



The Planning Inspectorate
Yr Arolygiaeth Gynllunio

REPORT on the IMPLICATIONS for EUROPEAN SITES

Proposed Port Terminal at Former Tilbury Power Station

Tilbury2

An Examining Authority report prepared with the support of
the Environmental Services Team

Planning Inspectorate Reference: TR030003

13 July 2018

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1. INTRODUCTION

Background

- 1.1 The Port of Tilbury London Limited (the Applicant) has applied to the Secretary of State for a development consent order (DCO) under section 37 of the Planning Act 2008 (as amended) for the proposed Tilbury2 project (the Proposed Development). The Secretary of State has appointed an Examining Authority (ExA) to conduct an examination of the application, to report its findings and conclusions, and to make a recommendation to the Secretary of State as to the decision to be made on the application.
- 1.2 The relevant Secretary of State (in this case the Secretary of State for Transport) is the competent authority for the purposes of the Habitats Directive¹ and the Habitats Regulations² for applications submitted under the Planning Act 2008 regime (as amended). The findings and conclusions on nature conservation issues reported by the ExA will assist the Secretary of State in performing his duties under the Habitats Regulations.
- 1.3 This Report on the Implications for European Sites (RIES) compiles, documents and signposts information provided within the DCO application for Tilbury 2, and the information submitted throughout the examination by both the Applicant and Interested Parties, up to Deadline 5 of the examination (6 July 2018) in relation to potential effects on European Sites³. It is not a standalone document and should be read in conjunction with the examination documents referred to. Where document references are presented in square brackets [] in the text of this report, that reference can be found in the examination library published on the National Infrastructure Planning website at the following link:
<http://infrastructure.planninginspectorate.gov.uk/document/TR030003-000523>
- 1.4 This report is issued to ensure that Interested Parties, including the statutory nature conservation body (Natural England (NE)), are formally consulted on Habitats Regulations matters. This process may then be relied on by the Secretary of State for the purposes of Regulation 63(3) of the Habitats Regulations. Following consultation, the responses will be

¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as codified) (the 'Habitats Directive').

² The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations).

³ The term European Sites in this context includes Sites of Community Importance (SCIs), Special Areas of Conservation (SACs) and candidate SACs, Special Protection Areas (SPAs), possible SACs, potential SPAs, Ramsar sites, proposed Ramsar sites, and any sites identified as compensatory measures for adverse effects on any of the above. For a full description of the designations to which the Habitats Regulations apply, and/ or are applied as a matter of Government policy, see PINS Advice Note 10.

considered by the ExA in making our recommendation to the Secretary of State and made available to him along with this report. The RIES will not be revised following consultation.

- 1.5 The Applicant has not identified any potential impacts on European sites in other EEA States⁴. Only UK European sites are addressed in this report.

Documents used to inform this RIES

- 1.6 The Applicant provided with the DCO application a HRA report entitled "ES Appendix 10.O: Habitat Regulations Assessment (HRA) Report" [APP-060], which included screening matrices.
- 1.7 In response to the ExA's questions and representations made by Interested Parties during the examination, the Applicant provided a 'Habitats Regulations Assessment (HRA) Stage 2 Report' [REP4-018] at Deadline 4 (22 May 2018) which superseded [APP-060]. This was further superseded at Deadline 5 (6 July 2017) by an updated HRA Stage 2 Report [REP5-032].
- 1.8 Other documents referred to in this RIES are listed below.

Procedural Decisions

- Post-acceptance section 51 advice to the Applicant [PD-003];
- First written questions (FWQs) [PD-007]; and
- Second written questions (SWQs) [PD-010].

Application documents

- Environmental Statement (ES) [APP-031];
- Lighting Strategy [APP-044];
- Drainage Strategy [APP-090];
- Construction Environmental Management Plan (CEMP) [APP-163]; and
- Operational Management Plan (OMP) [APP-165].

Additional submissions

- Applicant – Response to relevant representations [AS-049].

Relevant Representations

- Natural England [RR-025].

Deadline 1 (20 March 2018)

- Applicant – OMP v1 [REP-008];

⁴ European Economic Area (EEA) States

- Applicant – Landscape and Ecological Management Plan (LEMP) version 2 [REP1-010];
- Applicant - Response to the ExA’s FWQs [REP1-016]; and
- Natural England - Written Representation and Response to FWQs – [REP1-074].

Deadline 2 (4 April 2018)

- Applicant - Response to the written representations, Local Impact Reports and Interested Parties' responses to FWQs [REP2-007]; and
- Marine Management Organisation (MMO) – Deadline 2 Submission [REP2-012].

Deadline 3 (30 April 2018)

- Applicant - Written Summary of Case at Issue Specific Hearing (ISH) of 18 April 2018 [REP3-029];
- Environment Agency – Deadline 3 Submission [REP3-034]; and
- Natural England - Written Submission of Oral Case & Post-Hearing Submissions [REP3-042].

Deadline 4 (22 May 2018)

- Natural England – Deadline 4 Submission [REP4-008];
- Applicant – HRA Stage 2 Report [REP4-018]; and
- Applicant – Response to the ExA’s SWQs [REP4-020].

Deadline 5 (6 July 2018)

- Applicant – Revised Limits of Dredging Plan v3 [REP5-002];
- Applicant – Bird Monitoring and Action Plan [REP5-031];
- Applicant – Updated HRA Stage 2 Report [REP5-032];
- Applicant – Written summary of case on Ecology and HRA issues at the ISH of 28 June 2018 [REP5-036];
- Applicant - Ecological Mitigation and Compensation Plan (EMCP) [REP5-041];
- Applicant – Revision 4 of the draft DCO [REP5-044];
- Applicant – Explanation of changes to the draft DCO [REP5-046];
- Environment Agency – Deadline 5 Submission [REP5-055]; and
- Natural England – Deadline 5 Submission [REP5-061].

Structure of this RIES

1.9 This report is structured as follows:

- **Section 2** identifies the European sites that have been considered within the DCO application and during the examination period, up to Deadline 5 (6 July 2018) and the plans/projects considered in the in-combination assessment. It also provides an overview of the issues that have emerged during the examination.
- **Section 3** identifies the European sites and qualifying features screened by the Applicant for potential likely significant effects (LSE), either alone or in-combination with other projects and plans. This section also identifies where Interested Parties have disputed the Applicant's conclusions.
- **Section 4** identifies the European sites and qualifying features which have been considered in terms of adverse effects on site integrity, either alone or in-combination with other projects and plans. This section also identifies where Interested Parties have disputed the Applicant's conclusions.
- **Section 5** sets out the range of matters the ExA is particularly inviting comments upon.
- **Annex 1** identifies the potential effects upon European sites which have been considered within the Applicant's submitted HRA Report.
- **Annexes 2 and 3** comprise screening and integrity matrices for the two European sites. The matrices are based on those provided in the Applicant's HRA Stage 2 Report [REP5-032] and have been updated by the ExA, with the support of the Planning Inspectorate's Environmental Services Team, using the documents listed above to summarise the evidence submitted by the Applicant and Interested Parties up to Deadline 5 (6 July 2018).

2. OVERVIEW

European Sites Considered

- 2.1 The project is not connected with or necessary to the management for nature conservation of any European site, and is therefore subject to the Habitat Regulations.
- 2.2 The proposed Order Limits of Tilbury2 do not overlap directly with any European site. However, the Applicant's initial HRA Report [APP-060] identified the following European sites (and qualifying features) for which the UK is responsible for inclusion within the assessment:

Table 2.1: European sites and qualifying features considered in the Applicant's HRA Report [APP-060]

Name of European site	Qualifying features
Thames Estuary and Marshes Special Protection Area (SPA)	Pied avocet (winter)
	Hen harrier (winter)
	Ringed plover (passage)
	Grey plover (winter)
	Red knot (winter)
	Dunlin (winter)
	Black-tailed godwit (winter)
	Common redshank (winter)
	Waterbird assemblage (winter)
Thames Estuary and Marshes Ramsar site	Criterion 2 - nationally rare and scarce plant and invertebrate species
	Criterion 5 – waterfowl assemblage (winter)
	Criterion 6 - Ringed plover (passage)
	Criterion 6 – Black-tailed godwit (passage)
	Criterion 6 - Grey plover (winter)
	Criterion 6 – Red knot (winter)
	Criterion 6 - Dunlin (winter)
	Criterion 6 – Common redshank (winter)

- 2.3 The relationship between the proposed Order Limits and the Thames Estuary and Marshes SPA and Ramsar site is shown on Figure 1 of the

Stage 2 HRA Report [REP5-032]. The two sites cover the same area on the north (Essex) bank of the River Thames, but the Ramsar site is larger than the SPA on the south (Kent) bank. The nearest part of any European site is approximately 1.5km to the south-east of the Tilbury2 Order Land.

2.4 These European sites were selected for inclusion within the assessment based on the maximum extent of the likely impacts, which the Applicant established as follows:

- air quality and water quality impacts - atmospheric dispersion and hydrodynamic modelling;
- impacts from lighting and disturbance to water birds - use of the Waterbird Disturbance Mitigation Toolkit (Institute of Estuarine & Coastal Studies (IECS) University of Hull, 2013) (TIDE toolkit⁵); and
- other non-quantitative impacts e.g. from lighting on invertebrates or plants - professional judgement.

2.5 In response to FWQ 1.11.5(a), NE confirmed [REP1-074] that all relevant sites and qualifying features had been identified and considered by the Applicant in its HRA report.

HRA Matters Considered During the Examination

2.6 As detailed further in Sections 3 and 4 of this RIES, the Applicant's screening assessment in the initial HRA Report [APP-060] concluded that the Proposed Development would have no LSE, either alone or in-combination with other projects or plans, on the qualifying features of the Thames Estuary and Marshes SPA and Ramsar site.

2.7 However, the Applicant's conclusions were disputed by NE during examination, with the following key matters discussed:

- potential impacts considered;
- zone of influence of potential impacts;
- the value/importance of functionally-linked land and disturbance to birds utilising it;
- mitigation;
- ruling out of LSE (alone); and
- in-combination effects.

2.8 As a result of these concerns raised by NE during the examination, the Applicant revised its assessment with the acknowledgement that some

⁵ Waterbird Disturbance Mitigation Toolkit (Institute of Estuarine & Coastal Studies (IECS) University of Hull, 2013)

potential impacts could result in LSE on some features of the European sites [REP4-018 and REP5-032]⁶.

- 2.9 Further details of matters discussed during examination are provided in Sections 3 and 4 of this RIES.

Matrices

- 2.10 The Applicant provided screening matrices within the initial HRA Report [APP-060]. Following the Applicant's acknowledgement of LSE, the screening matrices were revised in the HRA Stage 2 Report [REP4-018] and integrity matrices were also provided for the features and impacts where the Applicant had acknowledged the potential for LSE. These were further updated at Deadline 5 [REP5-032].
- 2.11 The matrices provided in the HRA Stage 2 Report addressed a number of the matters which are detailed in Sections 3 and 4 of this RIES. Nonetheless, discussion of these matters is included in the RIES to provide the background on examination discussions up to the point of the Applicant's submission of the updated matrices.
- 2.12 NE has not yet confirmed whether it is content with the Applicant's revised screening matrices and integrity matrices provided in the HRA Stage 2 Report [REP4-018], nor of course the update provided at Deadline 5.
- 2.13 This RIES includes the ExA's versions of the screening and integrity matrices (Annexes 2 and 3). These are based on those in the Applicant's updated HRA Stage 2 Report [REP5-032], modified in a number of ways including whether or not NE has agreed with the conclusions, and taking into account matters discussed up to Deadline 5. NE is invited to comment on the matrices in response to the consultation on this RIES.

⁶ The European sites considered in the HRA Stage 2 Report [REP4-018] and the updated HRA Stage 2 Report [REP5-032] remained the same as the initial HRA Report [APP-060].

3. LIKELY SIGNIFICANT EFFECTS

- 3.1 This section of the RIES provides a summary of the HRA matters considered during the examination up to Deadline 5 (6 July 2018).
- 3.2 The Applicant's initial conclusion of no LSE, either alone or in-combination with other projects or plans, on the qualifying features of the Thames Estuary and Marshes SPA and the Thames Estuary and Marshes Ramsar site [APP-060] was disputed by NE, as the statutory nature conservation body, during the examination. NE stated that it was unable to agree to the conclusion of no LSE alone or in-combination with other plans or projects (response to FWQ 1.11.8 [REP1-074]). NE's primary concerns were discussed during the examination and led to the outcome explained below.

Potential impacts

- 3.3 Chapter 5 of the Applicant's initial HRA Report [APP-060] identified impacts with the potential to give rise to significant effects on the European sites and on functionally linked features. These included:
- changes to air quality – from road, non-road and shipping emissions;
 - changes to existing coastal and estuarine processes (sediment circulation and deposition patterns) – from construction of marine structures, capital and maintenance dredging;
 - changes to water and/or sediment quality within the Thames - from construction of marine structures, capital and maintenance dredging; and
 - disturbance from increased shipping, noise, lighting and human activity;
 - loss of saltmarsh or intertidal mudflat habitat which is functionally linked to the European sites; and
 - in-combination impacts.

Adequacy of impacts assessed

- 3.4 Section 4.2 of NE's written representation [REP1-074] raised points of detail about the potential impacts assessed within the initial HRA Report. These included comments regarding a shortfall in the assessment of:
- water and/or sediment quality;
 - disturbance from shipping;
 - disturbance from noise and lighting; and
 - impacts with the potential to give rise to effects on functionally linked features.

3.5 The Applicant [REP2-007] was of the view that the initial HRA Report had adequately addressed these matters and requested clarification from NE as the perceived shortfall. No formal response has been received from NE in this regard.

Additional impacts

3.6 In response to FWQ 1.11.5(b), NE stated that the following potential impacts also needed to be considered to satisfy the requirements of HRA [REP1-074]:

- invasive non-native species (INNS);
- construction waste and pollutants; and
- operational waste and pollutants.

3.7 The Applicant [REP2-007] advised that these matters were already addressed within the ES, however for completeness, assessed these potential impacts in the HRA Stage 2 Report [REP5-032].

Zone of influence of potential impacts

3.8 Section 5.3 of the initial HRA Report [APP-060] summarised the maximum extent of the potential impacts. It stated that a zone of influence extending up to 300m from the Proposed Development was used to inform the assessment and represents the worst case approach for the majority of potential impacts. NE disagreed with this position and considered in its response to FWQ 1.11.3 [REP1-074] that the zones of influence for the potential impacts had not been clearly identified in the initial HRA Report and were not sufficiently precautionary.

3.9 The Applicant responded to these points in FWQ 1.11.3 [REP1-016], and in Table 3 of the HRA Stage 2 Report [REP5-032] subsequently applied a larger zone of influence for: air quality impacts from shipping; noise/lighting/movement disturbance associated with increased shipping traffic along the Thames navigable channel; and sediment mobilisation and redeposition from the proposed marine works and dredging.

3.10 In respect of air quality study areas for ecological receptors, Table 1 of the HRA Stage 2 Report [REP5-032] clarified the air quality study areas for construction dust; operational dust; road traffic emissions; rail emissions and shipping emissions.

3.11 Further to the submission of the HRA Stage 2 Report [REP4-018 and REP5-032], NE did not make any specific representations concerning the revised study areas.

Bird disturbance

- 3.12 In respect of disturbance to birds, the HRA Report [APP-060] stated that the maximum zones of influence (300m) had been defined utilising the TIDE toolkit⁵.
- 3.13 NE raised concerns that these zones of influence were not sufficiently precautionary, citing recent experience of piling activity at the adjacent Goshems Farm jetty which suggested that SPA birds had been displaced in significant numbers from a distance beyond 300m (response to FWQ 1.11.8 [REP1-074]). NE also noted that 'the zone of disturbance to birds' is likely to differ between species and type of impact (i.e. lighting, noise and human activity). At Deadline 3, NE [REP3-042] stated that the proposed '300 metre zone' may not be sufficient to adequately safeguard the non-breeding birds and *"is also unlikely to be relevant for a number of development effects (e.g. alterations to hydrodynamics & sediment regime, risk of pollution by displacing contaminated sediment, changes to port vessels etc) which may all have an impact on the foraging bird population across a wider area of relevance"*.
- 3.14 The Applicant [REP2-007] argued that the zone of influence of disturbance to birds drew upon widely accepted and adopted research (i.e. the TIDE toolkit⁷) and that the envelope was defined by reference to the maximum response distances of the relevant species. It acknowledged that some species would be less prone to disturbance than others, but considered its approach to represent a 'worst case'. The Applicant also [REP2-007] queried the evidential basis upon which NE was asserting bird disturbance from Goshems Farm jetty piling works manifested at distances >300m from the source.
- 3.15 At Deadline 5, NE [REP5-061] reiterated that the zone of influence of disturbance to birds is not sufficiently evidenced or precautionary. It noted that Table 17.30 of the ES [APP-060] identifies that at a distance of 300m some construction activities would remain above 60 decibels. NE stated that according to the TIDE toolkit, this would fall within the highest risk category for bird disturbance.
- 3.16 NE further stated that the bird disturbance at Goshem's Farm noted at a distance considerably greater than 300m was a field observation by an experience professional rather than a scientific study and that further details such as decibel readings are not available. However, it considered the observation was significant as it relates to the environment in the Proposed Development would take place. It noted the TIDE toolkit distances are 'rules of thumb' and should be used for initial high level planning, not detailed impact assessment.

⁷ The sensitivity of SPA qualifying features and Ramsar site Criterion 6 species to noise/construction and human disturbance, based on the TIDE toolkit, was provided in Table 2 of the HRA Stage 2 Report [REP5-032].

- 3.17 NE also cited previous assessment work using a 500m zone of influence, such as a report produced in 2011 for Tilbury Power Station.
- 3.18 NE noted [REP5-061] that the 300m disturbance zone of influence was used in the in-combination assessment, and NE's concerns therefore also apply to that.
- 3.19 At the time of publication of this RIES, disagreement remained between the Applicant and NE regarding the zones of influence used to assess noise disturbance to ornithological features of the SPA and Ramsar site.

Value/importance of 'functionally-linked' intertidal habitat

- 3.20 The Applicant's initial HRA Report [APP-060] stated that "*significantly less than 1% of the SPA/Ramsar Site population is involved in use of intertidal habitats*" and concluded that "*taking into account the type of use (e.g. no high tide roosting), and the likely spatial and temporal extent of potential disturbance, based on outputs from noise and vibration predictions (ES Chapter 17) and predicted Lux contours based on the Lighting Strategy (ES appendix 9.J), there is not assessed to be any scope for LSE on the SPA/Ramsar Site*".
- 3.21 NE's relevant representation [RR-025] raised concerns over disturbance impacts on wintering and passage birds from the Thames Estuary and Marshes SPA that use the intertidal area within the Tilbury2 application site as supporting habitat. NE considered that the mild winter weather at the time of the Applicant's wintering bird survey may have led to under-recording of bird numbers and species using the intertidal area. NE also considered that the initial HRA Report undervalued (ecologically) functionally-linked habitat (response to FWQ 1.11.8 [REP1-074]) and noted [REP1-074, REP3-042 and REP4-008] that case law⁸ has established that functionally-linked land should receive equivalent protection to the designated sites.
- 3.22 NE [RR-025] suggested that as a result, and in applying the precautionary principle, the Applicant should commit to annual bird surveys between 01 September to 31 March during construction and operation of the Proposed Development. NE suggested that where an impact is noted, it should be contacted so that appropriate mitigation measures could be implemented within agreed timeframes.
- 3.23 In response to NE's concerns, the Applicant provided NE with a note on wintering bird use of the intertidal area (Appendix 7 of [AS-049]) which, it argued, corroborated the findings of its initial surveys. The Applicant disputed that the foreshore habitat had been undervalued [REP2-007], but nonetheless undertook additional wintering bird surveys in February and

⁸ RSPB and others v Secretary of State and London Ashford Airport Ltd [2014 EWHC 1523 Admin]

March 2018 to provide further data. The results of these surveys were incorporated into a revised 'Bird Note', which was submitted at Deadline 3 (Appendix 2 of [REP3-029])⁹.

- 3.24 At Deadline 3, NE confirmed [REP3-042] that it had reviewed the latest version of the Bird Note, but did not agree with its conclusion. NE stated that additional data exists (from sources other than the Applicant), which indicates that the area of foreshore contiguous with the Thames Estuary and Marshes SPA has supported significant numbers of over-wintering (and/ or passage) bird species and that recent development has caused a reduction in bird usage of the area in proximity of the Tilbury2 project. NE considered the importance of non-breeding bird interest within the Applicant's '300m impact zone' to be more significant than indicated by the Applicant. NE stated that it could not rule out a LSE and confirmed that it still considered annual bird surveys to be appropriate [REP3-042].
- 3.25 In the updated HRA Stage 2 Report [REP5-032], the Applicant acknowledged that a LSE could not be ruled out and considered disturbance to birds using functionally linked land from construction within the Stage 2 assessment. Further details are provided in Section 4 of this RIES.

Mitigation and likely significant effects

- 3.26 The Applicant's initial HRA Report [APP-060] explained that embedded mitigation is proposed to reduce the spatial influence of effects, as described in the ES. It also explained that the following plans have been produced and taken into account in the assessment:
- Construction Environmental Management Plan (CEMP) [APP-163]¹⁰;
 - Operational Management Plan (OMP) [APP-165]¹¹;
 - Lighting Strategy [APP-044]; and
 - Drainage Strategy [APP-090].
- 3.27 The Applicant's response to FWQ 1.11.1 [REP1-016] confirmed which mitigation measures had been relied upon to reach the conclusion of no LSE and how these were secured. In addition to measures included within plans/strategies detailed above, this included:
- cowling/shields on site and jetty lighting;
 - noise barriers; and

⁹ The Bird Note was included in the HRA Stage 2 Report [REP4-018] at Appendix 9

¹⁰ The CEMP was updated during the examination, firstly at Deadline 1 [REP1-006] and secondly at Deadline 3 [REP3-011]

¹¹ The OMP was updated at Deadline 1 [REP1-008]

- sediment sampling to identify contaminants prior to maintenance dredging.
- 3.28 As noted above in this RIES, NE stated at Deadline 1 that it did not agree with the Applicant that a LSE could be ruled out for the Proposed Development alone (response to FWQ 1.11.8 [REP1-074]). NE reiterated this position at Deadline 3 [REP3-042], with reference also made to a ruling by the Court of Justice of the European Union (the CJEU) on the interpretation of the Habitats Directive in the case of *People Over Wind and Sweetman vs Coillte Teoranta* (2018). This judgement ruled that it is not appropriate to take into account measures intended to avoid or reduce the harmful effects of the plan or project at the screening stage. NE considered that this ruling "*signals a presumption in favour of Appropriate Assessment, and that mitigation measures require further scrutiny*".
- 3.29 In response, the Applicant's updated HRA Stage 2 Report [REP5-032] confirmed that the mitigation measures were relied upon in the assessment of effects on integrity (i.e. a 'Stage 2' assessment). An overview of the discussions regarding the sufficiency of this mitigation is provided in Section 4 of this RIES.

In-combination effects

- 3.30 The Applicant addressed potential in-combination effects within sections 5.3 and 7.3 of the initial HRA report [APP-060]. The following projects (as listed in Table 2.2 of the ES [APP-031]) were considered by the Applicant in the in-combination assessment:
- Thames Enterprise Park;
 - Oikos Storage Proposals;
 - Goshems Farm Jetty;
 - Land adjacent to Tilbury Power Station Forth Road; and
 - West Thurrock Biomass CHP.
- 3.31 The initial HRA Report [APP-060] concluded that there would be no LSE for the Proposed Development in-combination with other plans or projects.
- 3.32 NE first raised concerns over in-combination effects in its relevant representation¹² [RR-025]. As noted above in this RIES, NE explained there is some evidence that construction works approximately 800m downstream from the Proposed Development (at Goshems Farm jetty) are causing disturbance to the waterbird assemblage of the Thames Estuary and Marshes SPA. It considered that construction of the Proposed Development and other projects in the area may extend the disruption for

¹² As distinct from several other interested parties who raised similar concerns in relation to cumulative effects in relation to the Environmental Impact Assessment

years to come. As such, NE did not consider the Applicant's in-combination assessment was sufficiently precautionary and therefore it did not agree with the Applicant's conclusion of no LSE for the Proposed Development in-combination with other plans or projects. This position was reiterated at Deadline 3 [REP3-042].

- 3.33 The Applicant's updated HRA Stage 2 Report [REP5-032] concurred with the potential for LSE for the Proposed Development in-combination with other plans or projects. The matters discussed during the examination relating to in-combination impacts are therefore detailed in Section 4 of this RIES.

The HRA Stage 2 Report screening conclusions

- 3.34 The Applicant's updated HRA Stage 2 Report [REP5-032] concluded that LSE on the Thames Estuary and Marshes SPA and Ramsar site could be excluded for:

- construction or operational phase disturbance (from lighting, human disturbance, noise or shipping traffic) to any qualifying interest bird species using habitats within the SPA and/or Ramsar site designation boundaries;
- construction or operational phase disturbance to hen harrier or knot using functionally linked habitat outside the designation boundaries; and
- operational phase disturbance to qualifying interest bird species using functionally linked habitat outside the designation boundaries.

- 3.35 The updated HRA Stage 2 Report [REP5-032] concluded that LSE on the Thames Estuary and Marshes SPA and Ramsar site could not be excluded for:

- damage to habitats within the SPA and/or Ramsar Site from:
 - temporary or permanent minor changes in estuarine processes;
 - temporary changes in water quality;
 - temporary or permanent changes in air pollution (construction or operational phase);
 - construction/operational waste and pollutants; and
 - risk of introduction of INNS.
- direct loss or damage to functionally linked habitats outside the SPA and Ramsar Site and more proximal to the Tilbury2 site from the same sources, with possible consequences for bird populations associated with the SPA, and bird, flora and invertebrate fauna associated with the Ramsar Site;

- disturbance or damage to habitats within the SPA and/or Ramsar Site or to functionally linked habitats outside the designation boundaries in combination with other consented or planned projects.

Screening conclusions

- 3.36 The ExA's understanding of the Applicant's screening exercise and any relevant views of NE up to Deadline 5 are presented in the ExA's screening matrices in Annex 2 of this RIES. All Interested Parties are invited to comment on the accuracy of the content of the screening matrices.
- 3.37 NE has not confirmed whether or not it agrees with the conclusions of the Applicant's screening exercise and is invited to set out its views on the conclusions within its consultation response to the RIES.

4. ADVERSE EFFECTS ON INTEGRITY

Conservation Objectives

- 4.1 The conservation objectives for Thames Estuary and Marshes SPA and the Thames Estuary and Marshes Ramsar Information Sheet were provided in Appendices 3 and 4 of the updated HRA Stage 2 Report [REP5-032].

The Integrity Test

- 4.2 The Applicant's updated HRA Stage 2 Report [REP5-032] concluded that the project would not adversely affect the integrity of the Thames Estuary and Marshes SPA or the Thames Estuary and Marshes Ramsar site.
- 4.3 Table 5 of the updated HRA Stage 2 Report [REP5-032] detailed the mitigation and monitoring measures that were relied upon to reach this conclusion, along with details of where these measures are secured in the draft DCO/DML.
- 4.4 Throughout the examination, a number of matters were discussed regarding the assessment of effects on integrity of the European sites. These matters are detailed below.

Disturbance to birds utilising functionally-linked habitat

- 4.5 As noted in Section 3 of this RIES, the Applicant's updated HRA Stage 2 Report [REP5-032] acknowledged a LSE resulting from disturbance to qualifying features of the Thames Estuary and Marshes SPA and Ramsar Site utilising functionally linked land. The report subsequently concluded that there would be no adverse effects on integrity resulting from disturbance. This was based on piling being time-limited, the extent of functionally linked habitat available to temporarily displaced birds and the worst-case approach that had been assessed (see footnote a in Annex 3 of this RIES).
- 4.6 However, to provide reassurance on the issue of construction noise, the Applicant committed to continuing wintering and passage bird surveys (covering September to April) throughout the key noise-generating phases of construction. These surveys would be secured through a Bird Monitoring and Action Plan (BMAP) [REP5-031] which would include trigger levels for more intense monitoring and notification of key stakeholders and would require the Applicant to temporarily cease disturbing activities which are implicated in significant effects. The Applicant stated that the monitoring is not relied upon to reach the conclusion of no adverse effects on integrity and is akin to the type of

routine post-construction monitoring for verification purposes [REP5-032 and REP5-036].

- 4.7 The Applicant has not confirmed if or how delivery of the BMAP would be secured.
- 4.8 However, at Deadline 5 NE [REP5-061] stated that monitoring can be useful as an added precaution where no adverse impact is anticipated. NE also stated that it did not agree to no adverse effect on integrity on the European sites and therefore is unable to advise further on the matter. The ExA infers that NE's position results from its disagreement over the value of functionally linked land and the zones of influence of noise disturbance, as described in Section 3 of this RIES. Confirmation of this from NE is requested.

Sufficiency of mitigation

Mitigation for habitat loss of functionally linked land

Coastal saltmarsh or intertidal mudflats

- 4.9 The initial HRA Report [APP-060] stated that the marine elements of the Proposed Development could impact upon saltmarsh and mudflat (within the application site) which are a continuation of the habitats present within the European sites; this could have implications for wading birds and waterfowl and insect and plant taxa of the European sites.
- 4.10 The initial HRA Report noted that "*any loss of saltmarsh or intertidal mudflat habitat would denude the local extent within and around the European Site and may have implications for carrying capacity and/or pressure on the surviving examples within the European Site*". However, it further stated that coastal saltmarsh would be retained (paragraph 7.2.5) and no specific reference was made to the loss of intertidal mudflats. Table 10.49 of the ES [APP-031] also stated that there would be no loss of coastal saltmarsh or intertidal mudflats. The initial HRA Report therefore concluded no LSE from the loss of functionally linked land.
- 4.11 However, the Applicant subsequently confirmed (response to FWQ 1.11.6 [REP1-016] and [REP5-032]) that there would be a temporary loss of 0.035ha of intertidal habitat (comprising 255.1m² of intertidal mudflat and 99.4m² of coastal saltmarsh), the locations of which were shown in Appendix A of [REP1-016].
- 4.12 At Deadline 5, the updated Stage 2 HRA Report [REP5-032] concluded a LSE from the loss of functionally linked saltmarsh and intertidal mudflat habitats. However, it ultimately concluded no adverse effect on integrity, taking into account the proposed habitat provision (see footnote b of Annex 3). Specific details of the habitat provision were not provided.

- 4.13 The ExA notes that the LEMP [REP1-010] (secured by requirement 11 of the draft DCO [REP5-044]) confirmed that intertidal habitats would be addressed within the EMCP. The draft EMCP [REP5-041] confirmed that *"Proposals to create new saltmarsh and mudflat habitat within the Order Limits to off-set the minor losses (e.g. to outfall construction) in the medium-long term have been agreed in principle with the Environment Agency...The detailed design of the mitigation will be determined in consultation with the Environment Agency, pursuant to their protective provisions within the DCO."*
- 4.14 The Environment Agency [REP5-055] confirmed that it accepted, in principle, the Applicant's proposed mitigation in regards to intertidal habitat. However, the EMCP is not a certified document within the draft DCO [REP5-061] and the EA noted the EMCP must be secured, ideally with a version that can be certified by the Secretary of State. It is appreciated that if the EMCP is agreed before the end of the examination, the Applicant intends to secure it through requirement 5 of the draft DCO [REP5-046].
- 4.15 NE has not specifically commented about the proposed on-site habitat provision for the loss of this functionally linked habitat, and is invited to set out its views in the context of the Habitats Regulations in its response to the RIES.

Coastal and floodplain grazing marsh

- 4.16 In respect of functionally linked habitat loss for Ramsar invertebrates, paragraph 7.2.5 of the Applicant's initial HRA Report [APP-060] stated that *"a combination of on-site and geographically relevant off-site compensation is proposed to ensure no net loss of Thames Estuary grazing marsh habitats and associated ditch systems This should ensure no effect on the Ramsar populations by virtue of any functional linkage"*. No further details of the habitat provision were provided within the HRA Report, however reference was made to Chapter 10 of the ES which set out the quantities of habitat to be lost, retained and replaced (see Table 10.49 [APP-031]).
- 4.17 NE (response to FWQ 1.11.8 in [REP1-074] and [REP3-042]) considered that the mitigation proposed for the loss of functionally linked habitats that support a number of Thames Estuary and Marshes Ramsar site listed invertebrates and plants was not adequate.
- 4.18 The updated Stage 2 HRA Report [REP5-032] confirmed that 3.5ha of coastal and floodplain grazing marsh functionally linked habitat would be lost¹³ and concluded that this would result in a LSE. As noted in footnote b of Annex 3 of this RIES, the Applicant's integrity matrices [REP5-032] did

¹³ [REP2-007] confirmed that 3.4ha would be permanently lost, and 0.1ha would be temporarily lost

not directly address the loss of coastal and floodplain grazing marsh functionally linked land. However, the Applicant's screening matrices [REP5-032] referred to Chapter 10 of the ES [APP-031] and the draft EMCP [REP5-041] for details of on-site and off-site habitat provision proposed to ensure no net loss of the Priority habitat¹⁴.

- 4.19 The LEMP [REP1-010] stated that coastal and floodplain grazing marsh would be newly created on-site (as per Figure 10.13 of the ES [APP-031]), with details of its construction to be set out in the EMCP¹⁵.
- 4.20 Section 8 of the draft EMCP [REP5-041] provided details of the proposed restoration of the 0.1ha of coastal and floodplain grazing marsh to be temporarily lost on-site. Section 9 provided details of the proposed provision of 30-37ha of coastal grazing marsh off-site at Paglesham, Essex to mitigate the permanent losses.
- 4.21 Off-site habitat provision has been discussed throughout the examination. The EA stated that the Paglesham site could in principle provide suitable compensation for coastal grazing marsh [REP3-034] and at Deadline 5 the Applicant [REP5-036] stated that the EA was satisfied with the EMCP¹⁶.
- 4.22 NE confirmed [REP5-061] that it has not made representations on coastal grazing marsh. However, NE is invited to set out its views on the proposed habitat provision in the context of the Habitats Regulations in its response to the RIES.

Mitigation for disturbance to SPA and Ramsar birds from piling noise and dredging

- 4.23 The Applicant's initial HRA Report [APP-060] concluded no LSE from noise disturbance and dredging to SPA and Ramsar birds, and no mitigation measures were proposed.
- 4.24 However, NE [REP1-074 and REP3-042] did not agree with the Applicant's conclusions in this regard, due to a combination of the undervaluing of the value/importance of the functionally linked land and insufficiently precautionary zones of influence (as detailed in Section 3 of this RIES). Therefore, NE suggested that avoidance of piling between September and end of March was required to mitigate noise impacts on SPA and Ramsar birds. The Applicant [REP2-007] stated that "*activity-specific requirements from NE such as additional validation monitoring, can be accommodated within the Construction Method Statement*", which needs to be consulted

¹⁴ Note this habitat provision was proposed for the loss of this Priority habitat as a whole, not just for that considered to be functionally linked to the SPA/Ramsar site.

¹⁵ The LEMP only deals with habitat aftercare and management (paragraph 3.1 of [REP1-010]).

¹⁶ The EA's Deadline 5 representation itself [REP5-055] did not specifically reference the proposed coastal grazing marsh habitat provision.

upon with NE by the Applicant prior to the submission of it to the MMO under the terms of the DML.

- 4.25 In relation to disturbance from dredging, NE [REP1-074 and REP3-042] suggested that careful design and programming of dredging operations would be required to avoid disturbance to birds between September and end of March. The Applicant [REP2-007] did not consider additional mitigation measures to be necessary, as the MMO could impose controls on dredging through conditions of the DML.
- 4.26 The HRA Stage 2 Report [REP5-032] concluded that disturbance from piling noise and dredging could result in a LSE to SPA and Ramsar birds; however, it ruled out an adverse effect on integrity (see Annex 3 of this RIES). NE [REP5-061] did not explicitly state whether it agreed with the Applicant's conclusion of no adverse effect on integrity from disturbance to SPA and Ramsar birds from piling noise and dredging for the project alone. However, as noted in Section 3 of this RIES, NE did not agree with the value of the functionally linked land and the zones of influence applied by the Applicant.
- 4.27 Despite this, no further representations have been made with regard to the piling and dredging restrictions suggested above.

Mitigation for impacts to functionally-linked intertidal habitats supporting SPA and Ramsar site features from dredging (remobilisation of contaminants and sediment plumes)

- 4.28 NE [REP1-074 and REP3-042] stated that the appropriate design and methodology of dredging (yet to be defined, agreed and permitted) would require careful programme timing to avoid increasing the presence of contaminated sediments to invertebrate prey and birds foraging during the Autumn – end March period (which includes ringed plover autumn passage). NE further suggested that in the absence of detailed dredging methodology, a precautionary restriction on capital dredging between July and April should be implemented to allow for sediment to settle and disperse, before overwintering and autumn passage birds visit the area.
- 4.29 The Applicant [REP2-007] considered that its commitment to use backhoe dredging for those areas of the river bed where high levels of contaminants were found provided mitigation against potential increases in contaminated sediments. It confirmed that this had been agreed with the MMO and would form part of the approval of method statements under the DML [REP2-007]. The Applicant also stated (response to 2.8.47 in [REP4-020]) that the sediment plume from water injection dredging (WID) is predicted to be confined mostly to the subtidal areas with limited increase in suspended sediment concentration or sediment accumulation on the intertidal areas (the area functionally linked to the overwintering

birds); and that sediment modelling concluded restricting dredging to ebb tide would limit landward extent of any influence of dredging. The Applicant ultimately concluded no adverse effects to functionally linked 'land (see footnote b of Annex 3) and as such, dredging restrictions were not deemed necessary by the Applicant.

- 4.30 No further references to the need for dredging restrictions were made by NE.

Additional mitigation

- 4.31 NE noted [REP1-074 and REP3-042] that measures for water discharges, construction waste and pollutants, and INNS were detailed in application documents other than the initial HRA Report (i.e. the ES and the OMP). However, it considered that these should be clearly set out within the HRA in order to demonstrate compliance with the Habitats Regulations.
- 4.32 At Deadline 2, the Applicant [REP2-007] agreed to update the HRA Report to incorporate these measures. Measures for INNS have been included within the Applicant's integrity matrices [REP5-032], although measures for water discharges, construction waste and pollutants have not been specified.
- 4.33 NE [REP1-074 and REP3-042] also suggested that additional mitigation measures were required to manage surface water pollution, in order to comply with best practice. No mitigation measures have been explicitly identified in the updated HRA Stage 2 Report [REP5-032].

In-combination effects

- 4.34 The potential for in-combination impacts from the Proposed Development together with the Lower Thames Crossing (LTC) and the Tilbury Energy Centre (TEC) was a significant matter discussed during the examination. The LTC and TEC are discussed separately below.

Lower Thames Crossing

- 4.35 The Applicant's initial HRA Report [APP-060] did not consider potential in-combination effects with LTC. However, a Scoping Report for LTC was received by the Inspectorate on 2 November 2017¹⁷, during the acceptance period for Tilbury2. The Inspectorate issued post-acceptance section 51 advice [PD-003] advising the Applicant to provide an assessment of cumulative effects associated with the proposed LTC for the purposes of the ES¹⁸. Although in-combination effects were not specifically

¹⁷ <https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing/?ipcsection=docs>

¹⁸ Note that section 51 advice was issued with respect of cumulative effects for the ES

mentioned in the advice, it is logical that there is consistency between the two assessments.

- 4.36 In the FWQs, the ExA requested the Applicant to respond to NE's relevant representation concerns regarding in-combination effects (FWQ 1.11.1 of [PD-007]) and specifically requested an in-combination assessment with LTC (FWQ 1.7.1 of [PD-007]).
- 4.37 In response, the Applicant referred to its Response to Relevant Representations document [AS-049]. Whilst this document was drafted primarily in relation to cumulative effects for the purposes of Environmental Impact Assessment, it explained the Applicant's view that there is currently a large amount of uncertainty in relation to the impact of LTC on the highway network and the environment in the vicinity of the Proposed Development. It noted that there is unlikely to be a significant temporary overlap in the major construction works required for the two schemes. The Applicant considered "*it is not possible to make any reasonable assessment of future highway conditions if LTC is implemented, nor undertake even high level qualitative assessment of the impact of this traffic on environmental matters such as air quality, noise, ecology and heritage. Nor is the physical form of the proposals sufficiently clear at the present time to undertake any meaningful assessment*". The Applicant further considered that it was for the promoter of the LTC to undertake the cumulative assessment. This position was reiterated by the Applicant at Deadline 1 [REP1-016], the ISH on 18 April 2018 and at Deadline 3 [REP3-029].
- 4.38 As detailed in its written representation, NE [REP1-074] did not agree that LTC should be excluded from the in-combination assessment. NE noted the potential for LTC to impact on the intertidal area of the Thames Estuary near the proposed Tilbury2, which contains habitats functionally-linked to the Thames Estuary and Marshes SPA and Ramsar site. NE highlighted the potential for impacts from Tilbury2 and LTC to overlap and/or occur in successive years; explaining that this could have implications for the Thames and Estuary Marshes SPA and Ramsar site, including the capacity to achieve favourable condition status.
- 4.39 Although the Applicant had set out reasons why a cumulative assessment of the Proposed Development taking into account LTC and TEC was not possible [AS-049, REP1-016 and REP3-029], it presented a largely qualitative assessment of in-combination effects with both projects at Deadline 3 [REP3-027]. This document stated that construction of the LTC would not commence until after the currently estimated first operation of Tilbury2; therefore in-combination effects impacts would be in respect of the operational phase of Tilbury2.

- 4.40 In relation to impacts on statutory designations, the assessment [REP3-027] used information from the LTC pre-consultation Part One Appropriate Assessment¹⁹. It identified the following impacts as having the “*greatest potential to generate a significant cumulative effect*”:
- air quality impacts from additional traffic emissions; and
 - disturbance to wading bird interest features of the SPA/Ramsar site from the construction phase of LTC combining with operational-phase impacts from Tilbury2.
- 4.41 This was reflected in the HRA Report [REP4-018] which considered in-combination effects at Stage 2.

Tilbury Energy Centre

- 4.42 At the time of the DCO application for the Proposed Development, a Scoping Report had not been submitted for TEC. The Applicant’s initial HRA Report [APP-060] did not consider potential in-combination effects with TEC.
- 4.43 NE first commented on potential interactions with the proposed TEC (which is located on the site of the former Tilbury B power station) in relation to the cumulative effects assessment within the ES [RR-025]. NE further queried the Applicant’s exclusion of TEC from the HRA in-combination assessment, citing concerns relating to non-breeding bird features in its written representation [REP1-074]. However, specific details of these concerns were not provided.
- 4.44 In its Responses to Relevant Representations [AS-049] the Applicant highlighted the lack of available details about TEC, that construction programmes would be unlikely to overlap and that it considered it was for TEC to consider Tilbury2 in its cumulative effects assessment.
- 4.45 At Deadline 1, the Applicant remained of the view that it was not for the Applicant to consider the cumulative effects with TEC, but nonetheless provided a high level assessment of cumulative effects with TEC in Appendix C of Applicant’s response to FWQs [REP1-016]. This took into account additional information available from non-statutory consultation undertaken in relation to the TEC. With regards to statutory designations, Appendix C confirmed that no HRA information was available for TEC. However, it acknowledged that potential impacts from TEC could be air quality changes, disturbance to SPA/Ramsar birds, temporary loss of functionally linked land and hydrogeological changes.

¹⁹ Highways England (January 2016). Lower Thames Crossing. Pre-Consultation Scheme Assessment Report. Volume 6: Environmental Appraisal. (Ref: HA540039-HHJ-ZZZ-REP-ZZZ-010)

4.46 At Deadline 3, further to publication of the TEC Scoping Report²⁰, the Applicant [REP3-027] confirmed that there was still no HRA information available for TEC. However, as noted above, it presented a largely qualitative assessment of in-combination effects with both TEC and LTC [REP3-027] and identified the following potential impacts from TEC on the Thames Estuary and Marshes SPA and Ramsar site:

- increased concentrations of oxides of nitrogen (NOx) and nitrogen deposition;
- bird disturbance during construction;
- temporary loss of functionally linked habitat; and
- other impacts on functionally-linked habitat including displacement/removal of benthos, suspended sediment, release of chemicals, changes to hydrodynamics and water discharge/thermal plume.

4.47 The potential impacts from TEC as identified by the Applicant were reflected in the HRA Stage 2 Report [REP5-032], however were not specifically assessed.

HRA Stage 2 Report conclusions

4.48 The integrity matrices submitted as Appendix 11 of the updated HRA Stage 2 Report [REP5-032] considered the following potential in-combination effects:

- disturbance to birds;
- direct loss and damage to habitats within the designated site and to functionally linked habitat outside the designation boundary;
- INNS;
- effects on sediment circulation processes and water quality.

4.49 The Applicant's integrity matrices concluded that there would be "*no credible risks of significant in-combination effects having adverse consequences for the integrity of the European/Ramsar Site*".

NE's response

4.50 NE [REP5-061] stated that it is not able to agree that there would not be an adverse effect on integrity. Specifically, it was "*unconvinced by the applicant's position that further more detail Cumulative Effect Assessment is not possible at this time due to lack of information and considers that further consideration is required to address uncertainties relating to the significance of habitat value, sedimentation and pollution risk and disturbance of SPA birds*".

²⁰ Received by the Inspectorate on 16 April 2018

- 4.51 NE further stated [REP5-061] that *"it remains of the view that significant information is available for this development and adjacent sites and that some level of quantitative assessment should be possible"*. NE has not so far provided details of what it considers this additional information to comprise. Similarly, in concluding that it is unlikely common ground will be reached on which projects should be scoped into the in-combination assessment, NE has not set out specific disagreements.
- 4.52 NE [REP5-061] noted that the HRA Stage 2 Report in-combination assessment was limited to overlapping impacts²¹ and that consideration should be given to prolonged disturbance to functionally linked land caused by progressive development. It suggested displacement effects caused by successive projects should be assessed.
- 4.53 In relation to in-combination air quality impacts, NE noted that the concentrations and deposition rates identified are relatively small. However, it considered that the HRA needs to consider its contribution in light of the Wealden Judgement²².
- 4.54 At the time of publication of this RIES, these disagreements remained between the Applicant and NE.

Integrity test conclusions

- 4.55 As noted above, the Applicant's overall conclusion of the HRA Stage 2 assessment is that the Proposed Development would not adversely affect the integrity of the Thames Estuary and Marshes SPA and Ramsar site, either alone or in combination with other plans or projects. NE has stated that it does not agree with this conclusion.
- 4.56 The ExA's understanding of the Applicant's conclusions of the HRA Stage 2 assessment and NE's views are presented within the integrity matrix in Annex 3 of this RIES.

²¹ Paragraph 6.3.2 of the HRA Stage 2 Report states that *"LTC construction would not commence until after the currently estimated first operation of Tilbury2, and therefore in-combination effects are considered only in respect of the operational phase of the Tilbury2 project"*.

²² Wealden District Council v SSCLG, Lewes District Council & South Downs National Park Authority relating to Habitats Regulation Assessment requirements

5. NEXT STEPS

5.1 All Interested Parties are invited at Deadline 6 to :

- comment on the factual content of this RIES report;
- comment on the accuracy of the content of the stage 1 screening matrices set out in Annex 2;
- comment on the accuracy of the content of the stage 2 integrity matrices set out in Annex 3;
- provide specific responses where requested; and
- provide any information on any discussions that have taken place since Deadline 5.

5.2 As there appears to be a disagreement between the Applicant and NE with regards to the findings of the HRA and in particular the absence of adverse effects on integrity, the Applicant is invited to confirm the extent to which it has considered stages of the HRA assessment process beyond those addressed within the HRA Stage 2 Report, i.e. alternative solutions (Stage 3), and imperative reasons of overriding public interest (Stage 4).

ANNEX 1: POTENTIAL EFFECTS

Potential effects upon the European site(s) which are considered within the submitted HRA report are provided in Table 1.

Table 1: Potential effects considered within the screening and integrity matrices

Designation	Effects described in submission information	Presented in screening matrices as
Thames Estuary and Marshes SPA & Thames Estuary and Marshes Ramsar site	<ul style="list-style-type: none"> • Disturbance (noise and lighting) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (within designated area) • Disturbance (from shipping) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (within designated area) 	<ul style="list-style-type: none"> • Disturbance (within SPA) / Disturbance (within Ramsar site)
	<ul style="list-style-type: none"> • Disturbance (noise and lighting) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (using functionally linked habitats outside designation boundary) • Disturbance (human movement and activity) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (using functionally linked habitats 	<ul style="list-style-type: none"> • Disturbance (outside SPA) / Disturbance (outside Ramsar site)

Designation	Effects described in submission information	Presented in screening matrices as
	<p>outside designation boundary)</p> <ul style="list-style-type: none"> • Disturbance (from shipping) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (using functionally linked habitats outside designation boundary) 	
	<ul style="list-style-type: none"> • Damage (negative changes) to habitats used by cited bird species from changes to sediment circulation or deposition patterns (within designated area) • Damage (negative changes) to habitats used by cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from Tilbury2 site including construction/operational waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation (within designated area) • Damage (negative changes) to habitats used by cited bird species from changes in air quality including from dust, construction waste and pollutants, and exhaust emissions (within designated area) 	<ul style="list-style-type: none"> • Habitat damage (within SPA) / Habitat damage (within Ramsar site)

Designation	Effects described in submission information	Presented in screening matrices as
	<ul style="list-style-type: none"> • Damage (negative changes) to habitats used by cited bird species from introduction or proliferation of invasive non-native species (INNS) (within designated area) 	
	<ul style="list-style-type: none"> • Direct loss of and damage to intertidal habitats used by cited bird species during construction, e.g. of proposed outfall and to grazing marsh habitats from construction of the infrastructure corridor (functionally linked habitats outside designation boundary) • Damage to or loss of habitats used by cited bird species from changes to sediment circulation or deposition patterns (functionally linked habitats outside designation boundary) • Damage (negative changes) to habitats used by cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from Tilbury2 site including construction/operational waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation (functionally linked habitats outside designation boundary) • Damage (negative changes) to habitats 	<ul style="list-style-type: none"> • Loss or damage to functionally linked habitats

Designation	Effects described in submission information	Presented in screening matrices as
	<p>used by cited bird species from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions (functionally linked habitats outside designation boundary)</p> <ul style="list-style-type: none"> • Damage (negative changes) to habitats used by cited bird species from introduction or proliferation of INNS (functionally linked habitats outside designation boundary) 	
	<ul style="list-style-type: none"> • Disturbance (noise and lighting) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (within designated area and using functionally linked habitats outside designation boundary) • Disturbance (from shipping) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species (within designated area and using functionally linked habitats outside designation boundary) • Disturbance (human movement and activity) giving rise to displacement, other behavioural changes or physiological stress responses amongst cited bird species 	<ul style="list-style-type: none"> • In-combination effects

Designation	Effects described in submission information	Presented in screening matrices as
	<p>(using functionally linked habitats outside designation boundary)</p> <ul style="list-style-type: none"> • Damage (negative changes) to habitats used by cited bird species from changes to sediment circulation or deposition patterns (within designated area and functionally linked habitats outside designation boundary) • Damage (negative changes) to habitats used by cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from Tilbury2 site including construction / operational waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation (within designated area and functionally linked habitats outside designation boundary) • Damage (negative changes) to habitats used by cited bird species from changes in air quality including from dust, construction waste and pollutants, and exhaust emissions (within designated area and functionally linked habitats outside designation boundary) 	

Designation	Effects described in submission information	Presented in screening matrices as
	<ul style="list-style-type: none"> • Damage (negative changes) to habitats used by cited bird species from introduction or proliferation of INNS (within designated area and functionally linked habitats outside designation boundary) • Direct loss of and damage to habitats used by cited bird species during construction (functionally linked habitats outside designation boundary) 	
<p>Thames Estuary and Marshes Ramsar site only</p>	<ul style="list-style-type: none"> • Local (Ramsar and wider) population level impacts to Criterion 2 plant/invertebrate species from direct habitat loss and damage to intertidal habitats during construction, e.g. of proposed outfall, and to grazing marsh habitats from construction of the infrastructure corridor • Damage or loss of Criterion 2 plant/invertebrate species from habitat changes arising from changes in air quality (including via construction waste and pollutants) • Damage or loss of Criterion 2 plant/invertebrate species from habitat changes arising from changes in sediment circulation and deposition patterns • Damage or loss of Criterion 2 plant/invertebrate species from 	<ul style="list-style-type: none"> • Loss or damage to Criterion 2 plant/invertebrate species

Designation	Effects described in submission information	Presented in screening matrices as
	<p>changes in water and sediment quality (including via construction/operational waste and pollutants)</p> <ul style="list-style-type: none"> • Physiological stress or behavioural responses in Criterion 2 plant/invertebrate species caused by lighting • Damage or loss of Criterion 2 plant/invertebrate species from introduction or proliferation of INNS 	

ANNEX 2: STAGE 1 SCREENING MATRICES

The European sites included within the screening assessment are:

- Thames Estuary and Marshes SPA; and
- Thames Estuary and Marshes Ramsar site.

Evidence for, or against, likely significant effects (LSE) on the European site(s) and its qualifying feature(s) is detailed within the footnotes that follow the screening matrices. Where a significant effect cannot be excluded, that potential impact source is carried forward to Stage 2 assessment.

Matrix Key:

✓ = LSE **cannot** be excluded

✗ = LSE **can** be excluded

C = construction

O = operation

D = decommissioning

HRA Screening Matrix 1: Thames Estuary and Marshes SPA

Name of European site and designation: Thames Estuary and Marshes SPA															
EU Code: UK9012021															
Distance to NSIP: <i>c.1.5km</i>															
European site features	Likely effects of NSIP														
<i>Effect</i>	<i>Disturbance (within SPA)</i>			<i>Disturbance (outside SPA)</i>			<i>Habitat damage (within SPA)</i>			<i>Loss or damage to functionally linked habitats</i>			<i>In-combination effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Article 4.1 qualifying feature: Avocet (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.1 qualifying feature: Hen Harrier (winter)</i>	xa	xb	xl	xd	xd	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.2 qualifying feature: Ringed Plover (passage)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.2 qualifying feature: Grey Plover (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.2 qualifying feature: Knot (winter)</i>	xa	xb	xl	xe	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.2 qualifying feature: Dunlin (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl

<i>Article 4.2 qualifying feature: Black-tailed Godwit (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.2 qualifying feature: Redshank (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl
<i>Article 4.2 qualifying feature: Total waterfowl (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	✓k	✓k	xl

HRA Screening Matrix 2: Thames Estuary and Marshes Ramsar Site

Name of European site and designation: Thames Estuary and Marshes Ramsar site																		
Ramsar Code: UK11069																		
Distance to NSIP: c.1.5km																		
Ramsar qualifying features	Likely effects of NSIP																	
	Disturbance (within Ramsar site)			Disturbance (outside Ramsar site)			Habitat damage (within Ramsar site)			Loss or damage to functionally linked habitats			Loss or damage to Criterion 2 plant/invertebrate species			In-combination effects		
Effect	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Stage of Development																		
Criterion 2 qualifying feature (nationally rare and scarce plant and invertebrate species)	xi	xi	xl	xi	xi	xl	✓g	✓g	xl	✓h	✓h	xl	✓j	✓j	xl	✓k	✓k	xl
Criterion 5 qualifying feature: Total waterfowl (winter)	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl
Criterion 6 qualifying feature: Ringed Plover (passage)	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl
Criterion 6 qualifying feature: Black Tailed Godwit (passage)	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl
Criterion 6 qualifying feature: Grey Plover	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl

<i>(winter)</i>																		
<i>Criterion 6 qualifying feature: Knot (winter)</i>	xa	xb	xl	xe	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl
<i>Criterion 6 qualifying feature: Dunlin (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl
<i>Criterion 6 qualifying feature: Redshank (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xi	xi	xl	✓k	✓k	xl

Evidence supporting conclusions (note that the same supporting evidence may be referred to for both the SPA and Ramsar site as their extents and boundaries are largely coterminous):

Disturbance (within SPA/Ramsar site)

- a. The distance between the Tilbury2 site and the nearest part of the SPA/Ramsar (foreshore adjoining Eastcourt/Shorne Marshes on the opposite (southern) side of the Thames) is just under 1.5km. The nearest near-shore component (Mucking Flats) is just over 2.4km. The vast majority of both the SPA and Ramsar site is >3km from the Tilbury2 site.

Lighting, human movement and activity: The Applicant considered that such distances alone militate against any LSE on qualifying bird species using the SPA/Ramsar site from visual disturbance emanating from the construction site, or from lighting (on the basis of the information and lux modelling provided in ES Appendix 9.J, in particular the Indicative Lighting Layouts at Appendix B [APP-044], the key figure from which is reproduced within the Applicant’s HRA report).

Noise: The potential magnitude of change in noise is assessed in ES Chapter 17. The implications for ecological receptors are considered in ES Chapter 10. Peak or mean (i.e. 24hr) noise in excess of 55dB is not predicted to be experienced at distances in excess of 300m from the site for most construction or operational activities, with the exception of construction-phase jetty piling and dredging and pavement construction. The foremost of these could see noise levels of 63dB at 300m from source with the latter having the potential to slightly exceed the 55dB level at 300m (ES Chapter 17 Table 17.30 [APP-031]). The Applicant considered that these data indicate that noise levels during construction would not be sufficient to elicit any behavioural responses in birds at the nearest point of the SPA/Ramsar site.

Shipping: The Applicant considered that additional shipping movements during construction would be minimal (and lower than those considered for the operational phase under footnote 'b' below) and no assessment thresholds for shipping movements would be exceeded. Whilst construction phase movements would include additional barge movements to Mucking landfill and its jetty (carrying translocated brownfield substrates) and this would involve shipping traffic within the SPA/Ramsar site, these additional barge movements would be accommodated within the normal and ongoing delivery pattern of restoration materials to Mucking jetty and would not represent an uplift in disturbance at that location due to the combined and absolute limitations of berthing capacity and tidal restrictions at that site. Thus the Applicant concluded no LSE on the SPA or Ramsar site from the limited shipping activity associated with the construction phase.

Natural England (NE) has not confirmed whether it agrees a LSE can be excluded for these feature and potential impacts. However, its most recent representation [REP5-061] does not suggest any disagreement over these matters.

- b. Lighting:** The Applicant considered that in the operational phase, the mitigating effect of distance similarly rules out a LSE on qualifying bird species within the SPA/Ramsar site from lighting (based on the operational lighting design and predicted Lux contours reported in the Preliminary Lighting Strategy and Impact Assessment at Appendix 9.J of the ES [APP-044] – noting that the draft Development Consent Order (DCO) would require the final lighting strategy to be in general accordance with this Preliminary Lighting Strategy) or visual disturbance emanating from the site.

Noise: The Applicant considered that noise levels generated within the site during operation are unlikely to exceed the peaks associated with construction-phase piling and can therefore also be ruled out as having the potential to give rise to a LSE on the SPA/Ramsar site.

Shipping: Shipping movements would increase by 1,792 vessel movements per annum (over the existing 17,092 movements) as a result of the operational port (see ES Navigation chapter, paras 14.18-14.25 [APP-031]). These increased vessel movements would occur along a broad (c.24km) interface with the SPA and Ramsar site, albeit that the navigable channel is typically >200m from the SPA/Ramsar site boundary. Increased Tilbury2 port-related shipping movements along the Thames bring with them some scope for increased disturbance from noise, lighting and related visual disturbance caused by the movement of vessels *per se*. However, the Applicant considered that because the majority of vessels would be large, with a corresponding large draught, such potential impact sources would be along predictable mid-channel paths, relatively remote (e.g. >200m) from designated intertidal habitats and would be experienced by avian receptors against a backdrop of existing regular traffic of large, distant vessels. The Applicant therefore assessed additional shipping movements from Tilbury2 alone as an imperceptible increase in disturbance in the context of existing levels of habituation.

NE has not confirmed whether it agrees a LSE can be excluded for these feature and potential impacts. However, its most recent representation [REP5-061] does not suggest any disagreement over these matters.

Disturbance (outside SPA/Ramsar site)

- c. Avocet, ringed plover, grey plover, black-tailed godwit and redshank (Birds Directive Article 4.1 and 4.2 qualifying species; and Ramsar Criteria 5 and 6 species) all make use of intertidal habitats in closer proximity to the Tilbury2 site than the SPA/Ramsar site itself. The individual birds involved would in most cases be part of the local wintering or passage population that forms the qualifying feature. Quantitative data on the numbers using intertidal habitats within and in proximity to the proposed DCO limits is provided by the baseline information reported on at ES Chapter 10 (in particular Table 10.41) and further expanded upon in the technical 'Bird Note' (Appendix 9 to the Applicant's updated HRA report [REP5-032], in particular Table 5). The data indicates that peak numbers using intertidal habitat within 300m from the proposed Order Limits at any one time remains in all recorded cases than 1% of the SPA/Ramsar site population (Appendix 9 to the Applicant's updated HRA report [REP5-032], Table 7). 300m is taken by the Applicant as a rational outer extent of impact envelope for significant construction-phase disturbance (whether arising from noise, lighting or human movement and activity) taking into account literature on response distances amongst the bird species concerned (see Table 2 within the Updated HRA Report [REP5-032]) and outputs from the impact studies reported in the ES (in particular noise – Chapter 17, Table 17.30 [APP-031]). Noise impacts are considered to have the potential for the most spatially expansive effects of all these potential sources and therefore the envelope is set by reference to worst case noise impacts (i.e. during piling, which is assumed for assessment purposes to be constant, thus building in further precaution).

The Applicant considered that due to the sub-significant levels of use of intertidal habitats within a 300m envelope by SPA/Ramsar site species, temporary construction phase disturbance effects would not be likely to give rise to a significant effect on the qualifying features. However, as noted in section 3 of this RIES, NE considered that a significant effect cannot be excluded, in large part due to sources of external bias in the long-term dataset (especially the suggestion that activity associated with the marine infrastructure improvement works at Goshems Farm jetty and related activities during 2016 and 2017) and as it considered the 300m zone of influence was inadequate.

For precautionary reasons, the Applicant's updated HRA Report [REP5-032] agreed that LSEs from disturbance to cited bird species using functionally linked habitats cannot be excluded.

- d. The Applicant stated that hen harrier is not likely to make any significant use of habitats that are potentially affected by construction phase disturbance effects (either within or outside the SPA), and the baseline surveys have not recorded any use of the Tilbury2 site by this species more generally (ES Chapter 10 [APP-031]; noting that the single record made by Mr

Larkin at Table 3 of the Bird Note at Appendix 9 to the Updated HRA Report [REP5-032] relates to an individual somewhere along the foreshore between Tilbury and Coalhouse “flying over to Kent”).

NE has not confirmed whether it agrees a LSE can be excluded for this feature. However, its most recent representation [REP5-061] does not suggest any disagreement over this matter.

- e. The Applicant stated that knot has not been recorded using functionally linked intertidal habitats within potential range of construction-phase disturbance effects in either the baseline surveys reported on at ES Chapter 10 (in particular Table 10.41 [APP-031]) or to any meaningful level in the expanded dataset reported in the technical ‘Bird Note’ (Appendix 9 to the Applicant’s updated HRA report [REP5-032]). The Applicant concluded that while small-scale transient use of the 300m envelope around the Tilbury2 DCO boundary by knot cannot be discounted, there is no scope for LSE.

NE has not confirmed whether it agrees a LSE can be excluded for this feature. However, its most recent representation [REP5-061] does not suggest any disagreement over this matter.

- f. The Applicant noted that there is scope for disturbance effects on populations of SPA and Ramsar site qualifying bird species using areas outside the respective designation boundaries during the operational phase from the uplift in vessel traffic along the river. However, the envelope of potentially significant disturbance effects during the operational phase would be substantially smaller than in the construction phase and would capture far less habitat with a potential functional linkage to the SPA and Ramsar site. In addition, the same factors militating against LSE apply when putting this uplift into context as discussed for birds using areas within the respective designations (under (b) above). When considered with the sensitivity of each bird species to disturbance by reference to the TIDE toolkit (Table 2 of the updated HRA report [REP5-032]), and the far lower (and sub-significant) numbers of individuals present closer to the application site, the Applicant concluded there to be no LSE.

NE has not confirmed whether it agrees a LSE can be excluded for these features. However, its most recent representation [REP5-061] does not suggest any disagreement over this matter.

Habitat damage (within SPA/Ramsar Site)

- g. **Sediment circulation or deposition patterns:** Based on the outputs of impact assessments reported on within the appendices to ES [APP-031] Chapters 11 (marine ecology) and 16 (water resources and flood risk – including the Water Framework Directive Assessment at Appendix 16.C [APP-088] and the Hydrodynamic Modelling Study at Appendix 16.D to the ES [APP-089], and as Appendix 8 of the HRA report [REP5-032]), the Applicant concluded that there is no scope for

significant changes to baseline sediment circulation (erosion and deposition) regimes within the SPA/Ramsar site boundary from marine works and dredging, during either the construction or operational phase.

However, one of the two capital dredging scenarios assessed (namely dispersal dredging by water injection (WID)), and the favoured method of maintenance dredging (also WID) have the potential to give rise to very minor, highly localised and temporary increases in sediment deposition within the intertidal areas of the SPA/Ramsar Site (ES Appendix 16.D [APP-089] and Appendix 8 of the Updated HRA Report [REP5-032]). The Applicant's updated screening matrices explained that NE consider that a significant effect cannot be excluded beyond all reasonable scientific doubt, and therefore the Applicant concluded a LSE cannot be excluded from minor changes in sediment circulation patterns.

Water and/or sediment quality: The Applicant noted that localised elevated concentrations of polyaromatic hydrocarbons (PAHs) (including perylene, pyrene and fluoranthene) and of metals (including arsenic, chromium and nickel) have been found in samples of sediment around the existing Tilbury2 jetty and (in particular) the approach channel to it (ES Appendix 11.C [APP-088]). The contaminants generally have low solubility and where mobilised, would mostly remain adsorbed onto sediment particles. This reduces the potential for contamination of the water column, but could pose a risk to sediment dwelling organisms were these substances to be re-deposited at high concentrations.

The risk to marine and estuarine biota is assessed in ES Chapter 11 [APP-031]. Risk to higher trophic orders, including SPA and Ramsar site cited fauna is mainly possible through these substances becoming directly bio-available in re-distributed sediments and or from biomagnification through the food chain, although the risks from biomagnification in the case of PAHs are ameliorated due to the greater capacity of higher organisms to metabolise PAHs.

The Applicant's assessment of the risks of contaminated sediments around the Tilbury2 jetty being redistributed onto intertidal habitats within or otherwise functionally linked to the SPA and Ramsar site is reported at Appendix 8 of the Updated HRA Report [REP5-032]. This assessment indicates that any PAH perylene that is mobilised during dredging operations has a very low risk of becoming available to SPA/Ramsar cited species and a very low risk of significant deposition onto intertidal areas both proximal to the Tilbury2 jetty and within the SPA/Ramsar site further afield. Other contaminants adsorbed to sediments would follow a similar dispersion pathway and therefore the risk of significant effects from mobilisation of other PAHs and metals observed at elevated levels in the samples is assumed by the Applicant to be equivalent or less than for perylene.

However, ultimately the Applicant concluded that it was not possible on the basis of the conclusions of the technical study to conclude no LSE beyond reasonable scientific doubt [REP5-036] and thus a LSE cannot be excluded for the mobilisation of contaminated sediments by dredging activities.

Air quality: Vessel traffic from the Proposed Development would result in emissions of NO_x and SO₂. The Applicant's air quality modelling (Appendix 6 and 7 of the Updated HRA report [REP5-032]) indicates that increases in atmospheric levels and/or deposition loads of both NO_x and SO₂ on habitats within the SPA/Ramsar site boundary would not be significant (in both peak and mean scenarios resulting in all instances in increases of less than 1% compared with critical levels/loads) and would not result in accepted critical loads being exceeded for saltmarsh, mudflat or coastal grazing marsh habitat. However, as there is no equivalent assessment for functionally linked habitats and the predicted change to the 24 hour mean is approaching the 1% significance threshold, taking a precautionary approach (specifically in respect of scarce plant species constituting Ramsar qualifying features), the Applicant concluded a LSE cannot be excluded for functionally linked habitats.

INNS: Increased shipping traffic could elevate the risk of introducing foreign marine or estuarine organisms from the hulls of ocean-going vessels or ballast water. The Applicant concluded that a LSE cannot be excluded.

Loss or damage to functionally linked habitats and populations

- h. Direct loss or damage to functionally linked land:** As noted in section 4 of this RIES, the following functionally linked habitat would be temporarily lost to the Proposed Development:
- 0.035ha of intertidal habitat (comprising saltmarsh, mudflat, and shingle/cobble beach habitat) (to the outfall); and
 - 3.5ha of coastal and floodplain grazing marsh (to the infrastructure corridor).

For effects arising from direct loss of or damage to functionally linked habitat, see references to functionally linked habitats under 'g' above and to functionally linked populations of Criterion 2 species under 'j' below. The Applicant concluded that a LSE cannot be excluded.

Loss or damage to Criterion 2 plant/invertebrate species

- i.** Not applicable.

- j. Lighting:** *Within the Ramsar site* - The Applicant concluded that the effect of distance rules out a LSE on Criterion 2 invertebrate and plant species within the Ramsar site from lighting in both the construction and operational phases. This is based on the lighting design and predicted Lux contours reported in ES Appendix 9.J [APP-044] (including the key Indicative Lighting Strategy figure reproduced within the updated HRA Stage 2 report). NE has not confirmed whether it agrees a LSE can be excluded for this site, feature and potential impact.

Outside the Ramsar site - Outside the Ramsar site boundary and in intertidal habitats close to the jetty, lighting impacts could affect functionally linked populations of Criterion 2 species, potentially initiating physiological responses that could affect species lifecycles, life strategies and the long-term viability of populations. The golden samphire plant is found in intertidal habitats at the Tilbury2 site, where it would potentially be at risk of lighting effects (further details in Chapter 10 of the ES [APP-031]). However, the location where this species grows would have been subject to light spill effects from past operational phases of the jetty (when the power station was active) and there is no evidence that this influenced the distribution or vigour of the colony, or (within scientific literature) that this species is sensitive to light pollution generally. The Applicant considered that Ramsar-cited invertebrate species would not be at risk of significant impacts from lighting, given their co-existence with the operational power station and its jetty in the past. However, the Applicant concluded that a LSE cannot be excluded due to the uncertainty as to physiological responses and the degree of any functional linkage to Ramsar site populations.

Noise: The Applicant concluded that Criterion 2 invertebrate species would not be at risk of significant impacts from noise, given their co-existence with the operational power station and its jetty in the past. This potential impact was not progressed to Stage 2 in the Applicant's Updated HRA Report [REP5-032]. NE has not confirmed whether it agrees a LSE can be excluded for this site, feature and potential impact. However, its most recent representation [REP5-061] does not suggest any disagreement over this matter.

Air quality: Dust - The Applicant concluded that the effect of distance rules out a LSE on Criterion 2 invertebrate and plant species within the Ramsar site from dust deposition impacts. NE has not confirmed whether it agrees a LSE can be excluded for this site, feature and potential impact. However, its most recent representation [REP5-061] does not suggest any disagreement over this matter.

Atmospheric pollutants and deposition - The Applicant concluded that impacts to Criterion 2 species (within or outside the Ramsar boundary) could occur from habitat changes triggered by exceedance of critical loads for atmospheric pollutants and deposition patterns. A LSE cannot be excluded.

Water and sediment quality and sediment circulation and deposition patterns: Cited plant and invertebrate species associated with intertidal habitats could be impacted from changes in sediment circulation systems or from

localised or wider water quality or sediment quality changes within the Thames system (see under 'g' above). A LSE cannot be excluded.

Habitat loss: There would be no direct land take and habitat loss from within the Ramsar site.

The Applicant's screening matrices ([REP5-032]) state that three of the fifteen nationally rare or scarce plant species cited in the Ramsar Information Sheet have been recorded on the Tilbury2 site. For these species, direct habitat loss outside the Ramsar site boundary and within the Order Limits may result in losses of small numbers of individuals e.g. divided sedge *Carex divisa* and annual beard grass *Polypogon monspeliensis* within the infrastructure corridor and golden samphire *Inula crithmoides* at the proposed Thames outfall. However, these losses would be at a de minimis level, with any potential for effects at the population-level being limited by virtue of the small number of plants involved and the continued presence of these species in other nearby habitat outside of the Ramsar site.

At least seven of the twenty-seven Ramsar-cited invertebrate species have previously been recorded within or in the immediate environs of the Tilbury2 site (ES Chapter 10). As a consequence of direct habitat loss there is a credible risk of losses of individuals of Criterion 2 invertebrate species that have been recorded within the Order Limits (e.g. the water beetle *Aulacochthebius (Ochthebius) exaratus*) but the potential for effects at the population-level is considered low, and by extension the risk of significant indirect effects on the Ramsar site populations is considered very low.

In respect of the 3.5ha losses of coastal and floodplain grazing marsh, which typically encompasses poorer quality grassland habitat, the Applicant's screening matrices stated that a proposed combination of on-site and geographically relevant off-site habitat provision is proposed by the Applicant to ensure no net loss of priority Thames Estuary grazing marsh habitats and associated ditch systems (and intertidal habitats as far as possible) as reported on in Chapter 10 of the ES and the Ecological Mitigation and Compensation Plan (EMCP) [REP5-041]. As grazing marsh habitats are of value or potential value to species such as *Lestes dryas*, *Stratiomys longicornis*, *Haematopota bigoti*, *Aulacochthebius exaratus* and *Anisodactylus poeciloides*, this further obviates the scope for any effect on the Ramsar populations by virtue of any functional linkage that may exist.

For saltmarsh species such as *Malachius vulneratus*, the Applicant's updated screening matrices concluded that the near-complete retention of coastal saltmarsh habitats and the low scope for any change to their supporting processes should ensure no significant effect from habitat loss generally. This conclusion is reached on the basis that the habitat losses relate to poorer quality examples of grazing marsh, and de minimis loss of saltmarsh habitat, i.e. without reliance on the compensatory provision proposed in pursuit of 'no net loss' of priority habitat.

However, in large part due to uncertainty as to physiological responses and the degree of any functional linkage to Ramsar site populations, the Applicant concluded that LSEs cannot be excluded for Ramsar plant and invertebrate species.

INNS: The introduction of INNS could occur during both construction and operation. The Applicant concluded a LSE cannot be excluded.

In-combination effects

- k. Additive or synergistic effects are possible for most of the potential impact sources arising from Tilbury2 when considered in-combination with other projects. The extent to which these have the potential to give rise to significant effects on the SPA and Ramsar site, directly or via functionally linked features, varies, but the Applicant's updated screening matrices confirmed that LSEs cannot be excluded for in-combination effects.

Decommissioning

- l. The Applicant has not assessed the potential effects from decommissioning as there is no deemed end life for the Tilbury2 development (paragraph 2.2.2 of the Updated HRA Report [REP5-032]). NE has not confirmed whether it agrees a LSE can be excluded for this site, feature and potential impact. However, its most recent representation [REP5-061] does not suggest any disagreement over this matter.

STAGE 2: EFFECTS ON INTEGRITY

LSE have been identified for the following sites:

- Thames Estuary and Marshes SPA; and
- Thames Estuary and Marshes Ramsar site.

These sites have therefore been subject to further assessment in order to establish if the Tilbury2 NSIP could have an adverse effect on their integrity. Evidence for the conclusions reached on integrity is detailed within the footnotes to the matrices below.

Matrix Key:

- ✓ = Adverse effect on integrity **cannot** be excluded
- ✘ = Adverse effect on integrity **can** be excluded
- ? = IPs dispute whether an adverse effect can be excluded

C = construction

O = operation

D = decommissioning

Cells filled with grey tone denote effects screened out at Stage 1 as not likely to be significant for the reasons and justifications given in the Stage 1 screening matrices.

HRA Integrity Matrix 1: Thames Estuary and Marshes SPA

Name of European site and designation: Thames Estuary and Marshes SPA															
EU Code: UK9012021															
Distance to Tilbury2: c.1.5km															
European site features	Adverse effect on integrity														
	Disturbance (within SPA)			Disturbance (outside SPA)			Habitat damage (within SPA)			Loss or damage to functionally linked habitats			In-combination effects		
Effect	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
<i>Stage of Development</i>															
Article 4.1 qualifying feature: Avocet (winter)				?a			xb	xb		xb	xb		?d	?d	
Article 4.1 qualifying feature: Hen Harrier (winter)							xb	xb		xb	xb		?d	?d	
Article 4.2 qualifying feature: Ringed Plover (passage)				?a			xb	xb		xb	xb		?d	?d	
Article 4.2 qualifying feature: Grey Plover (winter)				?a			xb	xb		xb	xb		?d	?d	
Article 4.2 qualifying feature: Knot (winter)							xb	xb		xb	xb		?d	?d	
Article 4.2 qualifying feature: Dunlin (winter)				?a			xb	xb		xb	xb		?d	?d	

Article 4.2 qualifying feature: Black-tailed Godwit (winter)				?a			xb	xb		xb	xb		?d	?d	
Article 4.2 qualifying feature: Redshank (winter)				?a			xb	xb		xb	xb		?d	?d	
Article 4.2 qualifying feature: Total waterfowl (winter)				?a			xb	xb		xb	xb		?d	?d	

HRA Integrity Matrix 2: Thames Estuary and Marshes Ramsar site

Name of European site and designation: Thames Estuary and Marshes Ramsar site																		
Ramsar Code: UK11069																		
Distance to NSIP: c.1.5km																		
Ramsar qualifying features	Adverse effect on integrity																	
<i>Effect</i>	<i>Disturbance (within Ramsar site)</i>			<i>Disturbance (outside Ramsar site)</i>			<i>Habitat damage (within Ramsar site)</i>			<i>Loss or damage to functionally linked habitats</i>			<i>Loss or damage to Criterion 2 plant/invertebrate species</i>			<i>In-combination effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Criterion 2 qualifying feature (nationally rare and scarce plant and invertebrate species)</i>							xb	xb		xb	xb		xc	xc		?d	?d	
<i>Criterion 5 qualifying feature: Total waterfowl (winter)</i>				?a			xb	xb		xb	xb					?d	?d	
<i>Criterion 6 qualifying feature: Ringed Plover (passage)</i>				?a			xb	xb		xb	xb					?d	?d	
<i>Criterion 6 qualifying feature: Black Tailed Godwit (passage)</i>				?a			xb	xb		xb	xb					?d	?d	
<i>Criterion 6 qualifying feature: Grey Plover</i>				?a			xb	xb		xb	xb					?d	?d	

(winter)																		
Criterion 6 qualifying feature: Knot (winter)							x b	x b		x b	x b						? d	? d
Criterion 6 qualifying feature: Dunlin (winter)				? a			x b	x b		x b	x b						? d	? d
Criterion 6 qualifying feature: Redshank (winter)				? a			x b	x b		x b	x b						? d	? d

Evidence supporting conclusions (note that the same supporting evidence may be referred to for both the SPA and Ramsar site as their extents and boundaries are largely coterminous):

Disturbance (outside SPA/Ramsar site)

- a. Noise:** The Applicant’s updated Stage 2 integrity matrices noted the likely extremely temporary duration of any displacement effect (the principal risk being piling which would be time-limited both within the 24 hour period and in terms of overall duration); the extent of functionally linked habitat available to temporarily displaced birds; and the worst-case approach that has been taken to the assessment (i.e. assuming that all birds could be displaced from the 300m zone of significant noise impacts). Taking these factors into account, the Applicant concluded that it is extremely unlikely that displacement due to disturbance emanating from the Tilbury2 site could have consequences for the SPA or Ramsar site populations, or indeed significant physiological consequences for any individual birds or collective assemblages of individuals or mixed species agglomerations; an adverse effect on integrity as a result of disturbance from noise has therefore been excluded.

As noted in section 3 of this RIES, the Applicant has proposed to monitor bird use of the intertidal habitats proximal to the Tilbury2 site for the duration of the construction phase. The details are presented in a Bird Monitoring and Action Plan (BMAP) [REP5-031]. The Applicant states that this monitoring is not relied upon to reach the conclusion of no adverse effects on integrity. Natural England (NE) [REP5-061] stated that monitoring can be useful as an added precaution where no adverse impact is anticipated.

However, at Deadline 5 NE stated it did not agree to no adverse effect on integrity and therefore is unable to advise further on the matter. The ExA infers that NE does not agree to no adverse effect on integrity from the project alone as a result of the disagreements over the value of functionally linked land and the zones of influence of noise disturbance, as described in Section 3 of this RIES.

Lighting, human activity and shipping: The Applicant's integrity matrices do not make explicit reference to these potential effects. However, paragraph 7.4.1 of the HRA Stage 2 Report [REP5-031] concludes that "*the project will not adversely affect the integrity of the European/Ramsar site, alone or in combination with other plans or projects*".

NE has not specifically confirmed whether it agreed with the Applicant's conclusion of no adverse effect on integrity from disturbance to SPA and Ramsar birds from these potential impacts, for the project alone.

Damage to habitats and species (within and outside the SPA/Ramsar site)

- b. Sediment circulation or deposition patterns:** The sediment plumes from capital and maintenance dredging have been modelled by the Applicant; increases in subtidal deposition are predicted to be localised, and generally low in magnitude (<2mm) for each capital or maintenance dredging event (ES Appendix 16.D and Appendix 8 of the Applicant's updated HRA Stage 2 Report [REP5-032]). The modelling study concludes that the proposed reliance on water injection dredging (WID) for most dredging operations means that displaced sediments would mostly disperse and redeposit within the subtidal zone, with very limited potential for increases in deposition on the intertidal areas. The study further concludes that the resulting variations experienced in the Thames sediment budget would be within the range of annual fluctuations in this part of the Thames (ES Appendix 16.D and Appendix 8 of the Applicant's updated HRA report, section 7.3.3).

For maintenance dredging, the Applicant states that WID would be limited to ebb tide periods outside of the months of June to August to protect from sediment deposition in the intertidal area [REP3-029]. This would be secured through Condition 13 of the draft Deemed Marine Licence (DML). Whilst other methods could be used for maintenance dredging, these would also be subject to relevant controls.

Taking account of construction and operational restrictions contained within the Construction Environmental Management Plan (CEMP) [REP3-011] and/or secured through the draft DML/DCO, the Applicant concludes that there is no scope for significant changes to baseline sediment circulation (erosion and deposition) regimes within the SPA/Ramsar site boundary arising as a consequence of marine works and dredging, during either the construction or operational phases.

An adverse effect on integrity on the Thames Estuary and Marshes SPA and Ramsar site has therefore been excluded by the Applicant as significant effects on sediment circulation regimes both within the downstream SPA and Ramsar site, and on functionally linked intertidal habitats outside those designations, are not anticipated..

Water and/or sediment quality: The Applicant's integrity matrices conclude that adverse effects on integrity would be obviated by the adoption of non-dispersive capital dredging methods (e.g. backhoe dredging) for areas of the approach channel that are contaminated with PAHs or other contaminants. This is secured through paragraph 3(4) of the draft DML which excludes WID from the 'exclusion zone' (delineated in purple on the revised limits of dredging plan [REP5-002] which is to be a certified document within the draft DCO [REP5-044]). The disposal of arisings from such operations would be to an appropriate licensed contaminated sediment treatment site, to be defined in line with the relevant consenting procedures.

Air quality: *Within the SPA/Ramsar site:* As noted in the screening matrix, the Applicant modelled emissions of NO_x and SO₂ from the proposed increase in vessel traffic on the Thames. The results indicate that increases in atmospheric levels and/or deposition loads on habitats within the SPA/Ramsar site boundary would not be significant (in all instances increases of less than 1% of the critical level at the most affected location within the SPA/Ramsar site (Figures 2 to 5 in Appendix 7 of the updated Stage 2 HRA Report [REP5-032])). For nitrogen and acid deposition, the maximum increment at any location within the SPA/Ramsar site is just 0.2% of the most stringent critical load applied (i.e. 8 kg N/ha/yr listed as the lowest value for sand dunes, a habitat that is indicated to be present by on-line tools but which is actually scarce or absent in the SPA/Ramsar site). Accepted critical loads for the broad habitats which encompass the vast majority of the SPA/Ramsar Site, including those used by qualifying bird species (e.g. saltmarsh, mudflat and coastal grazing marsh, for which cited critical load values are 20-30 kg N/ha/yr) within the SPA/Ramsar site are not at risk of being exceeded. The Applicant's integrity matrices conclude no adverse effect on the integrity of the Thames Estuary and Marshes SPA and Ramsar site.

Outside the SPA/Ramsar site: An air quality assessment for functionally linked habitats has not been undertaken, however the Applicant's integrity matrices state that similar conclusions to impacts on the designated sites themselves can be drawn, based on the geographical relationship between these and shipping lanes. The Applicant stated that deposition of atmospheric pollutants onto functionally linked habitats needs to be viewed in the context of an improving background trend (ES Appendix 18.B.3 [APP-095]), and in the context of the precautionary approach adopted (worst case location and most stringent critical load) as well as an improving background trend (as demonstrated in ES Appendix 18.B.3 [APP-095]), and in the context of critical loads being exceeded for such habitats in many locations within and outside the designated areas in the baseline state. The Applicant's integrity matrices state it is conceivable that the contribution made

by shipping emissions from Tilbury2 alone could marginally retard the otherwise positive trend of improvement, at least in the short-medium term; however concludes that there would not be an adverse effect on the integrity of the Thames Estuary and Marshes SPA and Ramsar site.

The Applicant's integrity matrices state that a very high certainty can be attached to this conclusion in respect of the SPA, albeit a slightly lower level of certainty is applicable to the assessment of adverse effects on the integrity of the Ramsar site, due to the latter's inclusion of scarce plant species likely to have a degree of sensitivity to habitat changes attendant with eutrophication.

INNS: The Applicant states that the principal mechanism for managing the risk of INNS from ships is the adherence to International Maritime Organisation (IMO) regulations, particularly the Ballast Water Convention. The UK Government has committed to comply with the Ballast Water Convention, which requires all ships involved in international trade to manage their ballast water to specified standards since September 2017. To mitigate against potential introduction of (marine) INNS, the Applicant states the Port can liaise with the Port of London Authority (PLA)/ Harbour Authorities/ Thames Vision INNS Working Group, and ban cleaning of the hull of the vessels on site. The introduction of INNS through other elements of operation can be mitigated through the implementation of the check-clean-dry protocol. Provisions to manage the risk of INNS are set out within the CEMP, sections 6 and 7 [REP3-011], and within the LEMP [REP1-010], which would be secured through Requirements 4 and 11 of the draft DCO. With these measures in place, the Applicant's integrity matrices conclude there would not be an adverse effect on integrity on the Thames Estuary and Marshes SPA and Ramsar site.

Habitat loss: The loss of functionally linked land for SPA and Ramsar bird species has not explicitly been addressed within the Applicant's integrity matrices. However, paragraph 7.4.1 of the HRA Stage 2 Report [REP5-032] concludes that "*the project will not adversely affect the integrity of the European/Ramsar site, alone or in combination with other plans or projects*".

NE has not specifically confirmed whether it agrees with the Applicant's conclusion of no adverse effect on integrity from habitats damage or loss from these potential impacts, for the project alone. However, its most recent representation [REP5-061] did not raise concerns in this regard.

- c. **Habitat loss of functionally linked land:** Taking account of mitigation measures to limit the spatial influence of construction-phase activity and reduce the potential for damage, the Applicant concluded that the direct losses of functionally linked saltmarsh and intertidal mud habitats that may be used by Criterion 2 Ramsar species would be minimal (0.035ha). Reinstatement and restoration measures would also render such impacts at least partly temporary,

further reducing the potential for a significant effect. The Applicant concluded that the scope for adverse effects on integrity is small, even without regard to the habitat provision that is proposed to ensure no net loss of priority habitat. Taking that habitat provision (as detailed in Section 4 of this RIES) into account, the Applicant considered there to be greater likelihood of net beneficial consequences for Criterion 2 species than net negative, and ultimately no scope for adverse effects on integrity.

The Applicant's integrity matrices did not make reference to the 3.5ha of coastal and floodplain grazing marsh which was identified in the screening matrices. However, paragraph 7.4.1 of the HRA Stage 2 Report [REP5-032] concludes that "*the project will not adversely affect the integrity of the European/Ramsar site, alone or in combination with other plans or projects*".

Lighting (outside the Ramsar site): Although the potential for LSE to Criterion 2 invertebrate species outside of the Ramsar site boundary was identified in the Applicant's screening matrices, no conclusion was made within the integrity matrix in relation to whether there is an adverse effect on integrity [REP5-032]. However, paragraph 7.4.1 of the HRA Stage 2 Report [REP5-032] concludes that "*the project will not adversely affect the integrity of the European/Ramsar site, alone or in combination with other plans or projects*".

NE has not specifically confirmed whether it agrees with the Applicant's conclusion of no adverse effect on integrity from damage to habitats and species of the SPA and Ramsar from these potential impacts, for the project alone. However, its most recent representation [REP5-061] did not raise concerns in this regard.

In-combination effects

- d. In-combination disturbance effects during operation from increased shipping movements:** The Applicant's integrity matrices state that the majority of vessels associated with Tilbury2 would be large, with a corresponding large draught. Therefore potential impact sources would be along predictable mid-channel paths, relatively remote (e.g. >200m) from designated intertidal habitats and would be experienced by avian receptors against a backdrop of existing regular traffic of large, distant vessels. The additional shipping movements from Tilbury2 alone are therefore assessed to represent an imperceptible increase in disturbance in the context of existing levels of habituation.

Whilst a tipping point could theoretically be reached with unbridled future increases in river traffic, the Applicant considered that requirements of navigational safety and the practical limitations of the river's morphology are assessed as likely to militate against large vessel traffic ever achieving a level where it poses a disturbance threat to bird use of

intertidal habitats within or functionally linked to the SPA or Ramsar site. This is in large part due to the requirement for larger vessels to remain within the maintained navigable channel in the central part of the river most remote from such habitats. The Applicant's integrity matrices state that this assessment stands with the additional consideration given to the proposed Tilbury Energy Centre (TEC) and Lower Thames Crossing (LTC) projects, neither of which are likely to give rise to significant additional shipping traffic. The Applicant concluded there would not be an adverse effect on integrity on the Thames Estuary and Marshes SPA and Ramsar site from in-combination disturbance effects during operation from increased shipping movements.

NE has not confirmed whether it agrees to no adverse effect on integrity from this potential in-combination impact.

In-combination effects from displacement of birds from intertidal habitats: The Applicant's integrity matrices concluded that additive disturbance impacts are significantly ameliorated by the relatively limited number of projects that are likely to have overlapping construction phases (by reference to the Qualitative Cumulative Effects Assessment of Tilbury2 with TEC and LTC [REP3-027], anticipated construction periods are 2019 - early 2021 for Tilbury2, mid-2021 - 2025 for TEC, and 2021 - 2026 for LTC); the low number of construction activities likely to involve particularly disturbing activities such as piling; and the limited zone of influence of noise impacts, relative to the amount of intertidal habitat available. The Applicant concluded there would not be an adverse effect on integrity on the Thames Estuary and Marshes SPA and Ramsar site from in-combination effects from displacement of birds from intertidal habitats.

In relation to the Applicant's Cumulative Effects Assessment, NE has stated [REP5-061] that further consideration is required to address uncertainties relating to the significance of habitat value, sedimentation and pollution risk and disturbance of SPA birds. NE also stated that consideration should be given to prolonged disturbance to functionally link land caused by progressive development.

In-combination changes to air quality: Emissions from increased shipping traffic from Tilbury2 have been considered in-combination with those of other plans or projects (including combined cycle gas turbine emissions from TEC and road traffic emissions from LTC). TEC and LTC are not anticipated to become operational for five years after Tilbury2, over which time there are anticipated to continue to be general improvements in air quality in the area (ES Appendix 18.B.3 [APP-095]). The Applicant's HRA Stage 2 Report [REP5-032] included a revised assessment of air quality impacts on designated ecological sites.

The Applicant's integrity matrices concluded that in respect of the avian qualifying features of the SPA and Ramsar site, the effect on critical levels for their habitats is in all cases negligible. The scope for impacts is higher with regard to critical

load exceedances affecting Ramsar-cited flora and the scope for indirect effects on qualifying features through attendant habitat change. Due to the locations of the various sources under consideration (shipping, road traffic, stack emissions), there is limited potential for the emissions to combine to an extent that would exceed critical loads in the qualifying features' key habitats of saltmarsh, mudflat or coastal grazing marsh within the SPA/Ramsar site (i.e. limited potential for any likely significant effect). In the context of improving baseline concentrations and deposition rates along the estuary, and the reduction in the contribution from shipping emissions with increasing distance inland, the Applicant concluded that the cumulative effect of uplifts in vessel traffic from Tilbury2 in-combination with emissions from other proposed projects would not adversely affect the integrity of the Thames Estuary and Marshes SPA and Ramsar site.

NE [REP5-061] noted that the concentrations and deposition rates identified are relatively small. However, it considered that the HRA needs to consider its contribution in light of the Wealden Judgement.

In-combination effects on estuarine processes (including sediment circulation) that support intertidal habitats and related designations, and on water and sediment quality within designated areas or associated with functionally linked habitats: The Applicant's integrity matrices concluded that the potential influence on estuarine processes of the Tilbury2 project has been shown to be negligible and therefore significant in-combination effects are not likely, regardless of the magnitude of effects arising elsewhere. Similarly, the adoption of measures to prevent significant mobilisation of polluted sediments, and the controls imposed by dredging regulators as a matter of standard practice, and the ability of the PLA to control other dredging in the estuary through marine licensing, leaves a negligible potential contribution to any cumulative water quality effects arising from other marine works projects and dredging activities. The Applicant concluded that adverse in-combination effects on estuarine processes and the integrity of the Thames Estuary and Marshes SPA and Ramsar site are unlikely.

In relation to the Applicant's Cumulative Effects Assessment, NE has stated [REP5-061] that further consideration is required to address uncertainties relating to the significance of habitat value, sedimentation and pollution risk and disturbance of SPA birds.

In-combination effects from INNS: The Applicant concluded that additive risks from INNS are mitigated against by adherence to IMO regulations, particularly the Ballast Water Convention, and can be further mitigated against via liaison with the PLA/Harbour Authorities/ Thames Vision INNS Working Group, as described at 'b' above. In the absence of further information from the TEC or LTC projects (and assuming that further information does not identify any higher risk pathways for introduction of INNS from these sources) there is assessed to be no prospect of an adverse effect on the integrity of the SPA or Ramsar site.

NE has not confirmed whether it agrees to no adverse effect on integrity from this potential in-combination impact.

In-combination loss of functionally linked habitat: This potential in-combination effect was not considered in the Applicant's integrity matrices [REP5-032]; however, the Applicant's written summary of the June hearings [REP5-036] stated that the extent of temporary losses of functionally linked habitat (paragraph 6.2.9) cannot be properly defined for either TEC or LTC at this stage. Likewise, the extent of potential impacts from TEC on functionally linked coastal habitat, including displacement/ removal of benthos, release of chemicals and thermal plume is yet to be fully quantified for TEC. For both the LTC and TEC schemes the extent of any such potential impacts may be reduced via avoidance, minimisation, mitigation and compensation where appropriate. However, the Applicant considered that until the details of those designs are available, a full assessment of these matters cannot reasonably fall to be undertaken by the Applicant for Tilbury2, and must logically fall to the promoters of TEC and LTC.

The Applicant has concluded at paragraphs 8.2.1-8.2.2 of the Stage 2 HRA report [REP5-032] that there is sufficient certainty on the basis of the available evidence and the reasons given in the report that there will not be an adverse effect on integrity resulting from these potential in-combination effects.

In relation to the Applicant's Cumulative Effects Assessment, NE has stated [REP5-061] that further consideration is required to address uncertainties relating to the significance of habitat value, sedimentation and pollution risk and disturbance of SPA birds.