be used in modelling to ensure that any doubt erred on the precautionary side. This is contrary to the position of National Highways, that doubt in the modelling should be used to discount the findings of that modelling (in this case, that NOx under 0.3µg/m^3 is imperceptible so cannot be used to generate 'perceptible' concentrations of other pollutants).

The exclusion of proposals on the basis of their contribution being 'small' is therefore contrary to established caselaw. As there is a requirement to consider effects in combination with other plans and projects, there is a requirement to consider such 'small' impacts

Natural England has been advised that accepting this approach (i.e. that very small effects may be dismissed without further consideration, either due to their scale or uncertainties in their derivation) would be vulnerable to legal challenge and would also be inconsistent with the advice provided by Natural England to other public bodies.

Ways forward

There is potentially a methodology that National Highways could adopt to ensure that the use of threshold-based approaches is evidenced and could comply with the established caselaw. It is not necessarily the case that any impact, no matter how small, requires further assessment (Advocate General's Opinion in the Sweetman case). However, the approach at present does not engage with the fact that multiple imperceptible impacts (whether in-combination, or due to the nature of their size and modelling uncertainty) could become perceptible. The approach would have to take into account proliferation risk amongst plans and projects generally, the relative contributions from different types of plans and projects, and the differing decision-making approaches which apply.

However, in the absence of this methodology, it is recommended that National Highways follows the methodology outlined in Natural England guidance NEA001 which takes into account the Wealden decision in terms of in-combination assessment. It is also recommended that NOx, ammonia and nitrogen deposition are calculated separately for each protected site, and compared against the relevant critical levels and critical load. If the 1% threshold for any of them is exceeded, further consideration will be required within an appropriate assessment.

[11] Wyatt v Fareham BC [2021] EWHC 1434 (Admin)

Annex C.13 Coalhouse Point Mitigation Progress Update

Lower Thames Crossing
Technical Note
Coalhouse Point Mitigation Progress Update

Date issued: 30 June 2023

Aim: To demonstrate that the mitigation proposals at Coalhouse Point are feasible in response to Natural England advice / comments

Introduction

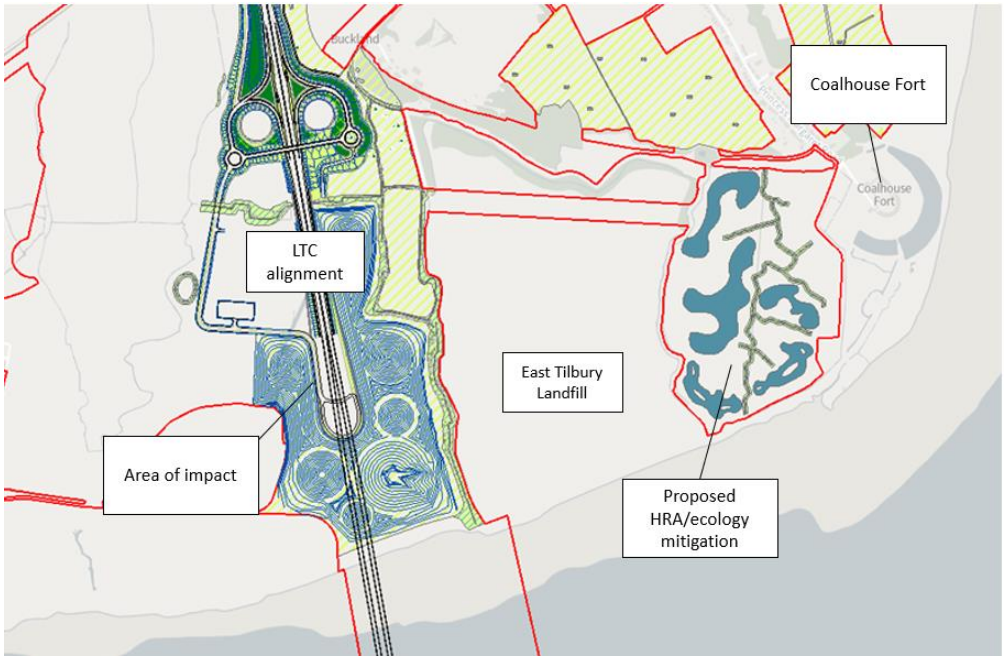
The Habitats Regulations Assessment (HRA) and Environmental Impact Assessment (EIA) rely on the proposed wetland mitigation at Coalhouse Point to mitigate effects on wintering and passage birds from the Thames Estuary and Marshes SPA/Ramsar and on invertebrates. Additionally, the site falls within a proposed SSSI, which is proposed for designation for additional features such as 'the breeding bird assemblage of open water and its margins', and so the site should be established and managed compatibly with that forthcoming designation. It must be demonstrated therefore that it is feasible to establish and maintain a range of suitable conditions for all these the target species features.

The proposed mitigation would be delivered through the creation of a wetland habitat formed of shallow scrapes and a network of ditches, delivered through the realignment of the existing land drainage that conveys flows from south to north towards Star Dam. Hydrology studies indicated that there is insufficient water in the natural catchment to maintain water levels at their design capacity throughout the year and therefore provision for a secure and suitable water supply to ensure the long-term delivery of the ecological objectives was included within the Development Consent Order Application in October 2022 via a water inlet directly from the River Thames.

Additionally, Natural England have advised that a range of salinities would need to be maintained across the site to provide suitable conditions for the range of target species, which requires sufficient quantities of river water to be available.

Plate 1 presents the location and indicative design of the proposed mitigation area at Coalhouse Point in the context of the LTC alignment as presented in the DCO application in October 2022.

Plate 1: Proposed location and indicative design of HRA and ecology mitigation at Coalhouse Point



In light of recent feedback from Natural England, this paper sets out the following:

- Set out the DCO position
- Provide an update on the following matters:
  - Design assumptions for the mitigation
  - Water demand requirements
  - Construction assumptions
- The Project's response to recent engagement with Natural England

DCO position

Table 1 sets out the key references to the mitigation at Coalhouse Point within the DCO application, including the relevant securing mechanisms for its delivery and the management of effects related to its construction.

Table 1 Key references to the mitigation at Coalhouse Point within the DCO application

DCO Application Document Number/ Title	Reference	Relevant text
6.5 Habitats Regulations Assessment - Screening Report and Statement to Inform an Appropriate Assessment APP-487	Paragraph 7.1.21 - 7.1.22	*Two habitat parcels within the functionally linked land area will be enhanced to improve functionality during the construction phase. The land parcel at Coalhouse Point (Design Principle S9.13) will also continue to provide an enhanced functionality during operation. The integrity of the site is reliant on there being sufficient functionally linked habitat outside the SPA and Ramsar site. This mitigation ensures that the functionality of that habitat, in maintaining the qualifying bird feature populations, is not reduced throughout construction or operation. In this way the integrity of the SPA and Ramsar site is not adversely affected because the function of habitats outside the designated site will be maintained.*

DCO Application Document Number/ Title	Reference	Relevant text
6.1 Environmental Statement - Chapter 8 - Terrestrial Biodiversity APP-146	Paragraph 8.5.37	*This would comprise approximately 97ha of habitat creation and has been designed to compensate the predicted habitat losses within designated sites to the north of the River Thames, as well as other important semi-natural habitats that fall outside the boundaries of designated sites. It would include a number of different habitats created to enhance the environment adjacent to the River Thames, while also increasing the area's biodiversity value. It would comprise wetland habitat (refer to Design Principles (Application Document 7.5) Clause no. S9.13), together with some areas of ponds, wet grassland and scrapes. The central ditch would also be realigned to increase its length, replicating historic drainage ditches in this area, and would be replanted to increase its biodiversity interest. This ditch would retain its existing salinity gradient, supporting the terrestrial and aquatic invertebrate species present in this area.*
7.5 Design Principles APP-516	S9.13 states	*The land parcel (34.4ha) at Coalhouse Point shall be used for habitat enhancement to maintain baseline functionality of functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar site. The land will be used to create a series of shallow scrape habitats, high tide roost features and coastal grazing marsh habitat suitable for use by the qualifying features of the SPA/Ramsar site (LE6.2 Banks and ditches, LE6.1 Water bodies and associated plants, LE6.4 Marsh and wet grassland)*
6.3 Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of Environmental Management Plan APP-336	Table 7.1 REAC table HR010 states	*The habitat creation at the land adjacent to Coalhouse Point, indicated on the Environmental Masterplan (Figure 2.4, Application Document 6.2) and described in Clause S9.13 of the Design Principles (Application Document 7.5) will be carried out prior to the commencement of works at the Northern tunnel entrance compound. The water required to maintain a range of depths within the habitat consistent with the guidance in "Manage lowland wet grassland for birds" (DEFRA 2021) will be secured prior to completion of the habitat creation works and will, unless otherwise agreed with the Secretary of State, be sourced from the River Thames by means of a water inlet with self-regulating valve or equivalent structure, passable by eels, constructed (in accordance with HR011) in the sea wall, at approximately TQ686761, to allow regulated tidal exchange, unless a formal agreement with Thurrock Council to release water on request from the Coalhouse Fort moat system has been secured*.
	HR011 states	*Works to construct a water inlet with self-regulating valve or equivalent structure (HR010) would be undertaken with the following constraints:* • *All works requiring access to the inter-tidal zone would be completed to suit tidal cycle and at periods of low water.*

DCO Application Document Number/ Title	Reference	Relevant text
		• *All piling works would be completed during periods of low water to avoid transmission of underwater noise.* • *All piling works would utilise soft start piling and other best practice techniques, as per the JNCC 2010 guidance (Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise), to help avoid noise and vibration impacts. d. Excavated arisings would be retained within the coffer dam or stored on a support barge*."

Table 1 sets out a clear framework for securing the mitigation and demonstrates the commitment to its delivery. However, in due regard to advice from Natural England and other stakeholders, further review has been carried out on a without prejudice basis to build confidence that the mitigation will be feasible and can be delivered within the envelope described by the controls in Table 1.

Design assumptions for ditches, scrapes and water levels

The proposed mitigation comprises a series of scrapes and a realigned ditch network. The alignment of the proposed ditches would replicate the historical drainage pattern and would provide a hydraulic connection between the scrapes and the water supply.

Preliminary ditch profiles for the proposed ditches and scrapes have been developed based on the requirements for a range of ecological features to provide a range of conditions across the site with multifunctional benefits. The concept profiles are set out in Plate 2 to Plate 5 for the proposed scrapes and realigned ditches.

Plate 2: Profile assumptions for scrapes – cross-section

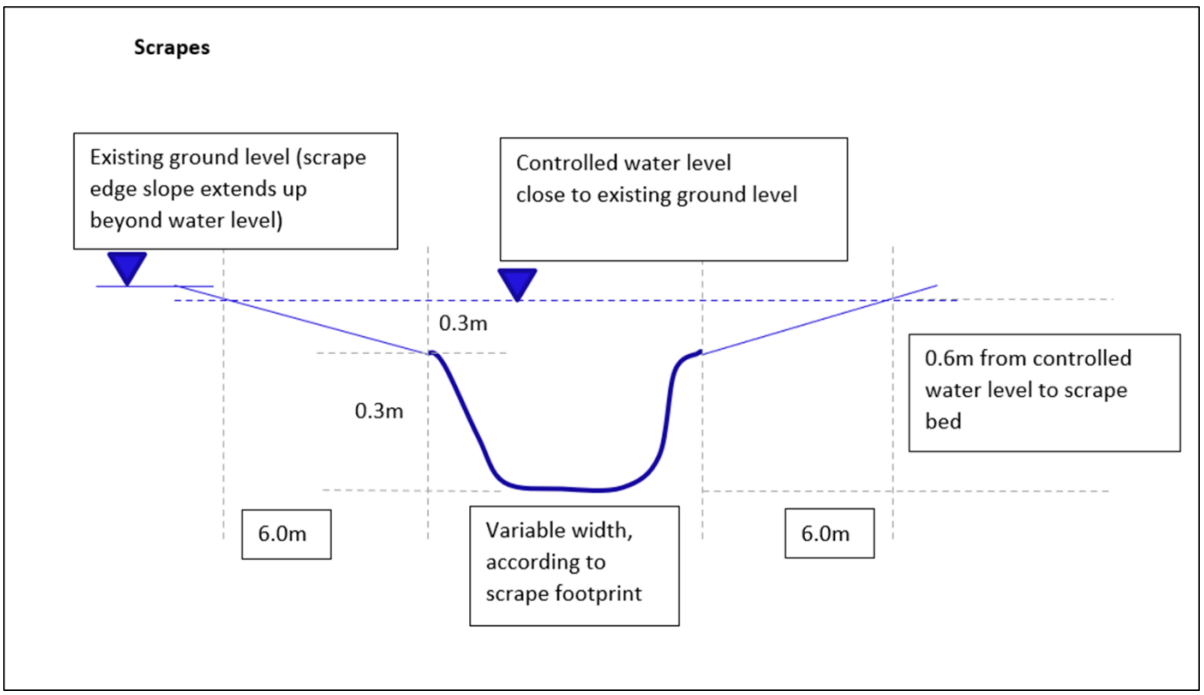


Plate 3: Profile assumptions for scrapes – indicative plan view

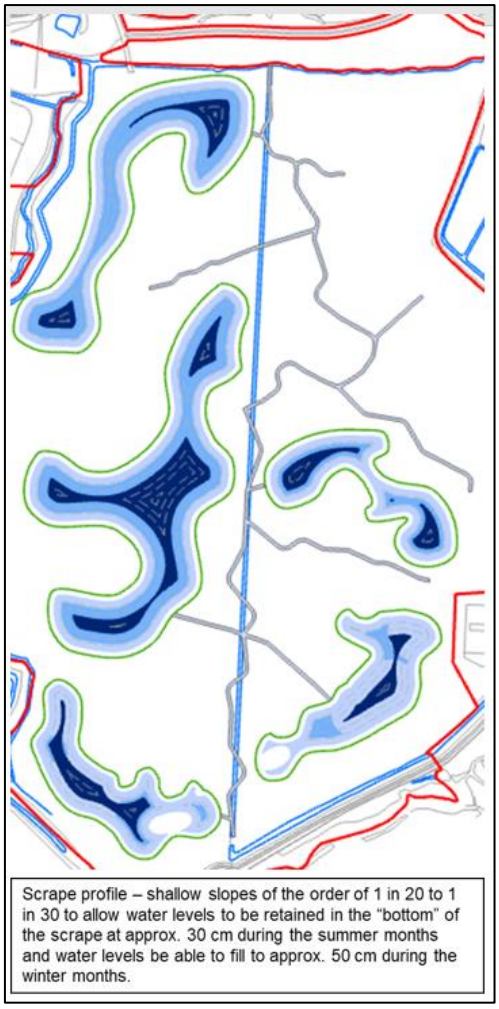


Plate 4: Profile assumptions for central ditch

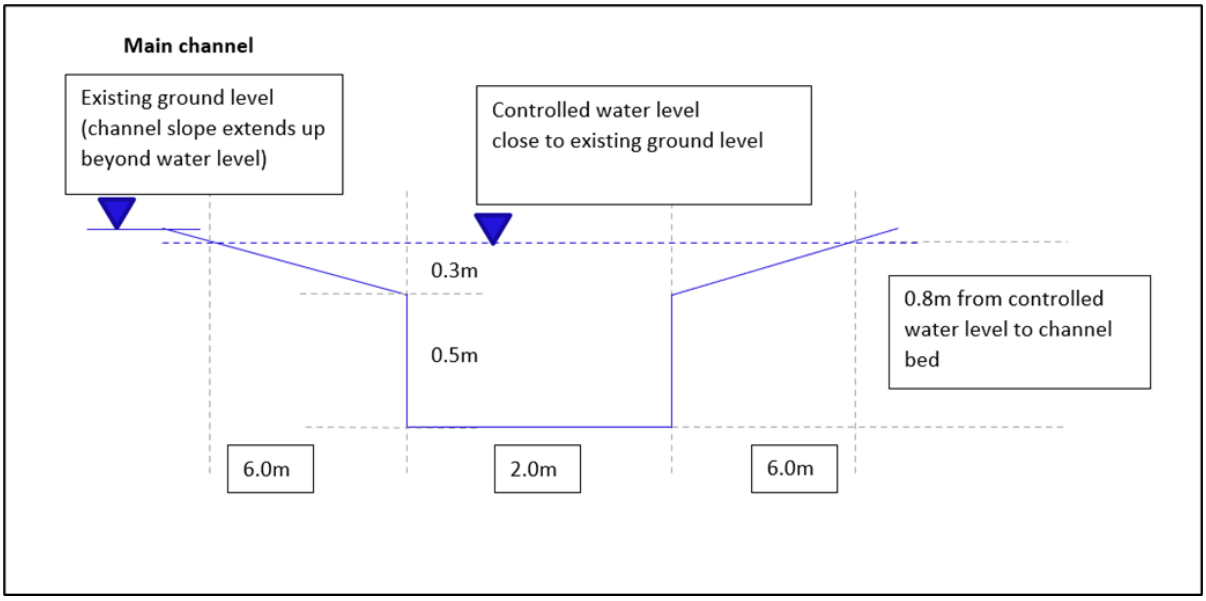
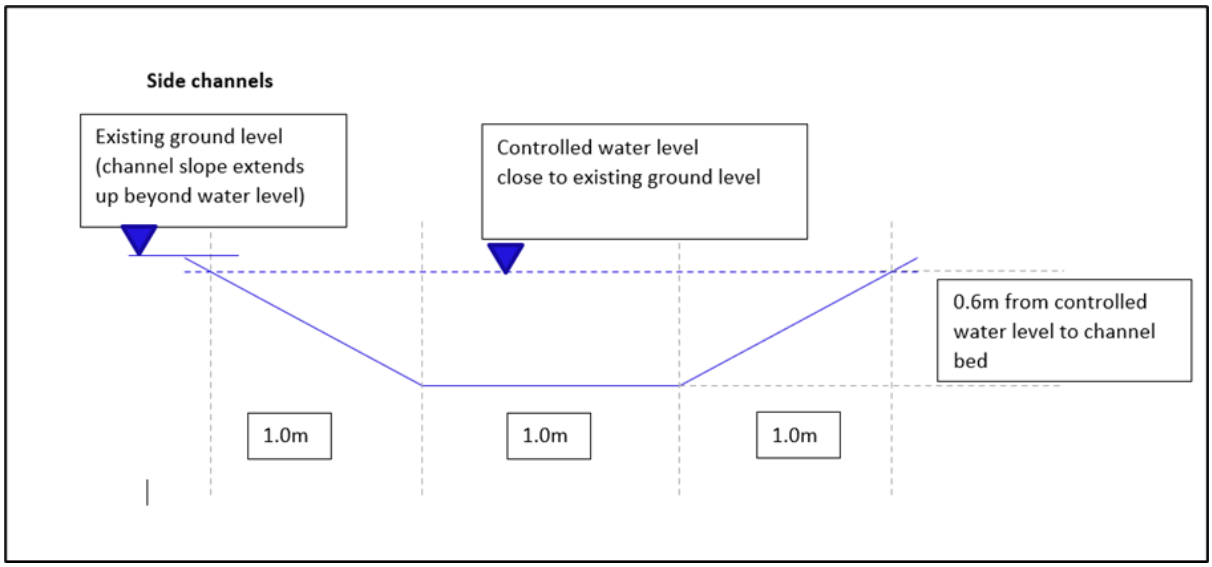


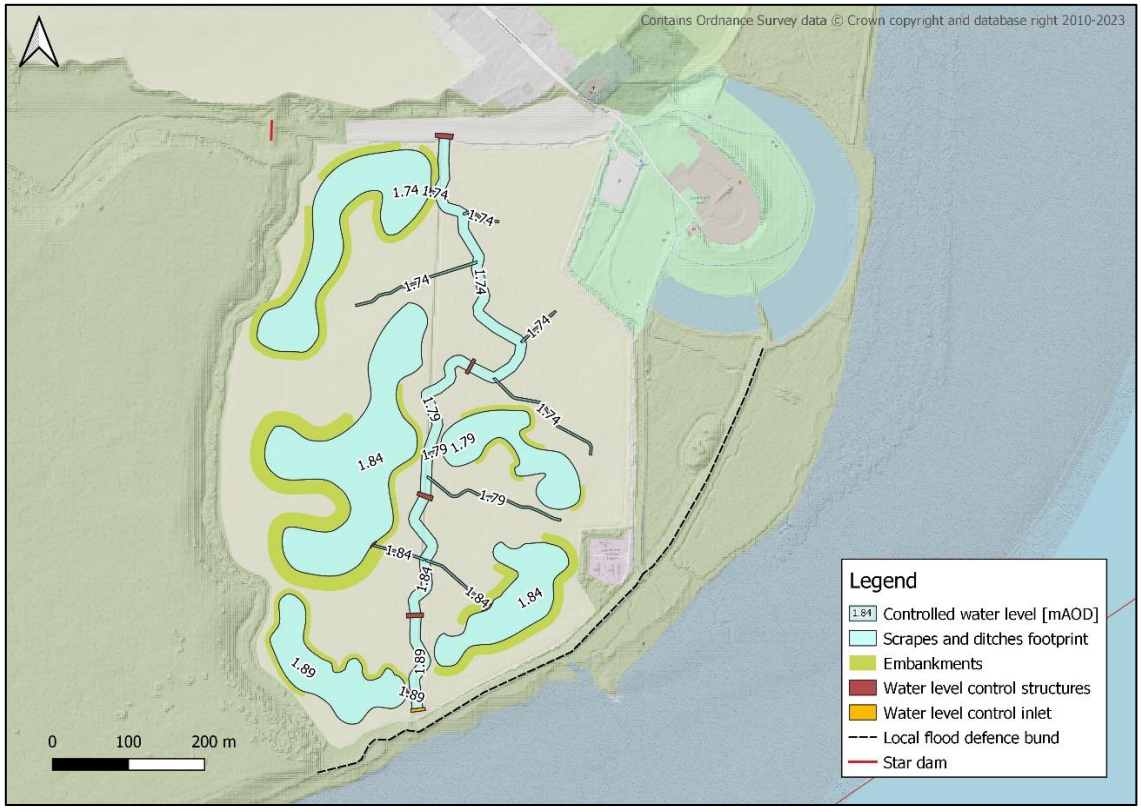
Plate 5: Profile assumptions for side ditches



The existing ground levels and requirement for water level control was reviewed to demonstrate that the scrapes and ditches can be established and appropriately managed in the long-term. The assumptions included being able to maintain water levels at near to ground level across the site (in light of detailed topographical survey information) and being able to facilitate partial drying of parts of the system to expose wet mud and encourage vegetation growth to provide foraging for target species.

Plate 6 presents the assumed water levels and water management structures to be able to manage water levels throughout the site.

Plate 6: Design assumptions for interconnections of ditches and scrapes and location of water level management system



Refinement of design assumptions for water demand

An updated estimate of the wetland water demand volumes was calculated assuming water levels would be at or near to ground level. Maximum water levels have been calculated to demonstrate that sufficient water can be delivered and secured through the DCO design. It may be desirable for some of the site to partially dry out. This could be achieved through release of water at the site's outfall from the central ditch at the northern boundary of the site and can be accommodated through the ongoing management of the wetland.

A simple annual water balance was produced with a monthly timestep to identify seasonal top up volume requirements and water level change if no top ups were possible. Monthly rainfall contribution (based on Met Office data for a rain gauge at Standford Le Hope monthly average rainfall totals 1991-2020) and Evaporation losses based on monthly mean evaporation for south-east England were calculated. An allowance for losses to ground due to infiltration was also included in the water balance.

Table 2 and Table 3 show the water balance calculations for long term average rainfall and a dry summer. The results show that water demand will exceed natural (freshwater) supply in April, May, June, July and August (and September in a dry summer), but that the volumes are relatively small with peak demand being for only 9,580m^3 in July of a dry summer.

Table 2 Monthly water balance for long term average rainfall

Month	Average Water Depth in Scrapes (m)	Average Depth in Central Ditch / Side Ditches (m)	Top Up Needed to Maintain Average Depths?	Top Up Vol (m^3)	Average Daily Top Up Volume (m^3/day)	Water Level Change with no Top Up (m)
January	0.5	0.8 / 0.6	No	-	-	+ 0.04
February	0.5	0.8 / 0.6	No	-	-	+0.03
March	0.3	0.7 / 0.5	No	-	-	+0.01
April	0.3	0.7 / 0.5	Yes	373	12	-0.004
May	0.3	0.7 / 0.5	Yes	1501	48	-0.017
June	0.3	0.7 / 0.5	Yes	3003	100	-0.033
July	0.1	0.7 / 0.5	Yes	2406	78	-0.027
August	0.1	0.7 / 0.5	Yes	2575	83	-0.029
September	0.1	0.7 / 0.5	No	-	-	+0.001
October	0.1	0.7 / 0.5	No	-	-	+0.03
November	0.3	0.8 / 0.6	No	-	-	+0.05
December	0.5	0.8 / 0.6	No	-	-	+0.05

Table 3 Monthly water balance for a dry summer scenario

Month	Target Average Water Depth in Scrapes (m)	Average Depth in Central Ditch / Side Ditches (m)	Top Up Needed to Maintain Average Depths?	Top Up Vol (m^3)	Average Daily Top Up Volume (m^3/day)	Water Level Change with no Top Up (m)
January	0.5	0.8 / 0.6	No	-	-	+0.04
February	0.5	0.8 / 0.6	No	-	-	+0.03
March	0.3	0.7 / 0.5	No	-	-	+0.01
April	0.3	0.7 / 0.5	Yes	373	12	-0.004
May	0.3	0.7 / 0.5	Yes	2987	96	-0.033
June	0.3	0.7 / 0.5	Yes	6419	214	-0.071
July	0.1	0.7 / 0.5	Yes	9580	309	-0.106
August	0.1	0.7 / 0.5	Yes	9128	294	-0.101
September	0.1	0.7 / 0.5	Yes	2806	94	-0.031
October	0.1	0.7 / 0.5	No	-	-	+0.03
November	0.3	0.8 / 0.6	No	-	-	+0.05
December	0.5	0.8 / 0.6	No	-	-	+0.05

Refinement of design assumptions for the inflow capacity of the water inlet

Data from the TE2100 model of the River Thames has been used to understand the frequency at which tide levels would exceed the invert level of the proposed water inlet with self-regulating valve or equivalent structure (at 2m AOD). Tides above this level indicate the potential for water to flow into the created wetland features and meet any water demand. Calculations have also been completed to quantify the conveyance capacity of the proposed inlet and to approximate the time it would take to fill the wetland features based on this capacity.

Tidal water levels were extracted from the closest geographical node in the TE2100 model (East Tilbury Marshes) and an approximate Mean High Waters Spring (MHWS) tide cycle was calculated over a three day period. In this period water levels would exceed 2m AOD for a total duration of 24 hours. A spring tide occurs twice each lunar month, irrespective of season.

Based on an assumed 0.3m diameter inlet, it has been estimated that sufficient volume of flow through the inlet to fill the created wetland features to the desired water levels would be conveyed within approximately 50 hours. The system could therefore be filled from a dry state within two consecutive three-day MHWS tide cycles.

Refinement of design assumptions for the predicted outflows from the water inlet

The proposed water inlet pipe is designed to only allow water into the Coalhouse Point mitigation area. It has been modelled at 2mAOD and is higher than the proposed wetland at 1.89 to 1.74 AOD. Therefore it would not be possible for the newly created scrape and ditch system to drain below the design levels even if the water inlet self-regulating valve or equivalent was compromised and remained open for any period of time.

There are no specific design assumptions with respect of eels. Eels would be able to pass through the inlet when open at high tide, and although this is a one-way valve to allow inflow of water the system is not closed and eels would be able to exit the system as per the existing arrangement at Bow water sluice. There is no connection to any other water catchments in the system currently and this would remain the case with the proposed system at the Coalhouse point mitigation area.

Refinement of design assumptions for calculation of monthly water balance

Table 4 sets out the design assumptions with regard to the monthly requirement for water to maintain the controlled water levels set out in Plate 6 and the % of the month where high tide is greater than 2.0m AoD and therefore allow filling of the system to make up the shortfall in water capacity.

Table 4 Monthly water balance calculations

Month	Natural catchment (freshwater) worst case shortfall to fill all scrapes and ditches to capacity (m^3)	% of month where high tide is above 2m AoD (which would allow filling)
January	0	20
February	0	20
March	0	20
April	267	20
May	2,794	20
June	4,889	20
July	5,500	20
August	4,714	20
September	1,222	20
October	0	20
November	0	20
December	0	20

Refinement of design assumptions for construction approach

The design assumptions for the construction of the self-regulating tidal gate or equivalent are as described in the Technical Note (Coalhouse Point Water Supply HE540039-LTC-EWE-S07-REP-ENV-00001_D01) shared with Natural England in July 2022.

In terms of the assessment potential disturbance, the HRA is clear that the construction would have inconsequential effects due to the temporary nature of the works and so no refinement of construction assumptions would add to the refinement of the assessment of disturbance.

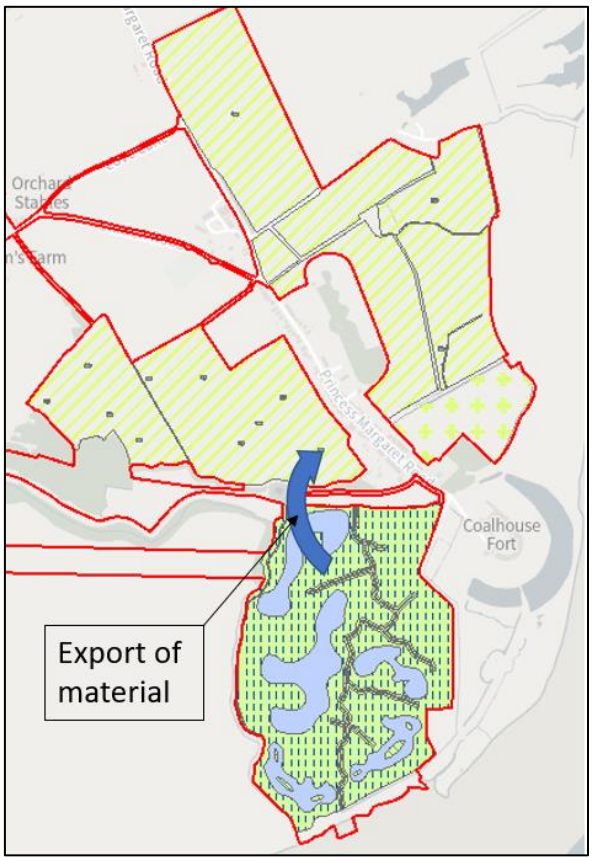
The materials balance for the excavation of the scrapes and ditches was calculated based upon the updated assumptions for the wetland design. Localised ground level raising would be required to deliver the wetland design to manage water levels and flood risk across the wetland site. In addition, excavated materials would be used to fill the existing watercourse alignment.

The construction of the wetland habitat is assumed to require the following plant over a 2-3 month period:

- Five excavators (one for each scrape and associated ditches)
- Ten 40-ton dumpers (two to service each excavator – one being loaded and one moving material)

Excavated material which is not accommodated within wetland habitat at Coalhouse Point would be retained and managed within the Order Limits as part of the overall balance of materials across the Project. For example to support the delivery of essential ecological mitigation areas to the north of the Coalhouse Point wetland area (see Plate 7).

Plate 7: Export of excess materials



The Outline Landscape and Ecology Management Plan (APP-490) management and monitoring prescriptions for the habitat at Coalhouse Point includes monitoring visits to check habitat suitability against the measures of success. Whilst these outline measures are not specifically related the water inlet the need to confirm that the water table is at or near the surface throughout the year will mean that the water inlet structure would also be monitored as standard best practice to ensure that this would occur.

The construction of the self-regulating tidal gate or equivalent will be carried out with a temporary footpath closure (The Two Forts Way) for the duration of the works. There is an alternative route option available, via the realigned South Coast Path.

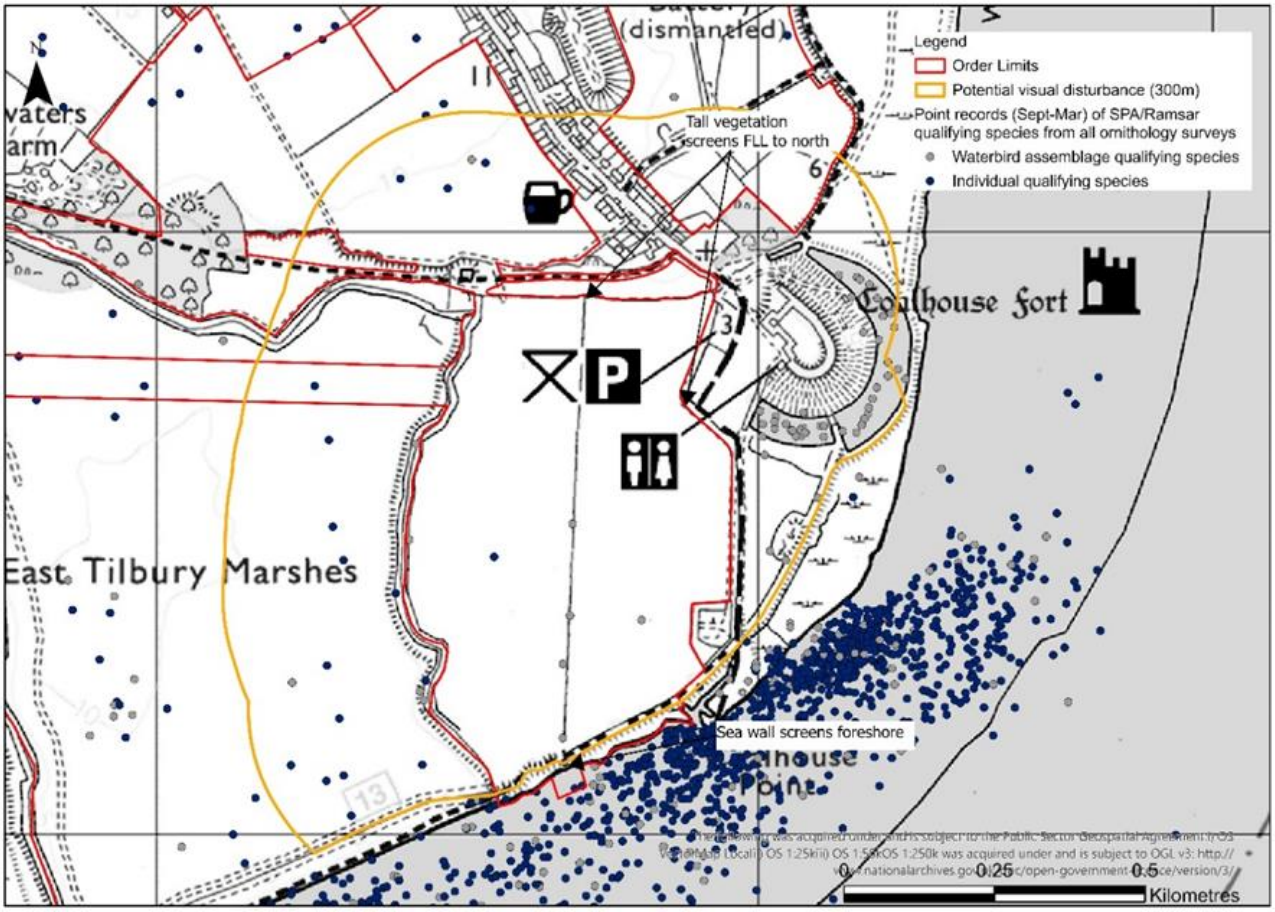
Assessment of potential disturbance from works

In response to Natural England's advice that work to create the habitat and construct the water inlet with self-regulating valve or equivalent structure should be seasonally constrained to avoid disturbance to birds from the Thames Estuary and Marshes SPA/Ramsar, we have further assessed the potential disturbance on a without prejudice basis.

The assessment of potential disturbance of the water inlet structure construction is within figures 18 and 26 and paragraphs 7.1.29 to 7.1.31 of the HRA. In summary because of the temporary nature of the works on the water inlet, and the tolerance of disturbance of the species present in significant numbers in the ZoI, the effect would be inconsequential. This is despite the relatively large numbers of birds foraging on the foreshore mud, which is where the large majority of the qualifying features forage, albeit the highest concentrations are present in areas of mud outside the ZoI in the abundant alternative habitat any displaced birds could move to.

Plate 8 below shows the distribution of qualifying and assemblage species records overlaying the habitat creation area and potential visual disturbance buffer (300m) for the habitat creation works.

Plate 8: Visual Disturbance ZOI overlayed with wintering and passage bird records



The ZoI of disturbance to SPA/Ramsar birds from the habitat creation works would not extend onto the foreshore mud as the sea defences would act as both a visual barrier between the works and the birds on the mud, and a noise attenuating feature that would prevent the disturbance thresholds being exceeded.

Equally, birds using functionally linked land to the north and east of the works would be shielded from disturbance due to the taller vegetation surrounding the north and east boundaries of the habitat creation area.

The species recorded in the over winter and passage seasons within the ZoI of disturbance were, with the exception of lapwing, limited to the overwintering assemblage. Table 5 sets out the peak counts recorded between September and March.

Table 5: Peak counts of qualifying features recorded (Sept-Mar) within the area affected by creation of the mitigation habitat

Species recorded	Individual/ Assemblage QF	Peak count	Month peak count recorded	Potential % of Thames Estuary and Marshes SPA/Ramsar site
Lapwing	Individual QF	60	Feb	3%
Curlew	Assemblage	19	Dec	All contribute to Overwintering assemblage (see below)
Greylag goose	Assemblage	6	Sep	
Little egret	Assemblage	2	Dec	
Little grebe	Assemblage	14	Oct	
Mallard	Assemblage	19	Oct	
Shelduck	Assemblage	14	Dec	
Teal	Assemblage	34	Nov	
Total Overwintering assemblage		108	Sept-Mar	0.1%

The number of birds recorded within the theoretical disturbance ZoI of the habitat creation works are insignificant. The number of birds contributing to the overwintering assemblage does not exceed 1% of the SPA/Ramsar population of assemblage species. The lapwing peak count was above 1% of the SPA/Ramsar population, but it is a more ubiquitous species with very broad habitat usage. Given the land used by lapwing in the functionally linked land is primarily agricultural (which is abundant in the area), the birds are not using the affected areas exclusively but in conjunction with other agricultural areas within the functionally linked land and so the area within the ZoI would not be of significance for the support of the species in its own right. Additionally, the species using these areas are generally species with high tolerance of disturbance and/or use a wide range of habitats which are abundant in the area. It can be concluded therefore that no consequential impact would occur.

Response to Natural England advice in regard to the feasibility of Coalhouse Point proposals

SoCG

Item 2.1.4 (Matter agreed*): Natural England considers that the consultation on the mitigation requirements and the permitting of them has been constructive, and that the proposed mitigation is feasible, subject to the Environment Agency concluding that it is likely that the permits will be authorised at the appropriate time to facilitate the effective implementation of the mitigation.

LTC response: We continue to engage with the Environment Agency through the SoCG process.

Item 2.1.68 (Matter agreed*): Timing restrictions should be in place to ensure activities resulting in significant disturbance are undertaken outside sensitive periods of the year. This requirement should be included as part of the overall mitigation measures. Where, despite best efforts, this is not possible, additional mitigation measures may be required.

LTC response: Please see response to Relevant Representation NE04 below in regard to Coalhouse Point proposals.

Item 2.1.92 (Matter agreed*): Natural England agrees with the Appropriate Assessment conclusions, with the exception of those relating to air quality (see SoCG items 2.1.94 and 2.1.95), and the feasibility of the wetland at Coalhouse Point (see SoCG item 2.1.93). Natural England is continuing to hold constructive discussions with National Highways on these matters.

LTC response (Matter under discussion): Please see responses to SoCG item 2.1.93 and Relevant Representation NE04 below.

Item 2.1.93: Natural England agrees that the functionally linked land mitigation at Coalhouse Point is feasible and would provide appropriate mitigation. Natural England sought clarity from specialists about the wording of the proposed REAC commitments HR010 and HR011 in relation to the necessary supply of water from the Thames for wetland creation and provided further advice to National Highways on 09.02.2023 and. 24.05.2023. Natural England is confident that agreement on this matter can be achieved within Examination timeframes.

LTC response: A suitable supply of water from the Thames is secured through REAC commitment HR010 by means of a water inlet with self-regulating valve or equivalent structure, constructed in the sea wall. Although other potential sources of water from the Thames are still being investigated, the DCO would provide the ability to source suitable quantities of Thames water irrespective of the potential for any alternative sources. Therefore, the feasibility of implementing the mitigation's water supply is secured.

The refinement of the design assumptions, water demand and capacity of supply from the inlet (as described above) demonstrate that the secured inlet will provide an adequate supply of suitable water to establish and maintain suitable conditions in the habitats of the mitigation.

The consideration of potential alternative sources of Thames water will continue through detailed design and if an alternative source is demonstrated to provide sufficient quantities and is preferential to the secured inlet source, this would be consulted on and proposed during the secondary consenting process, requiring consultation with Natural England and approval from the Secretary of State.

Relevant Representation NE04

Natural England considers that the construction of the project will cause a range of disturbance effects to the bird features of the Thames Estuary and Marshes SPA. National Highways has provided a Technical Note to Natural England regarding the mitigation proposed to address disturbance to SPA birds using functionally linked land in the vicinity of the north portal (including the intertidal zone). These works are proposed at Coalhouse Point, to create wetland habitat. Additional works are proposed near the south portal. Whilst we agree that these works are feasible and would provide appropriate mitigation, we continue to review the proposed REAC commitments HR010 & HR011.

Natural England agrees that these works are feasible and form appropriate mitigation (in type and scale). However, we understand that although their creation could cause disturbance, no commitment to seasonal avoidance has been made (see HRA para 7.1.28)

Natural England advise that the creation of the wetland habitat and installation of the regulated tidal exchange structure (if pursued in the absence of water secured via the Coalhouse Fort moat) should commit to avoiding the winter bird season (September – March) via a REAC commitment.

Natural England recommends that seasonal avoidance restrictions should also apply to the wetland habitat creation and tidal exchange structure installation.

LTC response:

With regard to REAC commitments HR010 & HR011, please see above response to the SoCG item.

With regard to disturbance and potential need for seasonal constraints we have undertaken further assessment of the potential for the habitat creation on a without prejudice basis (see above). Paragraph 7.1.28 of the HRA states that any disturbance from the construction of the water inlet structure, if works were undertaken in the winter or passage seasons, would be inconsequential. The further work (see above) also demonstrates that disturbance from the habitat creation works would also be inconsequential. This demonstrates that there would be no consequential disturbance of birds from the Thames Estuary and Marshes SPA/Ramsar from the works irrespective of whether the works were carried out in the winter or passage seasons.

It is therefore not appropriate to constrain the works seasonally as it is ecologically preferable to create the habitat for all the target features as soon as practicable than to delay the habitat creation to fully avoid inconsequential impacts of the works on just one of the target features.

Emailed advice 9 February 2023

Natural England is satisfied in principle these works are feasible and would provide appropriate mitigation (as per the SoCG). There are matters of detailed design of course to follow (a few headlines are captured below, from our review of the Technical Note by our specialist). The SoCG on this notes that NE is reviewing the REAC commitments HR010 & HR011.

Looking at these draft commitments, I cannot see any reference to seasonal timing restrictions for installation works for the regulated tidal exchange structure. As these works are estimated at 3 months, and are close to significant aggregations of wintering birds, seasonal avoidance seems appropriate. The same applies (but I suggest to a lesser degree) for the wetland creation itself. I note para 7.1.28 within the HRA / AA touches on this, but the Project does not seem to have translated that aspiration into a REAC commitment. We would like to understand the rationale for this, if that is the intention.

HEADLINE FEEDBACK FROM TECHNICAL NOTE

- What volume of water is needed to achieve required habitats? This informs the workings out behind the proposed use of the 600mm pipe. The available tidal window is also relevant here.
- The TN draws off a September tidal cycle. This is one of the biggest Spring tide cycles of the year, so it would be good to confirm you can achieve sufficient water supply off the tide on a smaller Spring cycle. We suggest also modelling using June (for breeding birds) and a winter month with reference to SPA concerns.
- As above, for the installation a summer window is recommended not just for avoidance reasons, but also daylight and less pronounced tidal range, probably focussing on neaps. We think the works could be achieved in less than the 12 weeks identified.
- With respect to eels, is there an internal connection to a freshwater system for this to work?
- We agree silting up should not be a worry, but checks for debris jamming should still be carried out.
- Can you confirm that temporary closure of the footpath is possible (presumably via Thurrock Council) to enable works to be undertaken?
- Further advice can be provided at a later point to maximise efficiency via on site design as a mitigation site.

LTC response:

With regard to REAC commitments HR010 & HR011, please see above response to the SoCG item.

With regard to seasonal timing restrictions for installation works for the regulated tidal exchange structure, please see above response to the Relevant Representation.

With regard to volumes of water required, the refined assumptions above demonstrate that the inlet structure will provide more than adequate supply to maintain levels and salinities in all months of the year. The refined assumptions also include an analysis of monthly water demand and supply.

With regard to eels, there are no specific design assumptions with respect of eels. Eels would be able to use pass through the inlet when open at high tide, and although this is a one-way flap valve to allow inflow of water, the system is not closed and eels could be able to exit the system, as per the existing arrangement, at Bowater sluice. There is no connection to any other catchments in this system currently and this would remain the case with the proposed scrape and ditch system at the Coalhouse Point mitigation area.

With regard to silting and checks for jamming, the Outline Landscape and Ecology Management Plan (APP-490) management and monitoring prescriptions for the habitat at Coalhouse Point includes monitoring visits to check habitat suitability against the measures of success. Whilst these outline measures are not specifically related the water inlet the need to confirm that the water table is at or near the surface throughout the year will mean that the water inlet structure would also be monitored as standard best practice to ensure that this would occur.

With regard to the temporary closure of the footpath, the construction of the self-regulating tidal gate or equivalent will be completed with a temporary footpath closure (The Two Forts Way) for the duration of the works.

With regard to further advice at a later point, the stakeholder landscape and ecology working group and the oLEMP environmental Advisory Group will be suitable forums to consider further advice during and after award of the DCO.

Emailed advice 24 May 2023

In the eventuality of the RTE structure being used, the effect on the hydrological system needs to be considered carefully. NE has reported evidence of saline lagoon species in this system which require a delicate balance of salinity gradients to order to create optimal conditions. Whilst an RTE could helpfully create an inlet for creating and maintaining wet conditions using river water, there is a risk that the RTE could also form an outlet, thus starving the system of its brackish through-put. Assurances that the system adopted can maintain the routing of river water through the ditch system here (as illustrated on slide 21) would be welcome to maintain the integrity of the conditions.

Drawdown of the proposed scrapes over the summer months when the tides are not big enough to reach the RTE is to be expected. Being able to keep at least some of the scrapes topped up until late-June would be ideal for breeding birds (this is also relevant in the context of the ‘open water and its margins’ pSSSI breeding bird assemblage discussed recently). Drying scrapes over the rest of the Summer until the September tides may be beneficial for the scrape bed to become colonised by species such as sea spurrey, whose seeds become useful duck food when the scrape re-hydrates in the Autumn. The scrapes are likely to have plenty of invertebrates for both surface feeding and shallow probing waders.

As a rule of thumb, the more water in the scrapes the better, aiming for half the site with standing water after a topping tide. Therefore, a few more extensive waterbodies than the plan suggests would be beneficial to ensure sufficient retained water, however generally the plan looks good. The diameter of the RTE pipe(s) and the energy of the water flow in and out will be one constraint needed to model in. For this reason, the use of two pipes for maximum flow over the top of the tide period could be considered.

In terms of site preparation, disturbance of the ground could usefully activate the seed-bed to generate useful plant cover.

LTC response:

The water inlet with self-regulating valve or equivalent structure would not act as an outlet as the structure would only allow flow into the area and not out from it.

REAC commitment HR010 states “the water required to maintain a range of depths within the habitat consistent with the guidance in “Manage lowland wet grassland for birds” (DEFRA 2021) will be secured” and the water inlet will allow regulated tidal exchange. These elements of the REAC commitment secure the design of the inlet to be functional to maintain required levels and regulated, and not act as a drain on the system.

The refinement of the design assumptions, water demand and capacity of supply from the inlet (as described above) demonstrate that the secured inlet will provide an adequate supply of suitable river water to maintain a range of depths across the site at different times of the year and maintain a range of salinities. The capacity of the water inlet would be far in excess of the water demand to keep the entire site fully ‘topped up’ with water all year, including when there would be a deficit without the inlet in the summer months. The water demand and inlet capacity calculations show that the amount of water to maintain all scrapes and ditches at full depth is relatively small and only in the summer months. This small demand for water volume would be greatly exceeded by the capacity of the water inlet and so there would be sufficient river water available to ‘flush’ the system if the freshwater source from rainwater were to reduce salinities. There is certainty therefore that the management of required volumes and salinity gradients would both be feasible.

The refined design assumptions demonstrate that the hydrological system will be capable of maintaining water volumes and salinity gradients at different times of the year in different areas. The assumptions show that a series of water level control structures (e.g. weirs or sluices) could maintain at least four hydrological sub units (with both scrapes and ditches) within the site that could be filled, drained, or flushed independently at different times of the year. This means that it is certain that management could maintain a range of water depths in different scrapes to support the range of species for which the mitigation is targeted.

The management prescriptions will be developed as part of detailed design and in consultation with Natural England. Those prescriptions can target specific areas and specific times of the year for specific water depths and/or salinities. The design assumptions and water demand calculations have demonstrated that any water management prescriptions likely to emerge from the detailed design, including Natural England’s advice, could be accommodated with the flexibility of water supply and management structures.

The design assumptions and water demand calculations have demonstrated that the proposed outline design would provide a suitable range of conditions for birds from the Thames Estuary and Marshes SPA/Ramsar and invertebrates. The range of conditions would also benefit the other features of the pSSSI (e.g. the breeding bird assemblage) During detailed design, it will be possible to consider the relative cover of different target habitats as part of finalising the establishment and management prescriptions. It may be that a greater area of scrape may be the final agreed design, but equally it may be that a greater length of ditches may be agreed for the

final design. The final design will need to balance the needs of the range of target features as well as views of stakeholders on priorities. For consenting purposes however, the DCO application provides certainty that the necessary conditions and management capabilities to achieve whatever specific targets are agreed in the detailed design stage can be achieved.

Site preparation prescriptions would also be a matter for detailed design, including the potential use of natural regeneration from existing seed sources.

Annex C.14 Recreational Pressure on Designated Sites

Recreational Pressure on Designated Sites

1.1 Introduction

1.1.1 This Annex 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*'.

1.1.2 This relates directly to comments made within NE's Statement of Common Ground (SoCG) with the Applicant and has been an area of ongoing discussion between the two parties. NE's Relevant representation includes reference to paragraph 2.1.80 of the SoCG (NE key issue reference NE06) which highlights two separate but related points in relation to the Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI), notably:

a. Natural England notes 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. In addition, a new car park with facilities for horseboxes and a cycle hub are proposed at Thong Lane immediately adjacent to the SSSI to the north of the A2.

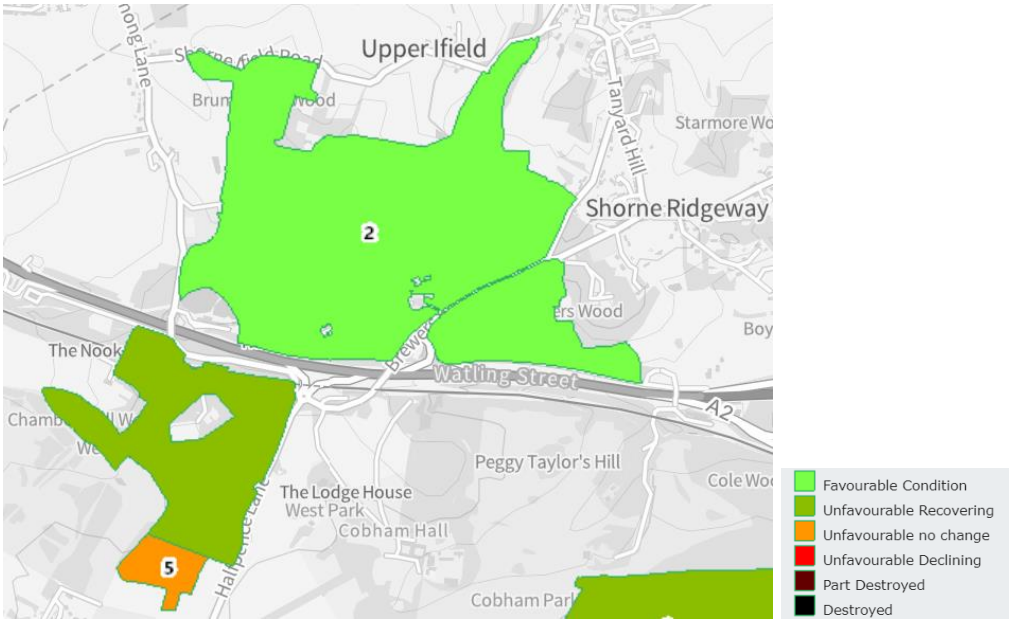
b. The Environmental Statement has not provided an assessment of the potential for direct and indirect impacts from these proposals to the SSSI resulting from factors such as increased recreational activity and loss of habitat to the surfacing, for example.

1.2 Shorne and Ashenbank Woods SSSI

1.2.1 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)*'.

1.2.2 The boundary for the SSSI is shown in Figure 1, together with current status. 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).

Figure 1 Site boundary and condition status for Shorne and Ashenbank Woods SSSI

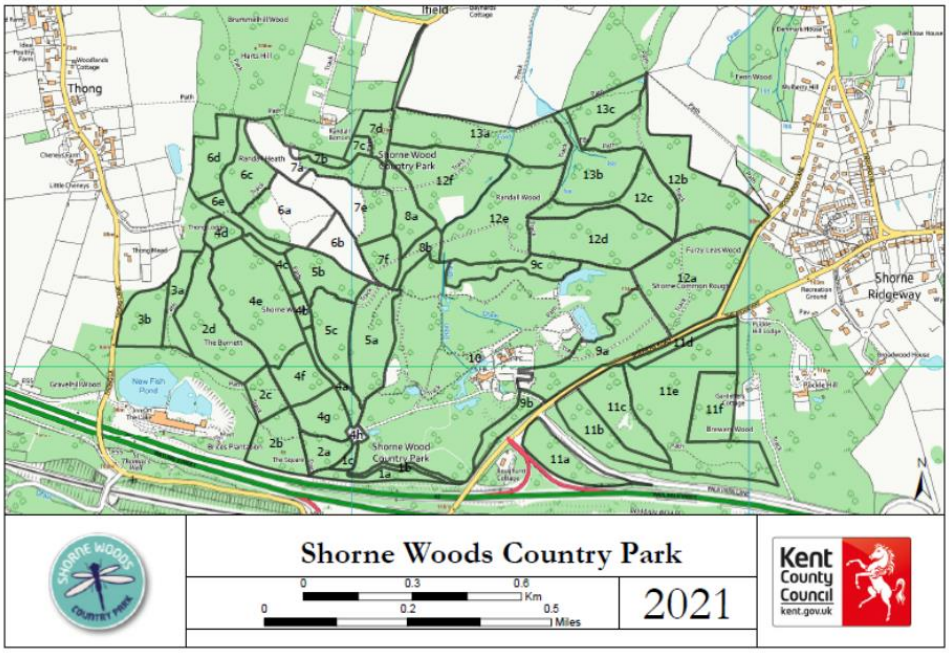


Source: Magic Map [Magic Map Application (defra.gov.uk)]

1.2.3 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.

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

Figure 2 Compartment map of SWCP



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

1.2.5 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 Figure 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.

1.2.6 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

1.2.7 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.

1.2.8 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.

1.2.9 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.

1.2.10 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.

1.2.11 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.

1.2.12 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.

1.2.13 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'.*

1.2.14 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

1.2.15 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.

1.2.16 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

1.2.17 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.

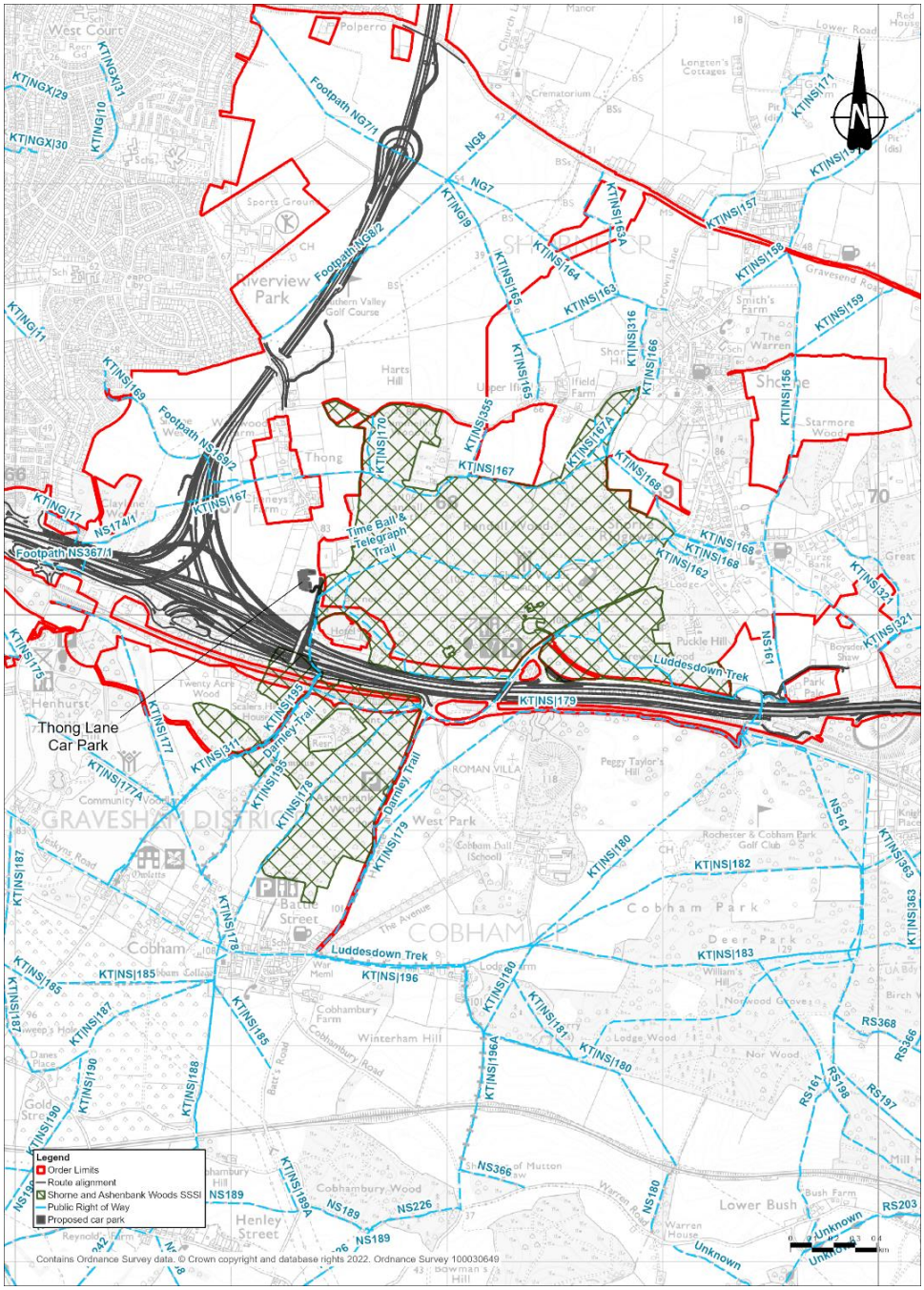
1.2.18 There are walking and cycling routes in close proximity, connecting Jeskyns Community Woodland with the wider countryside and to nearby sites such as Shorne Woods Country Park and Ashenbank Woods. There is parking on-site (pay and display) for approximately 200 vehicles (including horse boxes).

1.2.19 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].

[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)

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

Figure 3 Walking, cycling and horse-riding routes in the vicinity of the Shorne Woods and Ashenbank SSSI



1.2.21 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

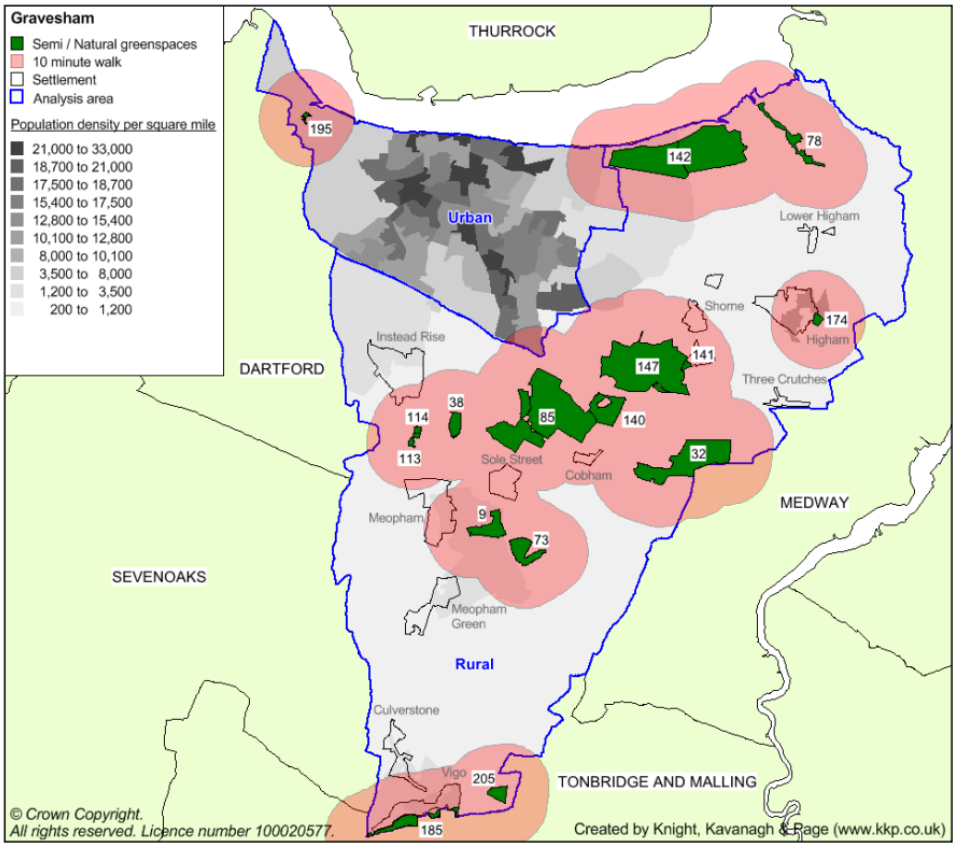
b. Footpath NS174 – the footpath is located to the north of the A2, connecting the National Cycle Network Route 177 to links with Footpath NS167 and passing in a north-east to south-west direction through Claylane Wood. The 2019 survey outlined that there were 40 pedestrian users of the route, along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

1.2.22 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

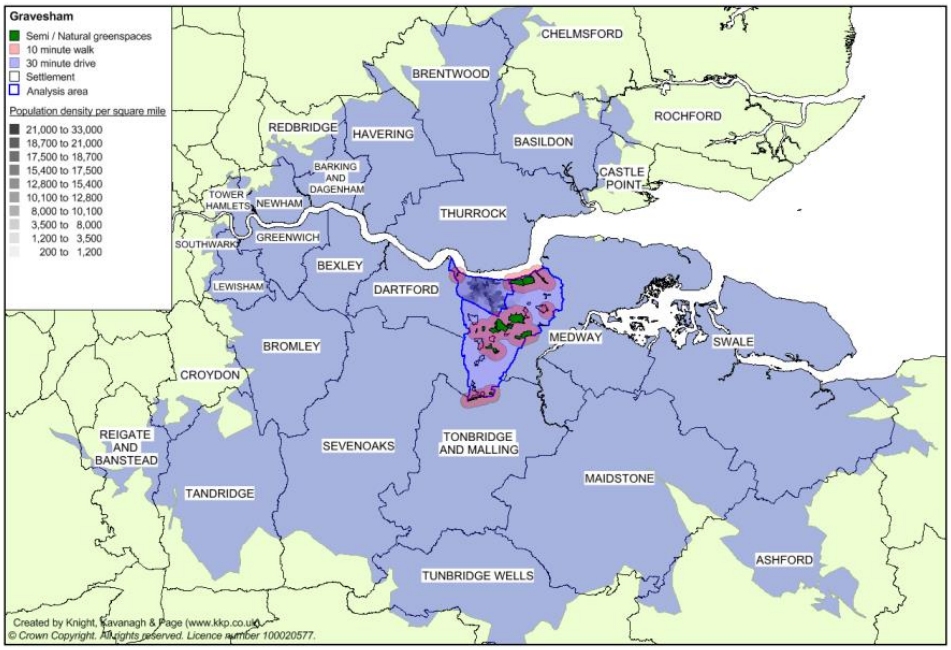
1.2.23 In relation to the likely catchment area for users of Shorne and Ashenbank Woods, this was set out in the Open Space Assessment prepared for Gravesham Borough Council by Knight, Kavanagh and Page in 2016. Guidance on appropriate walking distance and times is published by Fields In Trust (FIT) in its document Beyond the Six Acre Standard (2015); using this guidance, Figure 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.

Figure 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)

Figure 5 Natural and semi-natural greenspace within a 30-minute drivetime



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

1.2.24 Figure 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

1.2.25 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.

1.2.26 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).

1.3 Summary of proposals

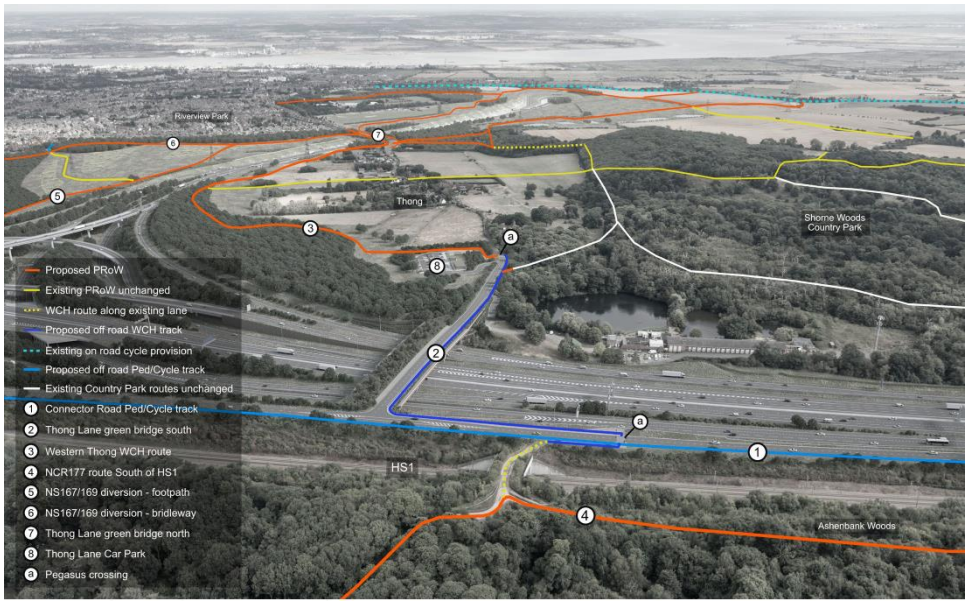
1.3.1 Natural England has highlighted two aspects of the Project in relation to recreational activity – the creation of a new car park with facilities for horseboxes and a cycle hub proposed at Thong Lane; and the nature of the proposed surfacing for a number of new and diverted public rights of way 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

1.3.2 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.

1.3.3 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 Figure 6 (the car park is numbered eight on the figure).

Figure 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]

1.3.4 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.

1.3.5 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 Figure 7.

1.3.6 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) [Application Document 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

1.3.7 New public rights of way proposed in the vicinity of the Shorne and Ashenbank Woods SSSI are shown on Figure 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.

Figure 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]

1.3.8 Figure 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 [Application Document 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 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.

1.3.9 The surface through Ashenbank Wood and Jeskyns shall be removed once the permanent route is complete if requested by the landowners, and the quality of the existing track shall be restored.

Design and surfacing of WCH routes

1.3.10 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.

1.3.11 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]).

1.3.12 General design principles for WCH routes are detailed in Table 4.1 [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.

1.3.13 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].

1.3.14 Paragraph 3.4.14 of the Project Design Report: Part E Design for Walkers, Cyclists and Horse Riders [Application Document APP-512] states that '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'.

1.4 Assessment of impacts to the Shorne and Ashenbank Woods SSSI

1.4.1 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

1.4.2 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

1.4.3 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%); a 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.

1.4.4 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

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.

1.4.5 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).

1.4.6 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).

[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.

1.4.7 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.

1.4.8 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.

1.4.9 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.

1.4.10 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[4]. 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.

1.4.11 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

[4] Annual Survey of Visits to Visitor Attractions: Latest results | VisitBritain

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 horseriding 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).

1.4.12 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 [Application Document AS-038] make further provision for the detailed design of the car park.

Indirect impacts

1.4.13 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

1.4.14 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

1.4.15 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.

1.4.16 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 [Application Document AS-038] which relates to the temporary use of land for carrying out the authorised development).

1.4.17 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

1.4.18 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.

1.5 Summary

1.5.1 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.

Annex C.15 Recreational Impacts Arising from Proposed Changes to Footpath 200

Recreational Impacts Arising from Proposed Changes to Footpath 200

1.1 Introduction

1.1.1 This Technical Note has been prepared in response to comments made by Natural England (NE) in relation to proposed recreational impacts associated with an upgrade to the footpath between Coalhouse Fort and Bowaters Battery to a bridleway. The footpath is referenced as Footpath 200 within Thurrock Council's definitive Public Rights of Way map. This is an area of ongoing discussion between National Highways and NE. Reference is made to item 2.1.67 of the SoCG which summarises NE's position as follows:

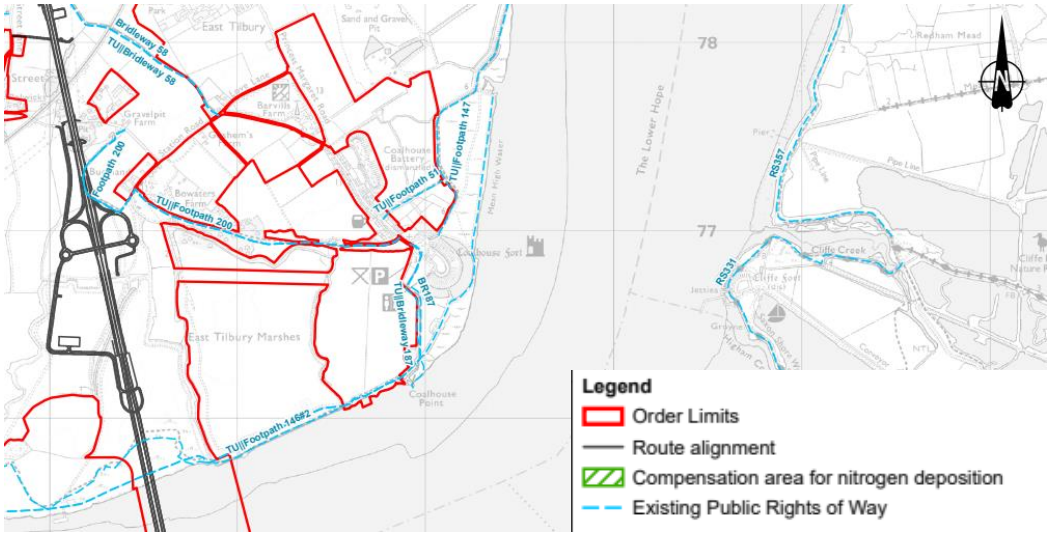
'Natural England advised it wished to understand impacts to breeding, passage and wintering birds in the context of its Site of Special Scientific Interest (SSSI) scoping study, in particular, the proposal to upgrade the footpath between Coalhouse Fort and Bowaters Battery to a bridleway.

Several meetings have been held to discuss these proposals in the context of Natural England's SSSI scoping study. Natural England does not support these proposals due to the presence of breeding bird species sensitive to disturbance. Upgrade works, for example habitat clearance and surfacing, would be likely to result in disturbance, as would increased usage of the route through the operational phase'.

1.2 Footpath 200

1.2.1 Footpath 200 is approximately 2.2km in length. The western end of the footpath joins Station Road, at Gravelpit Farm, to the east of Low Street, West Tilbury. The footpath initially heads in a south westerly direction before looping to the east, connecting with the village of Buckland, north of the quarry. At this point, the footpath continues east towards the southern end of Princess Margaret Road, immediately to the north of Coalhouse Fort. The location of the footpath is shown on Figure 1.

Figure 1 Location of Footpath 200



Source: Extract from Figure 13.2 - Population and Human Health Baseline - PRoW and WCH routes

1.2.2 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.

1.2.3 Footpath 200 was included as part of this user survey. Survey findings showed extremely low usage of the footpath, with only one pedestrian user counted along the route during the survey which took place on Sunday 25th August 2019. Other PRoWs surveyed in the vicinity of Footpath 200 showed similarly low levels of use (for example Bridleway 58 (also known as Coal Road) recorded two pedestrians). Footpath 146 (which forms part of Two Forts Way, linking Coalhouse and Tilbury Forts and is also part of Sustrans National Cycle Route (NCR) 13) is a more popular recreational route, with 40 pedestrians and 36 cyclists recorded along this route on the same day of surveys.

1.3 Summary of proposals

1.3.1 Project Design Report Part E: Design for Walkers, Cyclists and Horse Riders [**Application Document APP-512**] provides the following rationale in relation to the development of proposals for Footpath 200:

'Footpath FP200 links Coalhouse Fort to Station Road near the level crossing to the Tilbury Loop railway line. Station Road is linked to Muckingford Road by the former Coal Road, now bridleway BR58 east of Low Street Lane and BR63 to the west of Low Street Lane. BR58 crosses the Tilbury Loop Line and provides a potentially important but seemingly poorly used Walking, Cycling and Horse riding (WCH) crossing of the railway line. Footpath FP61 links East Tilbury to BR58 and Low Street Lane. There is no off-road WCH connection between BR58 and FP200. This is a missing link in the connection between Muckingford Road and Coalhouse Fort'.

1.3.2 The WCH proposals for Footpath 200 and other routes within the immediate vicinity are illustrated in Figure 2. To improve connectivity, a new bridleway (shown at number four on Figure 2) is proposed to link Station Road to Footpath 200. Footpath 200 is in turn proposed to be upgraded to bridleway status, thereby providing a link from which Coalhouse Fort can be accessed.

1.3.3 Project Design Report Part E notes in paragraph 4.3.19 that the southern section of Footpath 200 does not appear to follow that shown in the local authority mapping as vegetation has grown over the designated route. The report goes on to state that *'this southern part of FP200 will therefore be surfaced and re-designated as bridleway. These improvements will follow the trodden alignment as this follows the desire line and would require less vegetation clearance'.*

1.3.4 Footpath 200 would form part of a triangular recreational route, linking with north-south routes provided through the new Tilbury Fields area of open space and Two Forts Way.

Figure 2 Preliminary design: WCH routes in the vicinity of Footpath 200

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

1.4 Design and surfacing of WCH routes

1.4.1 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.

1.4.2 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 and are set out in the Design Principles document [Application Document APP-516]).

1.4.3 General design principles for WCH routes are detailed in Table 4.1 [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*'.

1.4.4 In all types 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].

1.4.5 Design Principle PEO.10 specifically makes reference to WCH routes north of the Thames that may have a role to play in terms of improving connectivity / completing missing links, stating that the Project shall enable recreation loops for pedestrians, cyclists and horse riders through improving existing PRoWs and forming new connections.

1.5 Assessment of impacts

1.5.1 This section provides an assessment of the likely impacts associated with the proposal to upgrade the footpath between Coalhouse Fort and Bowaters Battery to a bridleway. Potential impacts have been identified as habitat loss, principally scrub habitat which borders the existing footpath alignment; and impacts associated with increased recreational use (i.e. disturbance).

Habitat loss

1.5.2 The potential impacts from habitat loss on the bird assemblage north of the River Thames have been identified within ES Chapter 8: Terrestrial Biodiversity [**Application Document APP146**], paragraphs 8.6.344 - 8.6.349. This states that the overall level of impact from habitat loss would be reversible temporary negligible adverse, not being of a sufficient extent or magnitude to be likely to affect the conservation status of the general bird assemblage to the north of the River Thames, which is of regional level importance. This would result in effects that are slight adverse and not significant.

1.5.3 Although this does not specifically assess the effect of habitat loss as a result of the upgrade of Footpath 200 on birds using the adjacent scrub habitat around Bowater sluice, the overall conclusion is considered to be appropriate. The extent of vegetation removal compared to that which would be retained is considered to be negligible and the provision of new scrub planting immediately north of Bowater sluice, but contiguous with the existing scrub, would mean the impact would be a temporary one. The mitigation planting would result in an overall increase in scrub habitat which links to the existing and retained scrub in the area but that would be further away from the existing footpath alignment, reducing any potential disturbance effects by users of the footpath.

Disturbance arising from habitat clearance and surface upgrade activities

1.5.4 NE has expressed concern in relation to disturbance arising from construction activities relating to the upgrade of Footpath 200 as a bridleway (notably change in surfacing). Paragraph 8.5.24 of ES Chapter 8: Terrestrial Biodiversity [**Application Document APP146**] identifies good practice mitigation that would be utilised in relation to the construction phase. This states that disturbance, and incidental mortality, of breeding birds would be avoided by timing vegetation clearance and structure removal outside of the bird nesting season (March to August inclusive) wherever practicable. Where this is not practicable, appropriate measures would be taken to avoid harming birds or their nests (such as temporary fencing around nesting sites where they are immediately adjacent to construction works), under supervision of a suitably experienced Ecological Clerk of Works (ECoW). This is secured in the Environmental Statement - Appendix 2.2 - Code of Construction Practice, First Iteration of

Environmental Management Plan [**Application Document APP336**] (Register of Environmental Actions and Commitments (REAC) Reference TB004).

Disturbance arising from Increased Recreational Use

1.5.5 The current usage level of Footpath 200 and those immediately adjoining has been identified as extremely low. The principal route for WCH activity is currently along the Two Forts Way to the south of Footpath 200. With the proposed improvements and changes to the WCH environment in this part of Thurrock, and notably the creation of Tilbury Fields as a new area of recreational open space and the creation of a triangular recreational route linking Two Forts Way, Tilbury Fields and Footpath 200, recreational use can be expected to increase.

1.5.6 Walking for leisure increased during 2020 as a result of factors such as the Covid-19 pandemic, with some adults in England reporting that they were getting outside more often than usual and exercising more in outdoor spaces.

1.5.7 Walking and cycling statistics released in 2021[1] showed that although walking for leisure purposes was still the most common reason for making a trip, there had been a slight decline in number of walking trips since 2020. The average length of walking trips in 2021 is relatively low, around 0.8 miles (approximately 1.3km).

1.5.8 It is unlikely that there would be a significant increase in usage of Footpath 200 as a result of the upgrade of the footpath to a bridleway at this location alone; increases in use would most likely result from the incorporation of this route into a triangular recreational loop around Tilbury Fields and Coalhouse Fort. This loop would be around 4km in length, with parking available at Coalhouse Fort. Existing usage of Two Forts Way, along the northern bank of the Thames estuary, was recorded as around 40 users on a busy summer weekend day. The purpose of visits / usage is likely to vary, including:

a. People who are following a longer linear route along the Two Forts Way itself

b. People who are visiting Coalhouse Fort itself and who may have incorporated a short section of the Two Forts Way into their wider visit

c. People who are incorporating the Two Forts Way into a wider circular route, although noting at present there are missing links and gaps in PRoW connectivity.

1.5.9 Following construction of the Project, a new Country Park will be created at Tilbury Fields. The new Country Park will be the site of new earthworks creating viewing points over the river and towards historic assets; an additional permissive footpath will rise up a new circular landform, a section of Two Forts Way through the new Country Park, will have its surface improved, be widened and be designated as pedestrian-cycle track, and there will be a number of new permissive footpaths. Tilbury Fields will act as a destination in its own right for walkers and cyclists, thereby adding a further category to the three trip purposes identified in the preceding paragraph.

[1] Walking and cycling statistics, England: 2021 - GOV.UK (www.gov.uk)

1.5.10 With this in mind, it is considered that around a quarter of existing users of the Two Forts Way might utilise the full recreational loop presented by Two Forts Way / Tilbury Fields routes and Footpath 200. It should be noted that this would likely happen irrespective of the upgrade of Footpath 200 to bridleway, as an existing PRoW in the area. Based on the existing usage level of 40 users of Two Forts Way, this could equate to ten users of Footpath 200 on peak days such as periods of good weather or during holidays. Although this represents a high level of change (from the existing survey record of one user to ten users), it should be noted that this is ten users over the course of a 12-hour period and as such represents less than one person per hour in reality. Accordingly usage levels remain very low and are not considered to constitute a noticeable increase in levels of disturbance to birds and other wildlife.

1.5.11 The rights of way usage survey undertaken for the Project in 2019 did not identify any equestrian usage of Bridleway 58 (the nearest bridleway to Footpath 200) on the day of survey. There are two riding schools in the area to the east of Tilbury, however these are both several kilometres distant from the proposed section of upgraded bridleway and are not therefore expected to generate significant levels of regular usage (for example from undertaking hacks along local routes). Therefore although upgrading of Footpath 200 to a bridleway enables an opportunity for equestrian use, it would not be expected to be to any significant levels.

1.5.12 Mitigation measures would take the form of additional scrub planting, contiguous with the existing retained scrub but further from the footpath, and therefore the source of any disturbance. Adverse effects on the ornithological assemblage in the area arising from increased recreational usage of Footpath 200 are therefore considered to be reversible temporary negligible adverse, not being of a sufficient extent or magnitude to be likely to affect the conservation status of the general bird assemblage to the north of the River Thames, which is of regional level importance. This would result in effects that are neutral and not significant.

1.6 Summary

1.6.1 In summary, the potential ecological impacts associated with the upgraded Footpath 200 would be habitat loss, principally scrub habitat which borders the existing footpath alignment, and disturbance as a result of a small increase in user numbers. With the habitat creation proposed to mitigate these impacts, it is considered that the likely effects of this upgrade on the ornithological assemblage north of the River Thames are neutral to slight adverse and not significant.

Annex C.16 Updated Plan - Shorne and Ashenbank Woods SSSI Compensation Area

Area 4:
10 ha

Area 2:
0.7 ha

Area 1:
12.9 ha

Area 3:
9.2 ha

0 125 250 375 500
M

Legend

- Shorne and Ashenbank Woods SSSI compensation area
- Order Limits
- Site of Special Scientific Interest
- LE1.3 species rich grassland
- LE1.31 species rich chalk grassland
- LE1.32 annual wildflower grassland
- LE1.4 rock and scree
- LE2.1 native woodland and woodland edge planting
- LE2.2 woodland edge
- LE2.4 linear belt of shrubs and trees
- LE2.5 shrubs with intermittent trees
- LE2.7 scattered trees
- LE2.8 scrub
- LE2.11 woodland with non-native species
- LE4.3 native species hedge (untrimmed)
- LE4.4 native hedgerow with trees
- LE5.1 individual trees
- LE6.4 wet grassland
- LE6.11 water bodies - standing water
- LE7.3 car park
- LE8.1 open mosaic habitat
- LE8.2 Ancient Woodland compensation planting
- LE8.5 ecology pond (indicative symbol)
- LE8.7 nitrogen deposition mitigation planting

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Appr'd
P01	S8	23/06/2023	DCO Application	AR	LK	NC
P02	S9	07/09/2023	Deadline 5	AR	LK	NC

Client: national highways

Project: LOWER THAMES CROSSING

Status: PINS SUBMISSION
Original Size: A3
Revision: P02
Application Document Number: TR010032/APP/5.4.1.6
Scale: 1:10,000

Drawing Title:
Figure 1.1 -
Shorne and Ashenbank Woods SSSI
Compensation Area

Drawing Number: HE540039-CJV-EBD-SZP_EGNE00000000-DR-LE-60113

Annex C.17 HRA Mitigation Habitat Design and Management

LTC HRA Technical Note: HRA Mitigation Habitat Design and Management

1 Introduction

1.1.1 The purpose of this technical note is to summarise all of the information relevant to the securing of design and management of each HRA habitat enhancement area in to one place for ease of reference at the request of Natural England.

1.1.2 This technical note should be read in conjunction with the DCO application documents and previous technical notes relating to the proposed HRA mitigation habitat creation measures:

a. Annex C.13 of the SoCG (**REP5-038**) – which presents refined design assumptions to demonstrate that a water supply and ground works are feasible to provide the habitats to support the target species.

b. Annex A of Responses to the Examining Authority's ExQ1 Appendix G-11 Biodiversity (**REP4-195**) - Coalhouse Point Mitigation Water Supply Structure technical note which presented the feasibility of the tidal gate/inlet at Coalhouse Point.

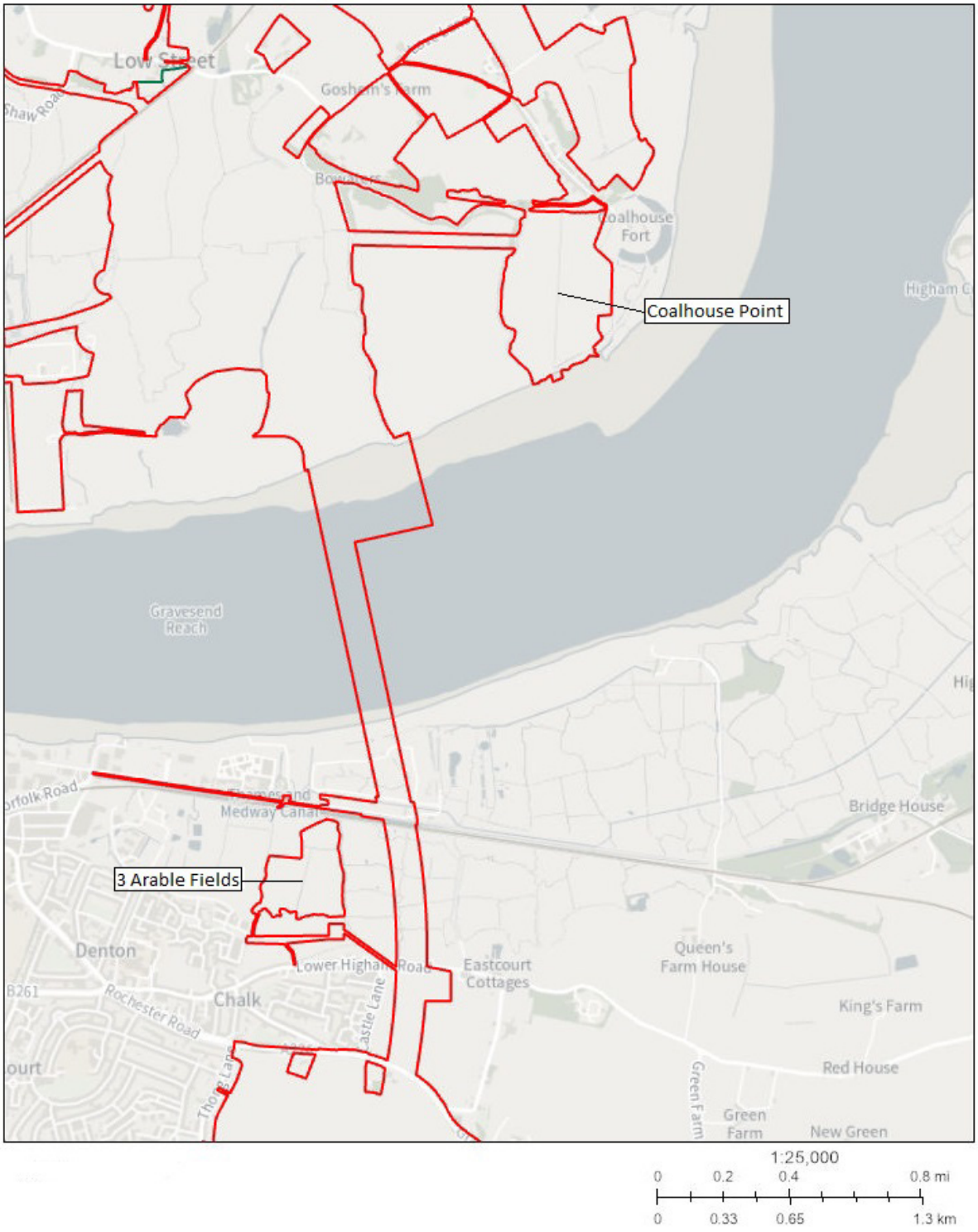
c. Annex C of Responses to the Examining Authority's ExQ1 Appendix G-11 Biodiversity (**REP4-195**) - Coalhouse Point e-mail update 24 February 2023.

1.1.3 The mitigation proposed to reduce the effect of land take and disturbance on the Thames Estuary and Marshes SPA/Ramsar, as set out in Section 7.1 of the Habitats Regulations Assessment Screening Report and Statement to Inform an Appropriate Assessment (**APP-487**), hereafter referred to as the HRA report, includes habitat enhancement at the following two locations.

a. Permanent enhancement of land at Coalhouse Point (Paragraph 7.1.23) (see Plate 1.1)

b. Temporary enhancement of 3 arable fields to the south of the firing range (Paragraph 7.1.24) (see Plate 1.1)

Plate 1.1 Location of the HRA mitigation land



1.1.4 The habitat enhancement measures are secured by a number of application documents and the relevant parts of each have been included here to illustrate the certainty of delivery of the measures within the Development Consent Order. The key aspects of securing the habitat enhancement successfully and the relevant application documents are:

a. Land acquisition – Land Plans (**REP3-011**)

b. Implementation i.e. the outline design (planting & water levels) - Environmental Master Plan (**REP4-127**), Design Principles (**REP4-146**), Register of Environmental Actions and Commitments (**REP5-048**) and Outline Landscape and Ecology Management Plan (oLEMP) (**REP4-140**).

c. Management & Monitoring – oLEMP (**REP4-140**).

1.1.5 The Mitigation Route Map (**REP4-203**) submitted at Deadline 4 includes Plate 2.1 that illustrates how the various individual control documents site within the control plan framework. Table 3.6 within the Mitigation Route Map indicates the commitments associated with the HRA mitigation measures and the relevant control by which each is secured. The parts of the table relevant to the HRA habitat enhancement are duplicated below:

1.1.6 Extract from Table 3.6 of the Mitigation Route Map

Ref	Source	Phase of Project	Purpose of control/ environmental feature	Mitigation	Control
HRA 5	HRA Screening Report and Statement to Inform an Appropriate Assessment (para 7.1.21 – 7.1.31)	Construction	To reduce effects of land take and disturbance	Provision of enhanced habitat areas to avoid and reduce the effect of habitat loss and disturbance within the functionally linked land associated with the Thames Estuary and Marshes SPA and Ramsar site and commitment to ensure a water supply for the habitat created.	Design Principle S9.13 REAC HR007, HR010 and HR011
HRA 6	HRA Screening Report and Statement to Inform an Appropriate Assessment (para 7.1.32)	Operation	To reduce effects of land take and disturbance	Continued enhanced functionality during operation	Design Principle S9.13

2 Acquisition of land

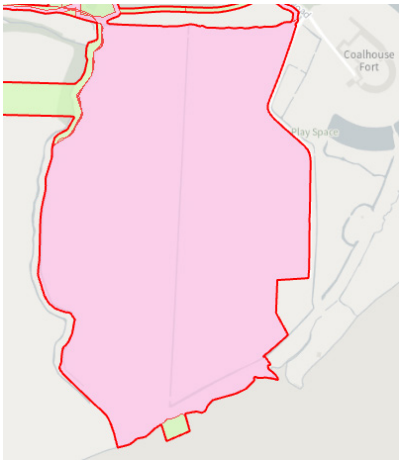
2.1.1 The Land Plans (REP3-011) identifies the land required for, or affected by, the proposed development and any land over which it is proposed to exercise powers of compulsory acquisition or any right to use land. The Land Plans show “the Order Limits” (the limits of land to be acquired or used permanently or temporarily within which the authorised development may be carried out (see article 2 of the Order)).

2.2 Coalhouse Point

2.2.1 The proposed habitat enhancement measures at Coalhouse Point (see Plate 2.1) are included within the Order Limits on the Land Plans as follows:

a. The habitat enhancement at Coalhouse Point is within an area of permanently acquisition (Plot 19-09 – Land Plans Sheet 19).

Plate 2.1 HRA mitigation land at Coalhouse Point



2.2.2 As set out in Land Plans (REP3-011) paragraph 2.1.8 (repeated below), the Applicant is directly responsible for the permanent habitat enhancement at Coalhouse Fort.

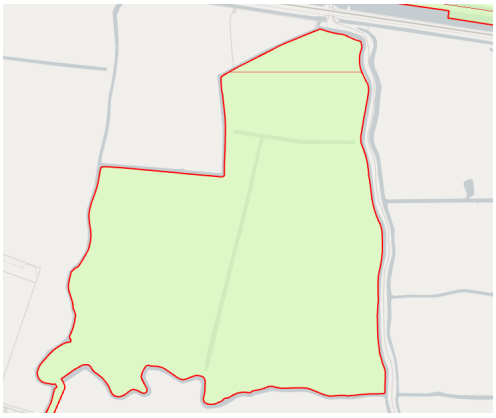
2.2.3 “Permanent acquisition of land shaded pink on the Land Plans includes land required for carrying out permanent works in connection with the Project and for which the Applicant will be directly responsible once completed or is land that needs to be acquired from a third party in connection with the provision of a substitute means of access.”

2.3 Temporary enhancement of 3 arable fields to the south of the firing range

2.3.1 The proposed habitat enhancement measures at the 3 arable fields (see Plate 2.2) are included within the Order Limits on the Land Plans as follows:

a. The habitat enhancement at the 3 arable fields is within an area of temporary possession (Plot 14-01 – Land Plans Sheet 14 and Plot 15-08 Land Plans Sheet 15)

Plate 2.2 Location of the HRA mitigation land at the 3 arable fields



2.3.2 As set out in Land Plans (**REP3-011**) paragraph 2.1.10 states that land over which temporary possession powers are sought is shaded green on the Land Plans.

3 Implementation – Design and Management

3.1 Coalhouse Point

Design

3.1.1 The outline design at Coalhouse Point is defined through the Design Principles (REP4-146) which are illustrated on the Environmental Master Plan (REP4-127) and the Management Requirements for the management area described in the Outline Landscape and Ecological Management Plan (REP4-140). The outline design is also informed by commitment HR010 (REAC in REP5-048) which sets out the requirements for implementation of the habitat enhancement in terms of timescales relative to the start of construction and the provision of a controlled water supply and levels.

3.1.2 The detailed design will be developed by the Contractor and reported within the Landscape and Ecology Management Plan (LEMP) in accordance with Requirement 5 of the DCO.

Outline LEMP (REP4-140) – The Advisory group and its role is described within the oLEMP paragraphs 4.1.13 – 4.1.15 and the terms of reference are in Appendix 1 of the oLEMP (APP-491)

The remit of this advisory group will be to:

a. oversee the implementation of the oLEMP and subsequent LEMP as approved under Schedule 2 Requirement 5 of the DCO.

b. review the monitoring outputs

c. provide a mechanism to agree matters which are required under or pursuant to the LEMP and which will be implemented following the approval of LEMP

d. provide lines of communication to amend the LEMP should an unforeseen circumstance occur meaning the approved LEMP objectives could not be achieved, following Schedule 2 Paragraph 17 of the Draft DCO.

e. to agree changes to the LEMP (and/or its prescribed management activities) when they are required, or when successful achievements of targets have been met.

3.1.3 The commitment to the provision of an Advisory Group will ensure Natural England can continue to provide advice on the detailed design of the habitat provision at Coalhouse Point.

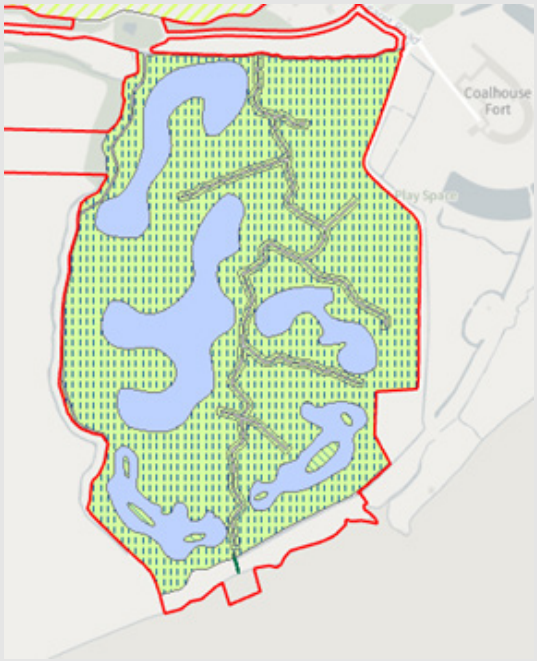
3.1.4 The purpose of the design principles is to set out the overarching design outcomes with detail of the design intent and objectives to be achieved

whilst providing some flexibility for detailed design to be developed. The outline design of the HRA mitigation land at Coalhouse Point is shown on the ES Figure 2.4 Environmental Masterplan.

Design Principles (REP4-146) - secured through Requirement 3 and Requirement 5 of the DCO and certified in Schedule 16.

Design Principle S9.13: The land parcel (34.4ha) at Coalhouse Point shall be used for habitat enhancement to maintain baseline functionality of functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar site. The land will be used to create a series of shallow scrape habitats, high tide roost features and coastal grazing marsh habitat suitable for use by the qualifying features of the SPA/Ramsar site (LE6.2 Banks and ditches, LE6.1 Water bodies and associated plants, LE6.4 Marsh and wet grassland)

Environmental Master Plan (ES Figure 2.4 (REP4-127))
Section 9 Sheets 15, 16, 19 ,20.



Habitat typologies illustrated:

a. Scrapes – EFD LE6.12 Water Bodies and Associated Plants – Shallow Scrape Habitat

b. High tide roost features – EFD LE6.21 Banks and Ditches – High Tide Roost Features

c. Ditches – EFH LE6.11 Water Bodies – Standing Water & EFD LE6.2 Banks and Ditches[1]

d. Remaining grassland – EFD LE6.41 Marsh and wet grassland – coastal grazing marsh

REAC (REP5-048) - secured through Requirement 4 of Schedule 2 of the DCO.

HR010: The habitat creation at the land adjacent to Coalhouse Point, indicated on the Environmental Masterplan (Figure 2.4, Application Document 6.2) and described in Clause S9.13 of the Design Principles (Application Document 7.5) will be carried out prior to the commencement of works at the Northern tunnel entrance compound. The water required to maintain a range of depths within the habitat consistent with the guidance in "Manage lowland wet grassland for birds" (DEFRA 2021) will be secured prior to completion of the habitat creation works and will, unless otherwise agreed with the Secretary of State, be sourced from the River Thames by means of a water inlet with self-regulating valve or equivalent structure, passable by eels, constructed (in accordance with HR011) in the sea wall, at approximately TQ686761, to allow regulated tidal exchange, unless a formal agreement with Thurrock Council to release water on request from the Coalhouse Fort moat system has been secured.

oLEMP (REP4-140) – Section 6.3 Coalhouse Point

Management Requirements

The management aim and objectives of this area are:

a. To provide a series of shallow scrape habitats, high tide roost features and coastal grazing marsh habitat suitable for use by the wintering and migrating birds that the Thames Estuary and Marshes Special Protection Area (SPA)/Ramsar is designated for.

b. To provide habitats similar to those immediately north of Tilbury Fort that currently support foraging and roosting qualifying features of the SPA/Ramsar and in line with guidance from Natural England.

c. To reinstate partially the former watercourse and ditch network to offset the loss of similar ditches during the Project construction. The ditches would have similar water quality and chemistry to those lost due to the same hydrological connection with the Thames. The

[1] EMP to be amended during Examination to Ditches EFD LE6.13 Waterbodies and associated plants – HRA ditch habitat and the EFD LE6.2 to be removed and merged with EFD LE6.41

newly created ditches would support the range of aquatic macroinvertebrates and macrophytes, and terrestrial invertebrates within the wetland and riparian habitats, as elsewhere within the ditch network.

Typologies present

The planting and habitat typologies present within this area are:

a. LE6.12 Water bodies and associated plants – shallow scrape habitat

b. LE6.2[2] Banks and ditches – high tide roost features

c. LE6.11 Ditches[3]

d. LE6.41 Marsh and wet grassland – coastal grazing marsh

The outline management prescriptions and programmes for the typologies listed above are detailed in section 8 of this document (the oLEMP).

3.1.5 The design principles in conjunction with the proposed Environmental Master Plan, the oLEMP and commitment HR010 ensure (at consenting) that there is a feasible way of achieving the target functionality (to maintain baseline functionality of functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar site). The design has been developed to provide the same habitat mosaic as the exemplar site at Tilbury Fort, which surveys have shown support all the qualifying species features of the SPA / Ramsar. It is certain therefore that the successful implementation and management of the proposed habitats will provide suitable habitats for all target species.

3.1.6 The detailed design might propose alternative designs - as long as they are in compliance with the oLEMP and can demonstrate they will achieve the target function (in consultation with Natural England).

3.1.7 The refinement of the design assumptions, water demand and capacity of supply from the inlet, as described in Annex C.13 of the SoCG (**REP5-038**) demonstrate that the secured inlet can provide an adequate supply of suitable river water to maintain a range of depths across the site at different times of the year as required by HR010. Annex C.13 showed that a series of water level control structures (e.g. weirs or sluices) could maintain at least four hydrological sub units (with both scrapes and ditches) within the site that could be filled, drained, or flushed independently at different times of the year. This means that it is certain that management could maintain a range of water depths in different

[2] oLEMP Errata – LE6.2 will be amended during Examination to LE6.21 Banks and ditches – high tide roost features

[3] oLEMP Errata– LE6.13 Waterbodies and associated plants – HRA ditch habitat will be added to the oLEMP during Examination

scrapes to support the range of species for which the mitigation is targeted. The detailed design will enable site-specific prescriptions to be developed for the management of the water levels and salinities (and set monitorable target levels in different hydrological units) across tidal ranges, seasons and draw down zones between inundations.

Management

3.1.8 The oLEMP provides outline aims and objectives and measures of success for the management of each of the habitat typologies within the Coalhouse Point mitigation land.

oLEMP Section 8.16 – LE 6.12 Water bodies and associated plants – shallow scrape habitat

Description

Shallow scrape habitats are proposed within the Project design, their primary function being to maintain the functionality of functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar. They do not form part of the Project drainage design and would be designed to maximise their value to the wintering and migrating birds that the SPA/Ramsar is designated for, following good practice guidance such as RSPB's 'Scrape creation for wildlife' and 'Creating wader scrapes and flashes on farmland' (2003). Evidence of efficacy can be found at https://www.conservationevidence.com/actions/153.

LE6.12 Water bodies and associated plants – shallow scrape corresponds to Temporary lakes, ponds, and pools in poor condition within the biodiversity net gain metric. The time to target condition following habitat creation is one year.

Outline aims and objectives

To provide enhanced functionality within functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar by providing foraging habitat for a range of bird qualifying features of the SPA/Ramsar.

Scrapes to be managed to provide optimum habitat for foraging waterfowl.

Outline measure of success

To ensure that the management objectives are achieved, the following monitoring targets have been devised to measure success:

~~a. There is semi-natural habitat (i.e. moderate distinctiveness or above) for at least 10m from the pond edge present.~~

~~b. Less than 10% of the pond is covered with duckweed or filamentous algae.~~

~~c. Pond water levels should be able to fluctuate naturally throughout the year. No obvious dams, pumps or pipework are present.~~

~~d. The pond is not artificially stocked with fish. The surface of non-woodland ponds is no more than 50% shaded by woody bankside species.~~ [4]

e. Shallow water and exposed mud habitats available for foraging by qualifying waterfowl features of the Thames Estuary and Marshes SPA/Ramsar.

f. Vegetation largely absent and not interfering with foraging of waterfowl.

g. Absence of obstructions to sightlines of waterfowl or predator observation points within 300m of scrapes.

3.1.9 Annex C.13 of the SoCG (**REP5-038**) showed that a series of water level control structures (e.g. weirs or sluices) could maintain at least four hydrological sub units (with both scrapes and ditches) within the site that could be filled, drained, or flushed independently at different times of the year. This means that it is certain that management could maintain a range of water depths in different scrapes to support the range of species for which the mitigation is targeted and therefore fulfil the outline aims and objectives and measures of success set out in the Outline LEMP.

oLEMP Section 8.18 – LE6.21 Banks and ditches – high tide roost features

Description

This typology includes raised ground or bank features within or adjacent to wet scrape habitats that are suitable for roosting of waterfowl feature species of the Thames Estuary and Marshes SPA / Ramsar during high tides. The form of high tide roost features may vary, but vegetation would be absent or short / sparse between August and March inclusive, to facilitate roosting by waterfowl.

LE6.21 Banks and ditches – high tide roost features correspond to Floodplain wetland mosaic (CFGM) in good condition within the biodiversity net gain metric. The time to target condition following habitat creation is 20 years.

Outline aims and objectives

[4] oLEMP Errata – Points a-e from the Application version of this habitat typology will be amended during Examination to be more specific for HRA purposes

To provide enhanced functionality within functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar by providing high tide roosting habitat for a range of bird qualifying features of the SPA/Ramsar.

Areas to be managed to provide optimum habitat for roosting waterfowl.

Outline measure of success

To ensure that the management objectives are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

a. The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above.

b. The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see UKHab definition). Indicator species for the specific wetland habitat type are very clearly and easily visible.

c. The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.

d. Cover of scrub and scattered trees is less than 10%.

e. Cover of bare ground less than 5%.

f. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and species indicative of sub-optimal condition1 make up less than 5% of ground cover.

g. High tide roosting features available for roosting qualifying waterfowl features of the Thames Estuary and Marshes SPA/Ramsar.

h. High tide roost features sufficiently elevated, so they are available for roosting waterfowl at spring high tides.

i. Vegetation of high tide roost features sufficiently low / sparse between August and March inclusive to not deter roosting by waterfowl.

j. Absence of obstructions to sightlines of waterfowl or predator observation points within 300m of high tide roost features.

3.1.10 Annex C.13 of the SoCG (**REP5-038**) showed that a series of water level control structures (e.g. weirs or sluices) could maintain at least four hydrological sub units (with both scrapes and ditches) within the site that could be filled, drained, or flushed independently at different times of the year. This means that it is certain that management could maintain a range of water depths in different scrapes to support the range of species for which the mitigation is targeted and therefore fulfil the outline aims and objectives and measures of success set out in the Outline LEMP.

oLEMP Section 8.20 – LE6.41 - Marsh and wet grassland – coastal grazing marsh

Description

The coastal grazing marsh typology is located within the areas of enhanced functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar and includes areas of seasonally wet grassland and shallow edged ditches.

LE6.41 Marsh and wet grassland – coastal grazing marsh corresponds to Floodplain wetland mosaic (CFGM) in moderate condition within the biodiversity net gain metric. The time to target condition following habitat creation is over 10 years.

Outline aims and objectives

To create and maintain coastal grazing marsh habitat suitable for foraging of passage and wintering waterfowl features of the Thames Estuary and Marshes SPA/Ramsar.

To maintain a grassland sward between August and March inclusive at a height of approximately 10cm or below through summer grazing and late summer mowing where necessary.

~~To maintain the ditch network as open ditches with shallow profiled banks through ditch clearance and bank profiling on a ten-year rotational management regime. Ditch management to be carried out only on one bank with one fifth of ditches being managed each year.~~[5]

Outline measure of success

To ensure that the management objectives are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

a. The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no

[5] oLEMP errata –This objective will be moved during Examination to LE6.13 as it relates to the ditch habitat typology

artificial drainage, unless specifically to maintain water levels as specified above.

b. The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see UKHab definition)). Indicator species for the specific wetland habitat type are very clearly and easily visible.

c. Cover of scrub and scattered trees is less than 10%.

d. Cover of bare ground less than 5%.

e. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and species indicative of sub-optimal condition make up less than 5% of ground cover.

f. Coastal grazing marsh available for foraging by qualifying waterfowl features of the Thames Estuary and Marshes SPA/Ramsar.

g. The sward height is maintained at approximately 10cm or below between August and March inclusive.

h. The grassland supports species typical of coastal grazing marsh with no scrub.

~~i. Ditch habitats provide diversity of habitat without interfering with foraging of waterfowl[6].~~

j. Absence of obstructions to sightlines of waterfowl or predator observation points.

3.1.11 The aims and objectives, and measures of success are generic to this typology and will be refined as part of the detailed design to fit the site-specific requirements and ensure that the habitat will function with the scrapes and ditches to support the range of species for which the mitigation is targeted.

oLEMP - Information to be included within the oLEMP during Examination for new typology of LE6.13 Waterbodies and associated plants – HRA ditch habitat

Description

The HRA ditch network proposed within the Project design, has a primary function to maintain the functionality of functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar in conjunction with other habitat typologies.

[6] oLEMP errata –This measure of success will be moved during Examination to LE6.13 as it relates to the ditch habitat typology

Although they will allow water flow through the site through a series of water control structures, they do not form part of the Project drainage design and would be designed to maximise their value to the wintering and migrating birds that the SPA/Ramsar is designated for.

Outline aims and objectives

To provide enhanced functionality within functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar by providing foraging habitat for a range of bird qualifying features of the SPA/Ramsar.

The alignment of the proposed ditches would replicate the historical drainage pattern and would provide a hydraulic connection between the scrapes and the water supply inlet.

Ditches to be managed to provide optimum habitat for foraging waterfowl. Maintain the ditch network as open ditches with shallow profiled banks (see indicative design in SoCG Annex C.13) through ditch clearance and bank profiling on a ten-year rotational management regime. Ditch management to be carried out only on one bank with one fifth of ditches being managed each year.

Outline measure of success

To ensure that the management objectives are achieved, the following monitoring targets have been devised to measure the success of the management objectives:

a. The water table is at or near the surface throughout the year, this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above.

b. The water supplies (groundwater, surface water and/or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.

c. Ditch habitats provide diversity of habitat without interfering with foraging of waterfowl.

d. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and species indicative of sub-optimal condition make up less than 5% of ground cover.

e. The ditch network is available for use by qualifying waterfowl features of the Thames Estuary and Marshes SPA/Ramsar.

f. Absence of obstructions to sightlines of waterfowl or predator observation points

3.1.12 The aims and objectives, and measures of success will be refined as part of the detailed design to fit the site-specific requirements and ensure that the ditch habitat will function with the scrapes and coastal grazing marsh to support the range of species for which the mitigation is targeted.

3.1.13 The Outline Landscape and Ecological Management Plan (oLEMP) (**REP4-140**) also details the proposed work activities required to create the habitat typology as well as the proposed management and monitoring regimes for the establishment period for each of the typologies.

3.1.14 The exact details of the work activities will be refined in consultation with all parties (i.e. National Highways, the Contractor, and the Advisory group) during the development of the LEMP and subsequent work-specific method statements.

3.1.15 The proposed programme of work that was set out in the oLEMP (**REP4-140**) has been collated in Table 3.1 for the habitat typologies provided at the Coalhouse Point mitigation area.

Table 3.1 Outline management prescriptions proposed for the Coalhouse Point mitigation area (highlighted in yellow are the work activities that will be included in the oLEMP errata during Examination)

Typology	Action			Years 1-5 of the Construction Period				
	Task	Responsibility	Season	1	2	3	4	5
LE6.12	Excavation of wet scrape habitats for foraging waterfowl features of the Thames Estuary and Marshes SPA/Ramsar. Excavated material to be used for construction of high tide roost features.	Contractor	Summer	Y				
LE6.13	Excavation of ditch network for foraging waterfowl features of the Thames Estuary and Marshes SPA/Ramsar	Contractor	Summer	Y				
LE6.13	Construction of the water inlet in accordance with HR010 and HR011	Contractor	Summer	Y				
LE6.12	Removal of all trees, shrubs, fencing posts, etc. that could act as predator observation	Contractor	Summer	Y				

Typology	Action			Years 1-5 of the Construction Period				
	Task	Responsibility	Season	1	2	3	4	5
	points within 300m of scrapes.							
LE6.21	Spreading of material excavated during creation of wet scrape habitats to form raised ground and banks suitable for roosting waterfowl.	Contractor	Summer	Y				
LE6.41	Sow suitable coastal grazing marsh grassland mix.	Contractor	Spring / summer	Y				
~~LE6.41~~ LE6.13	Clear one side of one fifth of ditches and reprofile banks to shallow gradient.	Contractor	Spring / summer	Y	Y	Y	Y	Y
LE6.12 LE6.41	Instigate grazing regime and late summer mowing where required to maintain sward height of approximately 10cm or below between August and March inclusive.	Contractor	Summer	Y	Y	Y	Y	Y
LE6.21	High tide roost features to be grazed during the summer and mown / strimmed in late summer where necessary to provide a short / sparse vegetation between August and March.	Contractor	Summer	Y	Y	Y	Y	Y
LE6.12 LE6.13 LE6.21 LE6.41	Attendance of quarterly site inspections with the Ecological Clerk of Works (ECoW)	ECoW appointed by Contractor	Quarterly	Y	Y	Y	Y	Y
LE6.41	Any unsuccessful grassland sowing to be replaced annually.	ECoW appointed by Contractor	Spring / summer	Y	Y	Y	Y	Y
LE6.12 LE6.13	Removal from scrapes of floating litter, debris, or other contaminants – weekly as part of	ECoW appointed by Contractor	As required	Y	Y	Y	Y	Y

Typology	Action			Years 1-5 of the Construction Period				
	Task	Responsibility	Season	1	2	3	4	5
	general litter maintenance							
LE6.21	All litter / foreign debris to be removed and taken off site.	ECoW appointed by Contractor	As required	Y	Y	Y	Y	Y
~~LE6.41~~ LE6.12 LE6.13	Removal from water bodies of floating litter, debris, fly tipping, surface weeds, contaminants and animal carcasses – weekly as part of general litter maintenance.	ECoW appointed by Contractor	As required	Y	Y	Y	Y	Y
LE6.12	Annual removal of unwanted vegetation from scrapes including edges / margins	ECoW appointed by Contractor	Summer	Y	Y	Y	Y	Y
LE6.12 LE6.13	Annual removal of shrubs within 300m of scrapes that could act as predator observation points and reduce overall sightlines for foraging waterfowl	ECoW appointed by Contractor	Summer	Y	Y	Y	Y	Y
LE6.21	Selective spot treatment of herbicide as required for larger pernicious weeds.	ECoW appointed by Contractor	Twice yearly - May and Septem ber	Y	Y	Y	Y	Y
LE6.21 LE6.41	Injurious weeds are to be eradicated, removed and disposed of off-site, as per the latest DEFRA / Natural England guidance.	ECoW appointed by Contractor	As required	Y	Y	Y	Y	Y

Monitoring

3.1.16 The outline monitoring frequencies and methods for all of the typologies at Coalhouse Point are the same within the oLEMP (**REP4-140**).

oLEMP Outline monitoring frequency and methods

The aim of the suggested monitoring programme is to ascertain whether the outline measures of success for each typology has been achieved.

Monitoring will commence in the first year after the habitats are created and will comprise:

a. habitat establishment and suitability

b. bird use

Frequency of monitoring visits to record the habitat establishment and suitability will be determined by the success of establishment and the frequency of monitoring adjusted accordingly to ensure relevant follow up operations are undertaken. At this stage an annual visit for the first five years following creation is proposed and carried out in late summer.

During construction and for five years post construction, annual surveys will be undertaken of use of high tide roosting features by passage and wintering waterfowl, with monthly visits August to March inclusive. Surveys will record:

a. Waterfowl species and numbers at both low and high tide during daylight.

b. Waterfowl species and numbers at high tide nocturnally.

c. Distribution of waterfowl in relation to the high tide roost features.

d. Disturbing stimuli and waterfowl behaviours in response to them (including where no response.

e. Management requirements such as vegetation removal.

UKHab surveys and condition assessments would also be undertaken to inform progress and confirm target habitat and condition is achieved (Panks, et al., 2022). National Highways' appointed monitoring party will carry out the monitoring visits as outlined in Table 8.17 below and feed back to the advisory group as part of annual monitoring reporting.

Table 8.17 Outline monitoring

Action			Years 1-5 of the Construction Period				
Task	**Responsibility**	**Season**	**1**	**2**	**3**	**4**	**5**
Annual check of habitat suitability	National Highways' appointed monitoring party	Late summer	Y	Y	Y	Y	Y
Annual survey of waterfowl	National Highways' appointed monitoring party	August to March	Y	Y	Y	Y	Y

3.1.17 The project has committed to the feedback of the monitoring results to the Advisory Group and as part of the detailed design process will create site-specific success criteria building on those set out within the habitat typologies. The Advisory Group would therefore be consulted with and able to provide advice on all aspects of the design, implementation, management and monitoring of the land at Coalhouse Point, which secures a corrective feedback mechanism if objectives are not being met.

3.2 Temporary enhancement of 3 arable fields to the south of the firing range

Design

3.2.1 The habitat enhancement of the 3 arable fields is a temporary measure to mitigate the construction phase effects of the A226 Gravesend Road and Milton Compounds. The design is defined and secured through the following commitment REAC (REP5-048).

REAC (REP5-048) – secured through Requirement 4 of the DCO

HR007: To provide enhanced functionality of functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar site during the construction period, the management of the three fields in the plot south of the Metropolitan Police firing range and adjacent to the SPA/Ramsar site (Land Registry ref. K794941) will consist of either a standing ripe crop ready to be harvested, winter stubbles or grass ley from 1 October to 1 March each year throughout the construction and operation of the A226 Gravesend Road and Milton compounds.

3.2.2 The change in land use is a temporary measure during the construction phase when effects have been identified. As it is a temporary measure, it is not included in the oLEMP, which contains measures that have long-term management requirements only.

3.2.3 The proposed changes in agricultural use which were considered to be the most appropriate way of enhancing the functionality of the functionally linked land at this location as reported within the HRA report paragraphs 7.1.34 & 7.1.37 (APP-487).

Management

3.2.4 The Contractor will be responsible for delivering the mitigation and managing the land for the time period specified in HR007. The commitment is secured by Requirement 4 of the DCO and the detailed design and management specification delivered within Second iteration of the Environmental Management Plan (EMP2). The detailed design within the EMP2 will be submitted to the Secretary of State for Approval, in accordance with Schedule 2 Part 2 of the DCO.

Annex C.18 LTC technical note: The precautionary nature of the in-combination assessment of air quality effects in the HRA

LTC technical note: The precautionary nature of the in-combination assessment of air quality effects in the HRA

1 Purpose of the technical note

1.1.1 The purpose of this technical note is to demonstrate that the in-combination assessment of air quality effects within the Habitats Regulations Assessment - Screening Report and Statement to Inform an Appropriate Assessment (HRA) [**APP-487**] has been carried out with sufficient precaution.

1.1.2 Natural England has expressed concerns that the Applicant's traffic modelling may not be sufficiently precautionary for the assessment of effects in-combination, i.e. the results of the model may not identify the change in traffic with sufficient precision to rely on in the HRA, due for example, to all local development plan allocations not being specifically included in the model.

1.1.3 The Applicant has followed Government guidance, as published in the Department for Transport's Transport Analysis Guidance (TAG) in the development of the Project's transport model (the Lower Thames Area Model (LTAM)). The Applicant considers this to be the best available source of forecast traffic data for the Lower Thames area on which to base the HRA in-combination assessment. More information on how the Applicant has built the LTAM is set out in the Combined Modelling and Appraisal Report [**APP-518**]. However, in due regard to the concerns of Natural England, the Applicant has produced this note to demonstrate that, despite any concerns over the precautionary nature of the LTAM, the HRA in-combination assessment overall is sufficiently precautionary for the purposes of complying with the regulations and case law.

2 Elements of the assessment

2.1.1 The full assessment of air quality effects (for the Project alone and in-combination with other plans and projects) within the HRA relies on the following three sequential steps.

a. The LTAM – which identifies the forecast changes in traffic across the road network

b. The air quality assessment – which, from the changes in traffic, identifies the impact, through identification of:

   i. the Affected Road Network (ARN)

   ii. European Sites within 200m of the ARN

   iii. the predicted changes in pollutants associated with the Project within European sites

   iv. exceedances of agreed thresholds within European sites that indicate likely significant effects could not be discounted

c. The ecological assessment – which considers whether the modelled pollution associated with the Project (the impact) alone and in-combination would lead to adverse effects on integrity of European sites.

2.1.2 The Applicant considers that the layers of precaution built into the assessment of the impact far outweigh any potential for residual uncertainty arising from there being (or there being a perception that there might be) different approaches to the traffic modelling that might (or might not) estimate greater traffic changes within 200m of the Affected Road Network (ARN) than is provided in the submitted HRA.

3 Precautionary nature of the LTAM

3.1.1 As the LTAM has been built in line with TAG, the Applicant considers that the outputs from the model are the best available information on forecast changes to traffic flows in the area as a result of the Project (and therefore the best available scientific information). The application of changes to the LTAM that diverge from TAG would in itself create uncertainty in the model outputs. The use of TAG in this context is endorsed and required by paragraph 4.6 of the National Networks NPS, and using a contrary standard or methodology would be contrary to Government policy and precedent.

3.1.2 Growth within the LTAM has been derived in line with TAG, specifically Unit M4 as set out in Chapter 4 of Combined Modelling and Appraisal Report - Appendix C - Transport Forecasting Package [**APP-522**]. Growth within the model is capped on a regional basis in line with DfT traffic forecasts, which are ultimately based upon Office for National Statistics population projections. This growth is then adjusted on a spatial basis to account for developments in the Uncertainty Log, these are developments that in the period between 2016 and 30 September 2021 (within the local authority areas through which the Project would pass, plus those adjacent) are under construction, have a submitted planning application or a planning permission, and thus (in accordance with TAG) carry sufficient certainty to be included within the core scenario (upon which the environmental assessment is based). Regardless of the development included within the Uncertainty Log, the level of growth within the LTAM remains in line with the national methodology and forecasts.

3.1.3 As such, LTAM includes developments of sufficient certainty, but to the extent there are developments which do not meet that requirement, growth is generally accounted for in LTAM. As the growth is nonetheless accounted for, the assessments are robust for the purposes HRA.

3.1.4 It should be noted that the Applicant has, in line with TAG, undertaken both low and high growth sensitivity tests, and these are reported within the Transport Forecasting Package. The high growth sensitivity test reflects a scenario where the level of growth within the model exceeds that forecast by DfT in the traffic forecasts used by the Applicant. At Deadline 3, the Applicant submitted NTEM 8 and Common Analytical Scenarios [**REP3-145**] which sets out a series of different model run outputs that that have been prepared using the Lower Thames Area Model (LTAM) incorporating updates and reflecting different scenarios published by DfT in November 2022.

3.1.5 The Applicant considers that if the LTAM was to be amended, in a departure from TAG, by the inclusion of additional development, such as that included in local plans, it is likely that the changes in the outputs of the model overall would not be significant as the overall level of growth within the model would remain capped in line with DfT traffic forecasts. If, contrary to TAG, the cap on growth was to be adjusted or removed entirely then of course the model outputs would then differ, but the changes to the model would also not be in accordance with TAG. If a

higher growth factor were to be used, the forecast traffic flows would not simply be an increase in traffic. Perhaps counterintuitively, modelling with higher growth can lead to some areas having a lower level of traffic increase due to capacity constraints on the network. As such, it cannot be assumed that higher growth factors would lead to higher traffic in any particular location.

3.1.6 The Applicant is therefore of the view that any changes in traffic levels that might be generated from non-TAG compliant approaches would likely be insignificant (either positively or negatively) and that a sufficient degree of certainty has been achieved to be appropriate for the purposes of HRA (noting that it is not necessary to provide evidence to a standard of absolute certainty but, instead, sufficient evidence to demonstrate there is no reasonable scientific doubt remaining as to the absence of adverse effects).

4 Precautionary nature of the air quality assessment

4.1.1 Whether or not there is a perceived residual uncertainty in the precautionary nature of the LTAM, the air quality assessment is strongly precautionary to a degree that would outweigh any concerns on the input from the traffic model.

4.1.2 Air Quality modelling in the UK is undertaken in accordance with Defra's Local Air Quality Management Technical Guidance[1] (LAQM.TG(22)), and is informed by outputs from Defra's LAQM tools such as the Emission Factor Toolkit (to derive road traffic vehicle emission factors) and Background Pollution Maps (to derive background pollution concentrations). The air quality modelling has been based on the most recent Defra LAQM tools and assumptions available at the time the assessments were undertaken.

4.1.3 Following the advice of DMRB LA 105[2], National Highways long-term trend gap analysis factors have been used to account for uncertainty in the vehicle emission factors, and consequently the rate at which nitrogen dioxide (NO_2) concentrations would decrease between the 2016 base year and the 2030 opening year scenarios (as described in paragraphs 5.3.93 to 5.3.97 of Environmental Statement Chapter 5: Air Quality [**APP-143**]). This has led to the uplift of modelled NO_2 concentrations (which also form the basis of the N deposition calculation for the NO_2 component) in the opening year scenario compared to the Defra LAQM tools used on non-National Highways projects. As a result of this approach, the modelled NO_2 outputs at Epping Forest SAC and North Downs Woodlands SAC have been uplifted by a factor of 2.5 to 2.8, in the opening year scenarios, prior to the calculation of the NO_2 contribution to N deposition. This illustrates the level of precaution that is already included in the assessment, particularly as recent air quality monitoring data for the study area shows that NO_2 concentrations are declining at a faster rate than assumed in the modelling.

4.1.4 The air quality modelling has also used a conservative estimate when predicting the future changes in background N deposition as it assumes no change between the base year (2016) and opening year (2030). N deposition with the Project is likely to be lower than calculated in the assessment as there are likely to be future national reductions in NOx and ammonia emissions in response to improvements in technology (e.g. uptake of electric vehicles), and local and national government actions such as those outlined in the Defra (2023) Air Quality Strategy[3]. The Joint

[1] Defra (2023) Local Air Quality Management Technical Guidance (LAQM.TG22) https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

[2] Highways England (2019). Design Manual for Roads and Bridges, LA 105 Air Quality. https://www.standardsforhighways.co.uk/tses/attachments/10191621-07df-44a3-892e-c1d5c7a28d90?inline=true

[3] Defra (2023) Air Quality Strategy, Framework for local authority delivery https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1180706/Air_Quality_Strategy_Web.pdf

Nature Conservation Committee (2020) 'Nitrogen Futures' Report[4] predicted that UK nitrogen deposition would decrease by approximately 14% between 2017 and 2030 under a business-as-usual scenario, whereby only currently adopted policy was accounted for; this scenario is therefore likely to be pessimistic as it expected that further policy and mitigations would be adopted between 2017 and 2030. Under the most likely scenario, UK nitrogen deposition was predicted to reduce by approximately 21% by 2030.

4.1.5 The Project air quality modelling uses an ADMS dispersion model which assumes that nitrogen oxides (NO_x) emitted (from vehicle exhausts) into the atmosphere are not lost through deposition or chemistry (i.e. the model is conservative as it uses the same emission factors for 0m to 200m from the road) and so NO_x concentrations are likely to be overpredicted further from roads. This is important as the N deposition associated with NO_2 and particularly ammonia (NH_3) (which has a much higher deposition velocity than NO_2) has been calculated based on the NO_x concentrations modelled, and so rates of N deposition are likely to be overpredicted as there would be less NO_2 and NH_3 present (as distance increases from the road) than assumed in the model. This will particularly apply to nitrogen deposition associated with NH_3 due to its high deposition velocity (approximately 10 times higher than NO_2). This means that the pollutant levels shown in the model (of which the ecological consequences are assessed in the consideration of likely significant effects and adverse effects on integrity) are inherently precautionary.

4.1.6 The real-world monitoring of pollutants from roads (vehicle emissions) has shown that pollutants tend to reduce to background (i.e. drop out) quickly, particularly within the first 50m from the source. As stated, models are conservative and will generate changes in concentrations to many decimal points at whatever distance the user selects from the road. This is why guidance is in place which determines the area that the impacts are confined to as the modelled outputs, i.e. 200m from the road.

4.1.7 While it is acknowledged that there is less monitoring undertaken for NH_3, compared to NO_2, there is evidence from real-world monitoring which indicates a drop off of NH_3 with distance from the source. In particular, the Centre for Ecology and Hydrology (CEH) published a paper[5] on concentration-dependent deposition velocities for ammonia: moving from lab to field, which provided results of monitoring along a transect. This paper showed that, even where concentrations of NH_3 close to the source were higher than 100µg/m³ (over 10 times the concentrations modelled as a result of roads), concentrations were close to zero at just over 100m. Monitoring of NH_3 next to a road in Ashdown Forest by Air Quality

[4] Joint Nature Conservation Committee (2020) Nitrogen Futures https://data.jncc.gov.uk/data/04f4896c-7391-47c3-ba02-8278925a99c5/JNCC-Report-665-FINAL-WEB.pdf

[5] Cape, J. Neil; Jones, Matthew R.; Leith, Ian D.; Sheppard, Lucy J.; van Dijk, Netty; Sutton, Mark A.; Fowler, David. 2008 Concentration-dependent deposition velocities for ammonia: moving from lab to field. [Poster] In: European Geophysical Union, Vienna, 2008. (Unpublished). Abstract available at: https://nora.nerc.ac.uk/id/eprint/2777/1/N2777_Cape.pdf

Consultants (AQC)[6] also illustrated the rapid drop off in NH_3 close to the road, especially within the first 30m. These studies provide further robust evidence that using a 200m distance to assess the impacts from road schemes is precautionary, and that modelling results beyond 200m would be unnecessary for a precautionary assessment.

[6] Air Quality Consultants (2020) Ammonia emissions from roads for assessing impacts on nitrogen-sensitive habitats. [Online] Available at: https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=3aa4ec2e-ee4e-4908-bc7a-aeb0231b4b37

5 Summary to be included in the updated assessment (HRA) of AQ effects

5.1.1 The Applicant considers that the air quality assessment within the HRA is sufficiently precautionary for the purposes of the regulations and compliance with case law. The traffic model follows Government guidance and is considered best available scientific information. Suggested changes to the model would result in immaterial differences in the outputs for the purposes of the subsequent assessments of air quality and ecological effects. Any residual uncertainty that there might be as to the level of precaution within the traffic model would be far outweighed by the levels of precaution built into the air quality assessment elements of the in-combination assessment carried out in the HRA.

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