

**HABITATS REGULATIONS ASSESSMENT FOR AN APPLICATION UNDER THE
PLANNING ACT 2008**

***Development Title:* Port of Tilbury (Expansion)**

January 2019

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1. Introduction

Background

- 1.1 This is a record of the Habitats Regulation Assessment (“HRA”) that the Secretary of State for Transport has undertaken under regulation 63 of the Conservation of Habitats and Species Regulations 2017 (“the Habitats Regulations”) in respect of the Development Consent Order (“DCO”), including Deemed Marine Licence (“DML”) for the proposed Port of Tilbury (Expansion) Development (known as Tilbury2) and its associated infrastructure (“the Development”). For the purposes of the Habitats Regulations the Secretary of State is the competent authority in respect of the Development.
- 1.2 The Port of Tilbury London Limited (“the Applicant”) applied to the Secretary of State for a DCO under section 37 of the Planning Act 2008 (“PA 2008”) for the proposed Development. The Development application is described in more detail in section 2.
- 1.3 The Development includes a new roll-on/roll-off (“Ro-Ro”) port terminal and a Construction Materials and Aggregates Terminal (“CMAT”). The Development constitutes a nationally significant infrastructure project (“NSIP”) as defined by sections 14(1)(j) and 24 of the PA 2008 as it comprises a new harbour facility in England with Ro-Ro facilities exceeding a throughput of 250,000 units per annum.
- 1.4 The Development application was accepted by the Planning Inspectorate (“PINS”) on 21 November 2017 and a three-member Panel of Inspectors (“the Panel”) was appointed as the examining authority for the application. The examination of the Development application began on 20 February 2018 and was completed on 20 August 2018. The Panel submitted its report of the examination, including its recommendation (“the Panel’s Report”), to the Secretary of State on 20 November 2018.
- 1.5 The Secretary of State’s conclusions on the implications for European Sites from the Development contained in this HRA report have been informed by the Panel’s Report, and subsequent documentation as listed at 1.11.

Habitat Regulation Assessment

- 1.6 Council Directive 92/43/ECC on the conservation of natural habitats and of wild fauna and flora (“the Habitats Directive”) and Council Directive 2009/147/EC on the conservation of wild birds (“the Birds Directive”) aim to ensure the long-term survival of certain species and habitats by protecting them from adverse effects of plans and projects.
- 1.7 The Habitats Directive provides for the designation of sites for the protection of habitats and species of European importance. These sites are called Special Areas of Conservation (“SACs”). The Birds Directive provides for the classification of sites for the protection of rare and vulnerable birds and for regularly occurring migratory species. These sites are called Special Protection Areas (“SPAs”). SACs and SPAs are collectively termed European sites and

form part of a network of protected sites across Europe. This network is called Natura 2000.

- 1.8 In the UK, the Habitats Regulations transpose the Habitats and Birds Directives into national law as far as the 12 nautical mile limit of territorial waters. The Convention on Wetlands of International Importance 1972 (“the Ramsar Convention”) provides for the listing of wetlands of international importance. These sites are called Ramsar sites. UK Government policy is to afford Ramsar sites the same protection as European sites (and the term “European sites” as used subsequently in this Report includes Ramsar sites).

- 1.9 Regulation 63 of the Habitats Regulations provides that:

“(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which—

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

must make an appropriate assessment of the implications of the plan or project for that site in view of that site’s conservation objectives.”

- 1.10 While the proposed Order limits of the Development does not overlap directly with any European site, there are two sites within the vicinity of the Development. The Development is not connected with or necessary to the management for nature conservation of any European site and so, if it is found that the Development is likely to have a significant effect on a European site (as considered in section 4), an Appropriate Assessment under regulation 63 of the Habitats Regulations will be required.

- 1.11 This HRA has taken account of and should be read in conjunction with the following documents that provide extensive background information:

Application documents

- Environmental Statement (“ES”) including the Applicant’s shadow HRA Report (Appendix 10 to the ES) (“Applicant Shadow HRA”)¹
- Habitats Regulations Assessment (HRA) Stage 2 Report Final Version for Deadline 7 (“the Applicant’s Shadow HRA Stage 2 Report”)¹ including the revised Bird note (Appendix 9 to the ES)

Examining Authority documents

- Report on the Implication for European Sites (“REIS”)
- the Panel’s Report

¹ The Applicants “shadow” HRA is aligned to the Planning Inspectorate Commissions Advice Note 10, whereby the Applicant is to “shadow” the HRA process by providing a shadow HRA to the competent authority (Secretary of State) within the DCO application. The REIS and the Panel Report refers to the “Applicants Shadow HRA Stage 1 Report” as the “initial” report and the “Applicants Shadow HRA Stage 2 Report” is referred to in the REIS and Panel Report as Stage 2 report.

Relevant representation (Comments on REIS)

- Applicant – Response to examining authority's report on the implications for European sites Tilury2 document (Ref: POTLL/T2/EX/192)
- Natural England:
 - Deadline 1 Written Representation and Response to first written questions (22 March 2018)
 - Deadline 3 Written Submission of Oral Case & Post-Hearing Submissions 2 May 2018
 - Deadline 4 Submission (23 May 2018)
 - Deadline 5 Submission (10 July 2018)
 - Deadline 6 Submission (7 August 2018)
 - Deadline 7 Submission (17 August 2018)
- Statement of Common Ground Update Report for Deadline 7
- Marine Management Organisation – (Ref : 20010091)

1.12 In considering the possible impacts of the Development and in reaching his conclusions, the Secretary of State has also taken into account the duties and obligations provided for under the Habitats Regulations, which came into force on 30 November 2017. The key considerations in this context are securing compliance with the Habitats and Birds Directives; preserving, maintaining and re-establishing a sufficient diversity and area of habitat for wild birds in the United Kingdom; and using all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds.

1.13 As far as is possible, the key information in these documents and written representations is summarised and referenced in this report.

Structure of this Report

1.14 In addition to a description of the Development (section 2) and its location (section 3), this HRA comprises a Test of Likely Significant Effects ("LSE") in respect of two European sites – Thames Estuary and Marshes Special Protection Area and Thames Estuary and Marshes Ramsar Site (section 4), and an Appropriate Assessment ("AA") (section 5) in respect of both of these sites. The AA, in section 5, considers the impacts of the Development alone and the impacts of the in-combination effects with other plans and projects separately. A summary of the conclusions is set out at section 6.

The RIES and Statutory Consultation

1.15 The Panel, with support from the environmental services team at PINS, prepared a RIES. The RIES was published on PINS planning portal website on 13 July 2018 and consultation on the RIES took place between 13 July 2018 and 3 August 2018. The RIES was issued to ensure that interested parties, including the statutory nature conservation body Natural England ("NE"), were formally consulted on Habitats Regulations matters for the purposes of regulation 63(3) of the Habitats Regulations. The RIES and written responses were then summarised and concluded in the Panel's Report. These documents have been taken into account in this assessment.

- 1.16 In response to the consultation on the RIES, and with regard to the assessment of LSE, NE confirmed it agreed with the position reached regarding features and potential impacts screened in or out within the RIES.
- 1.17 In drafting the RIES, the Panel inferred from footnote h of the Applicant's screening matrix in the Deadline 5 version of the Applicant's Shadow HRA Stage 2 Report that a LSE for direct loss or damage to functionally linked land should be screened in. The applicant disputed this as they concluded that there would be no LSE as the intertidal and mud flat habitat loss would be temporary. The Secretary of State agrees with the Panel that LSE are those presented within the screening matrices of the RIES (Annex 2), also included in Annex 2 of this report. The following LSE Test (section 4), screens in direct loss or damage to functionally linked land accordingly.

Relationship to other consents and licences / interdependencies

- 1.18 The DCO is not the only consent, licence or permit required to construct and operate the Development. In addition to the consent required under the PA2008 (the subject of this report and recommendation), the proposed development may require other consents and permits for its construction and operation. These are set out in the Consent and Applicant's Agreements Position Statement (Document Ref 7.2) and include:
- Environmental Permits under the Environmental Permitting (England and Wales) Regulations 2016;
 - Protected Species Licences under the Wildlife and Countryside Act 1981, the Conservation of Habitats and Species Regulations 2017 and other legalisation;
 - any consents required under the Highways Act 1980 in respect of construction works; and
 - any section 61 consents under the Control of Pollution Act 1974 for works outside of hours specified or which exceed permitted noise thresholds.
- 1.19 The Secretary of State has considered the available information bearing on these matters and, without prejudice to the exercise of discretion by future decision-makers, has concluded that there are no apparent impediments to the implementation of the proposed development, should development consent be granted.

2. Development Description

- 2.1 The DCO for the Port of Tilbury (Expansion) Development would authorise the Applicant to construct and operate a new harbour facility in the form of an operational port. The proposed development would be a Ro-Ro terminal, a CMAT, and associated infrastructure including rail and road facilities and modifications to the existing marine infrastructure. The infrastructure corridor would accommodate road and rail links to the existing rail and road network. The CMAT would include stockpiling of construction materials and some processing of aggregates for the production of asphalt and concrete products.
- 2.2 The proposed Ro-Ro berth would include:
- the alteration, renovation and renewal of an existing river jetty and its associated structures including fenders and piles;
 - the removal of an existing jetty and associated structures;
 - the alteration and renewal of an existing flood defence;
 - the construction of dolphins in the river bed with associated fenders and walkways;
 - the construction of a floating pontoon with associated structures and buildings;
 - the construction of an approach bridge with abutments, with a roadway, footway and wind barrier on the surface of the bridge;
 - the construction of a linkspan bridge between the floating pontoon and the approach bridge, with a roadway, footway and wind barrier on the surface of the bridge; and
 - the construction of a surface water outfall.
- 2.3 The CMAT berth would include:
- the alteration, renovation and renewal of an existing jetty and its associated structures including fenders and piles;
 - the construction of dolphins in the river bed with associated fenders and walkways;
 - the construction of a conveyor hopper and supporting structures on the river bed;
 - the installation of pipework on the jetty and connections to the proposed silo facilities; and
 - the construction of a conveyor and supporting structures in the river bed.
- 2.4 Related dredging works within the river Thames, piling works and construction operations (including piling and scour preventative and remedial works) within the river Thames would be needed for the extended jetty providing the two new berths.
- 2.5 The land side development would include:
- a Ro-Ro terminal, including the construction of rail sidings and rail infrastructure, and ancillary buildings;
 - access to the Ro-Ro terminal;

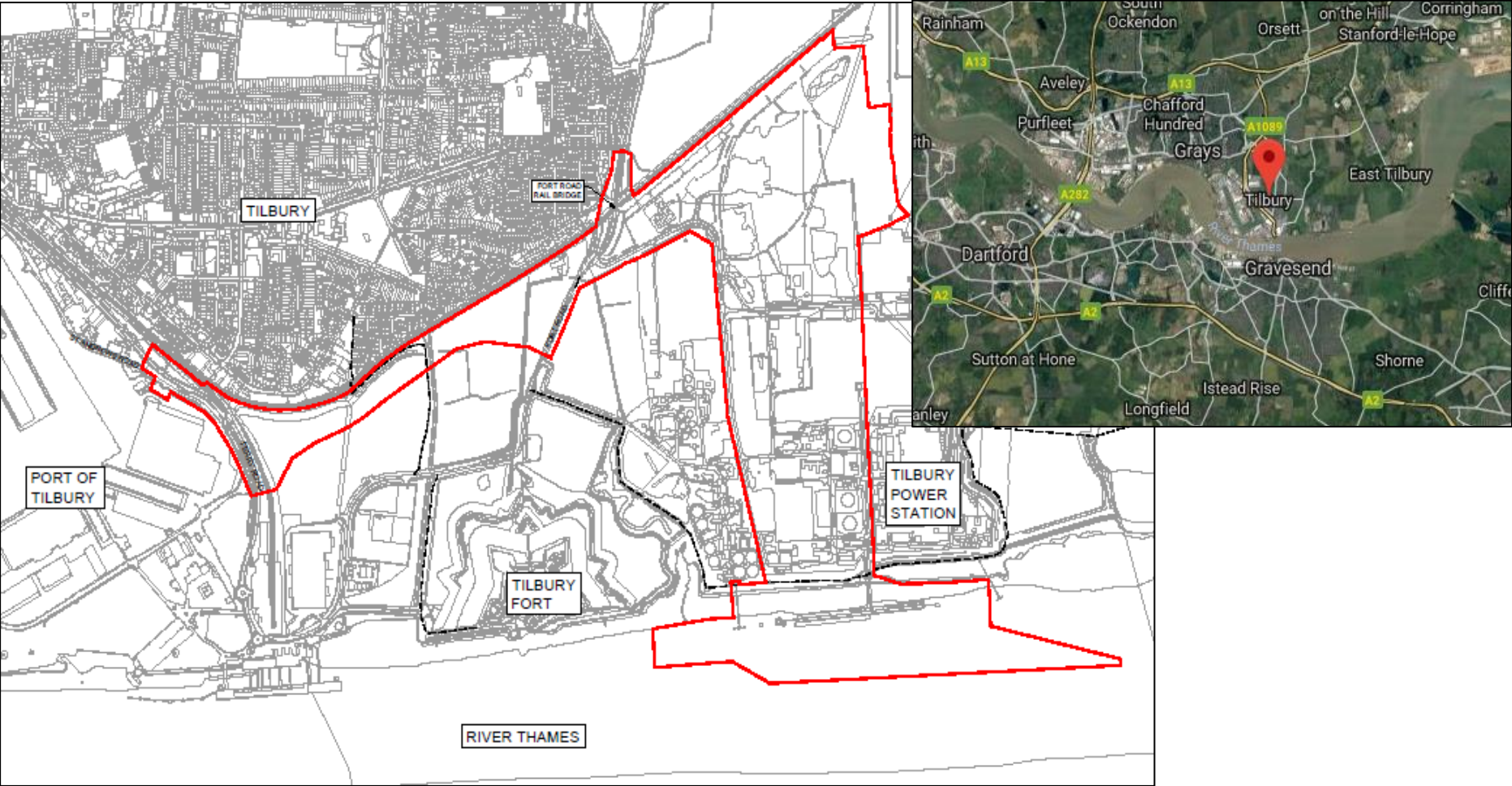
- an operational compound to serve the Ro-Ro terminal;
 - the construction and layout of storage areas and a warehouse;
 - a CMAT, including silo facilities, a railway line and associated infrastructure, a conveyor, an aggregate storage yard, and access;
 - a new highway to serve the proposed development, including a new overbridge;
 - a new railway line to serve the proposed development; and
 - road improvements at the ASDA Roundabout.
- 2.6 The Development, once fully developed and operational, would provide for an initial expected throughput of 360,000 Ro-Ro units per annum with a maximum expected operational capacity of 500,000 units.
- 2.7 The CMAT would be likely to have a throughput of circa 1.9 million metric tonnes per annum of bulk product and would qualify as 'cargo' (as opposed to container or Ro-Ro) for the purposes of section 24(3) of the PA2008.
- 2.8 The harbour facilities at Tilbury2 would therefore be designed to handle more than one class of material and in this situation section 24(5) of the PA2008 provides formulae to calculate whether the relevant quantities when added together to form what is termed the "equivalent quantity" of material handled meets the defined threshold. The Applicant's calculations demonstrate that the Ro-Ro berth does so on its own, as is apparent from paragraph 2.6, while the CMAT berth does not, but when the two quantities are combined, they exceed the threshold for an NSIP under section 24 of the PA2008.

3. Development location and designated sites

Location

- 3.1 The Development application relates to a site on the former Tilbury A power station. The site consists of 61ha of land, south east of the town of Tilbury in the unitary authority of Thurrock. The site is on the north bank of the river Thames, opposite the town of Gravesend in Kent to the south of the river, and lies approximately 450m to the east of the Tilbury Fort scheduled monument at its closest point. The operational area of the existing port lies some 820m to the west at its closest point, and the proposed development is some 9km to the east of the Dartford Crossing (see Figure 1).
- 3.2 The northern boundary of the Development site is defined by the Tilbury loop of the London-Southend railway line. The southern boundary is defined by the river Thames, and including the deep water jetty previously used for the importation of coal and wood products to feed the power station which occupied both the application site and adjacent land. The river Thames directly south of the Development site comprises the navigation channel of the river which serves a variety of shipping and leisure traffic, much of which is associated with the Port of Tilbury itself. The river is approximately 1.03km wide at this location.
- 3.3 To the east, the site is bounded in part by agricultural land, in part by the Tilbury 400kv electricity substation operated by National Grid, and in part by the remainder of the power station complex which is in the process of being demolished.
- 3.4 Immediately to the west, the Development site is bounded by the Anglian Water Tilbury Water Recycling Centre (formerly known as Tilbury Sewage Treatment Works). The southern part of this site is used for sewage treatment, whereas the northern part is operated by Stobarts Biomass Products Limited for waste wood storage and as a fuel processing plant to manufacture and supply the Tilbury Green Power Station located within the existing port. To the west of the Water Recycling Centre is Bill Melroy Creek, a small tidal tributary of the river Thames, and beyond that Tilbury Marshes surrounding Tilbury Fort.
- 3.5 The land bound by the Order limits comprises four areas, namely:
- the main Tilbury2 site on the former Tilbury 'A' Power Station land;
 - the infrastructure corridor to the main site between Ferry Road and Fort Road;
 - land around the ASDA roundabout to the north of the Port where highway improvements would be required; and
 - sections of the tidal river Thames required for the construction of expanded berthing capacity and associated dredging.

Figure 1: *Development location*



European and International Sites

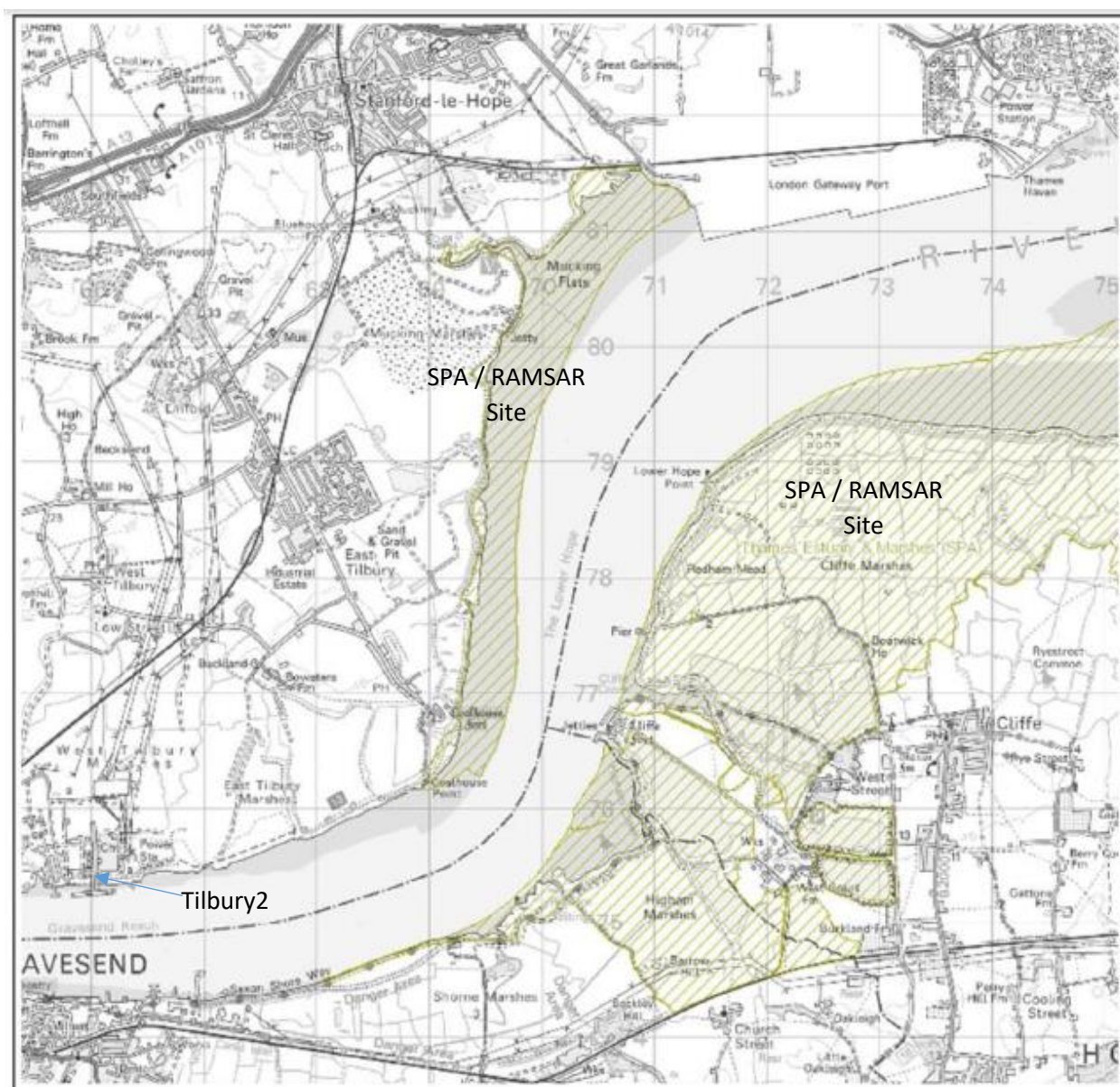
- 3.6 The Development is not connected with or necessary to the management of nature conservation of any European site, and is therefore subject to the Habitat Regulations.
- 3.7 The Applicant's Shadow HRA identified two European sites (as confirmed in Annex 2 of the RIES and also included at Annex 2 of this report). In addition to the two identified European sites, interested parties identified the saltmarsh / intertidal mudflat habitat which is functionally linked to the European sites. This land was then included in the Applicant's Shadow HRA Stage 2 Report. Accordingly, this report assesses the impact of the Development on:

- Thames Estuary and Marshes Special Protection Area ("SPA") designated under the Habitats Regulations;
- Thames Estuary and Marshes Ramsar Site ("Ramsar") designated under the Convention on Wetlands of International Importance 1971 and
- functionally linked habitats outside the SPA and Ramsar Site.

These sites are shown in Figure 2.

- 3.8 The SPA and Ramsar Site 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. At its closest point, within the navigational approach channel in the river Thames, the Order limits of the Development are approximately 1.5km from the SPA and Ramsar Site. The nearest area of land within the Order limits (the jetty structures) is approximately 2km from the SPA and Ramsar site. Intertidal habitat which is functionally linked to the SPA and Ramsar Site is located within the Order limits between the main site and the jetty and is around 2.1km from the SPA and Ramsar Site.
- 3.9 These European sites were selected for inclusion within the assessment based on the maximum extent of the likely impacts of the Development, which the Applicant established as follows:
- air quality and water quality impacts – assessed using atmospheric dispersion and hydrodynamic modelling;
 - impacts from lighting and disturbance to water birds – assessed using the Water Bird 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 – assessed using professional judgement.
- 3.10 The Habitats Regulations require that, where development is likely to have a significant effect on any such site, an AA is carried out to determine whether or not the development will adversely affect the integrity of the site in view of its Conservation Objectives. In this document, the assessments as to whether there are LSE's, and where required, the AAs, are collectively referred to as the HRA.

Figure 2: Site location relative to the two European Sites



Key:



Thames Estuary and Marshes SPA and Ramsar Site.

4. Likely Significant Effects (“LSE”) Test

- 4.1 An AA is required if a plan or project is likely to have a significant effect on a European site, either alone or in combination. A LSE is, in this context, any effect that may be reasonably predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects.
- 4.2 The purpose of this test is to identify LSEs on European sites that may result from the Development and to record the Secretary of State’s conclusions on the need for an AA and his reasons for screening activities, sites or in-combination plans and projects in or out of further consideration in the AA. For those features where an LSE is identified, these must be subject to an AA. This review of potential implications can be described as a ‘two-tier process’ with the LSE test as the first tier and the review of effects on integrity (AA) as the second tier.
- 4.3 This section addresses the first tier of the Applicant’s Shadow HRA, for which the Secretary of State has considered the potential construction and operational impacts of the Development both alone and in combination with other plans and projects on each of the interest features of the European sites identified by the Applicant’s Shadow HRA Stage 2 Report, the RIES and agreed by the Panel and NE, to determine whether or not there will be an LSE. As the Development is a permanent form of development no decommissioning is envisaged. Potential impacts arising from decommissioning have not therefore been considered in this HRA report. Of all the European sites identified during the Examination, the Applicant concluded that significant effects were likely for the SPA and Ramsar Site and their qualifying features either alone or in combination. A summary of the qualifying features of these sites is set out below in Table 1.

Table 1: European sites and qualifying features considered in the Applicant's Shadow HRA Stage 2 Report

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)

Likely significant effects – the Development Alone

Potential Impacts

- 4.4 The Secretary of State has considered the Development's potential construction and operational impacts on the relevant interest features of the European sites and on functionally linked features to determine whether there will be LSE in the context of the Habitats Regulations. No mitigation measures have been relied upon in this screening exercise.
- 4.5 The potential impacts used within the LSE test were considered within the Applicant's Shadow HRA Stage 2 Report and the RIES. Impact sources from the proposed Development on the European sites and on functionally linked features include (and as presented in Annex 1 of this report):
- changes to air quality – from road, non-road (dust emissions) and shipping emissions (NO_x and SO₂);
 - changes to existing coastal and estuarine processes (sediment circulation and deposition patterns) – from construction of marine structures, capital and maintenance dredging (with potential to give rise to very minor, highly localised and temporary increases in sediment deposition within the intertidal areas of the SPA/Ramsar Site);
 - changes to water and/or sediment quality within the river Thames – from construction of marine structures, capital and maintenance dredging. (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);

- disturbance from increased shipping. (Shipping movements would increase by 1,792 vessel movements per annum as a result of the operational port);
- noise, lighting and human activity. (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. 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);
- Invasive Non-Native Species (Increased shipping traffic could elevate the risk of introducing foreign marine or estuarine organisms from the hulls of ocean-going vessels or ballast water);
- construction waste and pollutants;
- operational waste and pollutants; and
- habitat loss or damage to habitat which is functionally linked to the European sites. (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).

4.6 The zone of influence of potential impacts used in the RIES extends up to 300m from the Development. This has been used to inform this HRA as the Secretary of State is satisfied that this represents the worst case approach for the majority of potential impacts, with the exception of air quality impacts from shipping (>5km from navigational channel), noise/lighting/movement disturbance associated with increased shipping traffic along the river Thames navigable channel (300m from navigational channel) and sediment mobilisation and re-deposition from the proposed marine works and dredging (40km).

4.7 With regard to potential noise impact from construction activity (piling), the Applicant's Shadow HRA Report assessed potential noise impacts within a 300m zone of influence extending from the proposed development, which was based on the Water Bird Disturbance Mitigation Toolkit (TIDE toolkit). These conclusions had been subject to an additional precautionary sensitivity testing exercise by the Applicant based on a larger 500m envelope to exclude any uncertainty arising from NE's concerns that a 500m zone of influence would be more appropriate. The applicant concluded that the HRA conclusions were not altered by the adoption of a 500m zone of influence for noise impacts. NE did not comment on this further.

Functionally-linked land – Potential intertidal habitat loss

- 4.8 In respect to this HRA, the functionally linked land is represented by the saltmarsh and intertidal and mud flats that support the Thames Estuary and Marshes SPA/Ramsar Site, within the footprint of the Development.
- 4.9 The Applicant concluded in their shadow HRA Report, that significantly less than 1% of the Thames Estuary and Marshes SPA/Ramsar Site is involved in the use of intertidal habitats and based on assessments of noise and vibration and Lux contouring from lighting assessments, concluded that there is no scope for LSE on the SPA/Ramsar Site.
- 4.10 NE disagreed with this as they had concerns about the potential impact of disturbance to over wintering and passing birds and did not agree to the Applicant's wintering bird survey conclusions and also considered that the functionally linked habitat had been undervalued. NE also considered that the importance of non-breeding bird interest within the Applicant's '300m impact zone' to be more significant than indicated by the Applicant. Subsequently, the Applicant acknowledged LSE resulting from disturbance to qualifying features of the Thames Estuary and Marshes SPA and Ramsar Site (Table 1) utilising functionally linked land from construction activities could not be ruled out. Therefore the Secretary of State has screened in LSE to the two European sites resulting from anticipated loss of or damage to this functionally linked land (see Annex 2: Stage 1 screening matrices).

Likely significant effects – In-combination

- 4.11 Under the Habitats Regulations, the Secretary of State is obliged to consider whether other plans or projects might affect some of the same European sites as the Development. The Applicant's Shadow HRA set out the environmental effects of the Development in combination with the effects of the following projects as part of the initial EIA process, where relevant information was available. Based on PINs Advice Note 9 (using the Rochdale envelope), the Applicant considered the following projects in relation to cumulative, in-combination effects:
- Thames Enterprise Park, south east of Corringham;
 - Oikos Storage Proposals, Canvey Island;
 - Goshems Farm Jetty, East Tilbury;
 - Ash Fields to the east of Tilbury B Power Station;
 - Land at Fiddlers Reach, Grays;
 - West Thurrock Biomass OHP plant; and
 - London Resort
- 4.12 However, the above project proposals (as per para 4.11) were subsequently screened out of the cumulative impact assessment and not included in the Applicant's Shadow HRA Stage 2 Report. Following consultation on the RIES, it was suggested that two other projects should be included; the redevelopment of the Tilbury 'B' Power Station with a new power station to be called the Tilbury Energy Centre ("TEC"), and the Lower Thames Crossing ("LTC"), however these were also initially screened out by the Applicant.

- 4.13 The Applicant's decision for ruling out London Resort was due to the lack of detailed information for this project. Having regard to PINS guidance on these matters in its Advice Notes 9 and 17, the Applicant concluded that it was not possible to define the nature of environmental impacts of London Resort and that it was not therefore included as a project within the Applicant's Cumulative Impact Assessment. This decision was not challenged.
- 4.14 The Applicant's decision for ruling out TEC and LTC was that a scoping report had not been submitted for TEC, meaning that there was a lack of available detail about the project and that construction programs were unlikely to overlap with the Development; and that it would be for TEC to consider this Development in its cumulative assessment. NE responded citing concerns relating to non-breeding bird features.
- 4.15 The Applicant's decision for ruling out LTC was also on the basis that there was a lack of detailed information available for this project. NE's response was that there is potential for impacts from the Development and LTC to overlap and/or occur in successive years; explaining that this could have prolonged implications for the Thames Estuary and Marshes SPA and Ramsar Site, including the capacity to achieve favourable condition status. In response to NE's objections and the Scoping Requests for both TEC and LTC becoming available during the course of the Examination, the Applicant provided a high level, qualitative and proportionate Cumulative Effects Assessment of the Development with TEC and LTC both separately and in combination within the Applicant's Shadow Stage 2 HRA Report (included in Annex 2 of this report). NE remained of the view that the Applicant should make additional attempts to quantify impacts further using available information. The Panel however noted that it was not clear what additional information was available to the Applicant to facilitate a more detailed in-combination assessment and whether this would impact the findings. The Secretary of State agrees with the Panel that the in-combination assessment carried out by the Applicant is based on the most up to date information (i.e. scoping requests) available at the time and that no further evidence has been provided to suggest otherwise.
- 4.16 The in-combination assessment relating to the LTC and the Development (as included in Annex 2), identified the following in-combination LSE on the Thames Estuary and Marshes SPA/Ramsar Site and functionally-linked land (during the operational phase of Tilbury2):
- 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.
- 4.17 The in-combination assessment relating to TEC and the Development (as included in Annex 2), identified in-combination LSE on the Thames Estuary and Marshes SPA/Ramsar Site and functionally-linked land:
- 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.
- 4.18 The Secretary of State notes the letter published on the TEC project page of the PINs website (19 November 2018) from RWE, setting out that a decision has been made to 'freeze' the proposed TEC development and that "...the project will not be progressed". However, as the application has not been formally withdrawn, the Secretary of State has continued to consider this development under the precautionary principle.
- 4.19 For the purposes of producing the screening and integrity matrices (Annex 2 of the REIS and Annex 2 of this report) the Applicant grouped the potential impact sources into broad effect categories of disturbance, habitat loss or damage, loss or damage to Criterion 2 plants/invertebrates and in-combination effects, as shown in Table 2.

Conclusion on LSE Test (Alone and In-combination with TEC and LTC potential development)

- 4.20 The Secretary of State is satisfied that the correct potential impacts and relevant features for which there are LSE on the Thames Estuary and Marshes SPA and Thames Estuary and Marshes Ramsar Site are those presented in Annex 2 (and Annex 2 of the REIS) and agreed by NE. The following sets out the Secretary of State's conclusions with respect to the LSE test and are further summarised in Table 2.
- 4.21 The Secretary of State agrees with the Applicant's conclusion that the LSE from construction and operation of the Development on the Thames Estuary and Marshes SPA and Thames Estuary and Marshes Ramsar Site can 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 Thames Estuary and Marshes 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.
- 4.22 The Secretary of State agrees with the Applicant's conclusion that LSE from construction and operation of the Development on the Thames Estuary and Marshes SPA and Thames Estuary and Marshes Ramsar Site could not be excluded for:
- damage to habitats within the Thames Estuary and Marshes 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 Thames Estuary and Marshes SPA and Ramsar Site and more proximal to the Development site from the same sources, with possible consequences for bird populations associated with the SPA, and bird, flora and invertebrate fauna (light impact) associated with the Ramsar Site;
- disturbance or damage to habitats within the Thames Estuary and Marshes SPA and/or Ramsar Site or to functionally linked habitats outside the designation boundaries in-combination with other consented or planned projects.
- in-combination effects during construction and operations:
 - disturbance during operation from increased shipping movements;
 - displacement of birds from intertidal habitats;
 - changes to air quality from shipping emissions;
 - effects on estuarine processes;
 - effects from INNS; and
 - loss of functionally linked habitat.

Table 2: Summary of the HRA screening exercise.

Potential effect	Screened in or out?	
	Thames Estuary and Marshes SPA	Thames Estuary and Marshes Ramsar site
Disturbance to cited bird species within the European site during construction and operation	Out	Out
Disturbance to avocet, ringed plover, grey plover, black-tailed godwit and redshank using functionally linked habitats during construction	In	In
Disturbance to avocet, ringed plover, grey plover, black-tailed godwit and redshank using functionally linked habitats during operation	Out	Out
Disturbance to hen harrier or knot using functionally linked habitats during construction and operation	Out	Out
Habitat damage within European site during construction and operation	In	In
Loss or damage to functionally linked habitats during construction and operation	In	In
Loss or damage to Criterion 2 plant/invertebrate species during construction and operation	n/a	In
In-combination effects during construction and operation	In	In

5. Appropriate Assessment

Test for Adverse Effect on Site Integrity

- 5.1 The requirement to undertake an AA is triggered when a competent authority, in this case the Secretary of State, determines that a plan or project is likely to have a significant effect on a European site either alone or in combination with other plans or projects. Guidance issued by the European Commission states that the purpose of an AA is to determine whether adverse effects on the integrity of the site can be ruled out as a result of the plan or project, either alone or in combination with other plans and projects, in view of the site's conservation objectives (Assessment of plans and projects significantly affecting Natura 2000 sites, Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission, 2001).
- 5.2 The purpose of this AA is to determine whether or not adverse effects on the integrity of those sites and features during the LSE test can be ruled out as a result of the Development alone or in combination with other plans and projects in view of the site's conservation objectives and using the best scientific evidence available.
- 5.3 If the competent authority cannot ascertain the absence of an adverse effect on site integrity within reasonable scientific doubt, then under the Habitats Regulations, alternative solutions should be sought. In the absence of an acceptable alternative, the Development can proceed only if there are imperative reasons of overriding public interest ("IROPI") and suitable compensation measures identified. Considerations of IROPI and compensation are beyond the scope of this AA.
- 5.4 Under regulation 63(3) of the Habitats Regulations the competent authority must, for the purposes of an AA, consult the appropriate nature conservation body (which in this case is NE) and have regard to any representation made by that body within such reasonable time as the authority specifies.

Conservation Objectives

- 5.5 European Commission guidance indicates that disturbance to a species or deterioration of a European site must be considered in relation to the integrity of that site and its conservation objectives (European Commission, 2000). Section 4.6.3 of that guidance defines site integrity as:

"...the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified" (Assessment of plans and projects significantly affecting Natura 2000 sites, Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission, 2001).
- 5.6 Conservation objectives outline the desired state for a European site, in terms of the interest features for which it has been designated. If these interest features are being managed in a way which maintains their nature

conservation value, they are assessed as being in a 'favourable condition'. An adverse effect on integrity is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of its designation (English Nature (1997) Habitats Regulations Guidance Note, HRGN 1).

- 5.7 There are no set thresholds at which impacts on site integrity are considered to be adverse. This is a matter for interpretation on a site-by-site basis, depending on the designated feature and nature, scale and significance of the impact. The conservation objectives for Thames Estuary and Marshes SPA and the Thames Estuary and Marshes Ramsar Site are provided in Annex 4 of this Report. These have been used by the Secretary of State to consider whether the Development has the potential for having an adverse effect on integrity, either alone or in-combination. LSE identified have been taken into account by the Secretary of State in reaching his decision, alongside the potential for adverse impacts on integrity, as a result of the Development alone and in-combination.
- 5.8 In response to the consultation on the RIES, NE stated that it could not agree to the Applicant's Shadow HRA Stage 2 Report conclusion that the Development would not have Adverse Effects on the Integrity ("AEOI") of the Thames Estuary and Marshes SPA or the Thames Estuary and Marshes Ramsar Site (or the functionally linked land). The Secretary of State has considered these responses and the Panel's conclusions accordingly as described in this section.

The Integrity Test – the Development Alone

- 5.9 The Applicant's Shadow HRA Stage 2 Report concluded, based on the Stage 2 Effects on Integrity matrix (as seen in Annex 3 of the REIS and this report), that the Development would not have AEOI on the Thames Estuary and Marshes SPA or the Thames Estuary and Marshes Ramsar Site (or the functionally linked land). This was based on mitigation measures secured in the DCO/DML (as summarised in Table 3).
- 5.10 The Secretary of State agrees with the Panel that these measures would be appropriately secured through the Operational Management Plan ("OMP") and the Construction Environmental Management Plan ("CEMP") through requirements 11 and 4 within the DCO, together with conditions within the DML (Schedule 9 to the DCO).
- 5.11 However, in response to the consultation on the REIS, NE stated that it could not agree to no AEOI for the following:
- direct loss or damage to functionally linked habitats outside the Thames Estuary and Marshes SPA and Ramsar Site (noise disturbance and loss of functionally linked habitat outside the SPA/Ramsar Site);
 - damage to habitats and species (within and outside the Thames Estuary and Marshes SPA/Ramsar Site):
 - temporary or permanent minor changes in estuarine processes (sediment circulation or deposition patterns); and
 - temporary changes in water quality (water and/or sediment quality).

Table 3, Mitigation measures as secured in the DCO/DML

Mitigation/monitoring measure	Where these measures are secured in the DCO/DML
Cowling/shields on site and jetty lighting to ensure the envelope of potentially significant effects accords with the maximum zone of influence assumed in the HRA.	DCO Requirement for final lighting strategy to be approved by Thurrock Council, and to be in accordance with Preliminary Lighting Strategy [APP-044], the key figure from which is reproduced within this HRA report; and also the CEMP (Chapters 5, 6, and 7).
Embedded mitigation to reduce the spatial influence of effects from noise and vibration (ES Chapter 17, Document Reference 6.1 [APP-031]) and ensure the envelope of potentially significant effects accords with the maximum zone of influence assumed in the HRA.	OMP (Section 6), CEMP (Chapter 10), and noise barriers (secured through DCO requirement).
Embedded mitigation to reduce the spatial influence of effects from dust and emissions (ES Chapter 18) and ensure the envelope of potentially significant effects accords with the maximum zone of influence assumed in the HRA.	OMP (Section 7), CEMP (Chapter 11)
Embedded mitigation to reduce the spatial influence of effects from surface water pollution (ES Chapters 15 and 16) and ensure the envelope of potentially significant effects accords with the maximum zone of influence assumed in the HRA.	Drainage Strategy [APP-090], and CEMP (Chapter 9).
Embedded mitigation to reduce the spatial influence of benthic sediment mobilisation and re-deposition and ensure the envelope of potentially significant effects accords with the maximum zone of influence assumed in the HRA.	CEMP (Chapter 7), Operation of the DML conditions on construction and maintenance dredging.
Sampling of sediments to reduce the spatial influence of potential contaminants during maintenance dredging.	Operation of the DML conditions on maintenance dredging.

- 5.12 The following paragraphs within this section detail the Secretary of State's considerations and conclusions to the points raised in response to the REIS by NE and the Applicant.

Noise Disturbance to birds utilising functionally-linked inter-tidal habitat

- 5.13 The Applicant's Shadow HRA Stage 2 Report acknowledged 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.
- 5.14 NE considered that they were unable to agree that disturbance to birds utilising functionally linked habitat would not result in AEOL as there was no consensus on the value of functionally linked land and the zones of influence from noise disturbance.
- 5.15 With regard to the value of functionally linked land, this view was on the basis of results and conclusion of two bird surveys, conducted by the Applicant (Shadow HRA and an additional wintering bird survey conducted between

February and March 2018, the results of which were incorporated into a revised Bird Note in the Applicant's shadow Stage 2 HRA Report). However, whilst NE disagreed with the content of the additional bird survey, the Statement of Common Ground between the Applicant and NE at Deadline 7 set out that:

"the package of contextual detail on the use of the intertidal areas by wintering birds (the "bird note") adequately addresses any perceived shortfall, and as part of the environmental information before the examination, provides an adequate basis for determination. It also provides an adequate basis from which to assess the potential for 'adverse effect on integrity' in relation to bird populations using habitats functionally linked to the Thames Estuary and Marshes SPA/Ramsar".

- 5.16 With regard to NE's concerns about the zone of influence, as set out at paragraph 4.6, the Applicant carried out a sensitivity test on its initial findings in their Shadow HRA to address NE's concerns. The sensitivity test findings confirmed the 300m zone of influence. The Secretary of State notes that NE had not commented on this by the close of examination.
- 5.17 NE suggested that piling works should be avoided between September and the end of March, to mitigate noise impacts on SPA and Ramsar birds. The Applicant concluded that it was unlikely that displacement due to disturbance emanating from the Development site could have consequences for the Thames Estuary and Marshes SPA or Ramsar Site populations, or indeed significant physiological consequences for any individual birds or collective assemblages of individuals or mixed species agglomerations. The Applicant further disputed the need for a seasonal timing restriction for piling activities on the basis that NE had not provided any data to support the recommendation.
- 5.18 To provide reassurance with regard to construction noise, the Applicant did however commit to a programme of continuing wintering and passage bird surveys (between September and April). These surveys were described within the Bird Monitoring and Action Plan ("BMAP") which would include trigger levels dictating the need for more intense monitoring followed by key stakeholder notification if such levels were breached. A breach would also require the Applicant to cease temporarily any activities deemed to be disturbing relevant features and resulting in significant effects. The Applicant stressed that this monitoring was not necessary to support a conclusion of no AEOI and that it should be considered akin to a routine post-construction monitoring for verification purposes. The final Statement of Common Ground between the Applicant and NE set out that NE welcomed this measure.
- 5.19 The Secretary of State agrees with the Panel that no persuasive evidence has been provided to demonstrate that the value of functionally linked land is any higher than that suggested by the Applicant. The Secretary of State therefore agrees with the Panel and concludes that the area most likely to experience construction or operational noise impacts emanating from the Development site would support significantly less than 1% of the bird populations relevant to the Thames Estuary and Marshes SPA/Ramsar Site. The Secretary of State also agrees with the Panel that no evidence has been presented to suggest that a disturbance impact of this scale would have a discernible effect on the overall population and distribution of the qualifying features of the Thames Estuary and

Marshes SPA or Ramsar Site. Having regard to the relevant conservation objectives of the Thames Estuary and Marshes SPA, the Secretary of State also agrees with the Panel that the integrity of the site would be adversely affected.

- 5.20 Whilst the Secretary of State notes that NE could not agree to no AEOL as they considered that mitigation in the form of piling restrictions is necessary, based on the evidence presented above the Secretary of State is of the opinion that there would not be AEOL from the Development alone and is satisfied that no evidence has been provided that additional piling restrictions are necessary (above that which is specified in condition 12(2) of the DML). Whilst the Secretary of State is content that the BMAP is not necessary to conclude that there will be no AEOL resulting from noise and has therefore placed no weight on it, the Secretary of State welcomes its inclusion as secured through the DCO at requirement 11 of Schedule 2.
- 5.21 **The Secretary of State is satisfied that no AEOL exists with regards to disturbance to birds utilising functionally-linked habitat, based on the embedded mitigation measures (OMP and the CEMP) through requirements 4 and 11 within the DCO, together with conditions within the DML (Schedule 9 to the DCO).**

Damage to habitats and species

Loss of functionally linked habitat – Coastal saltmarsh or intertidal mudflats

- 5.22 It has been determined that there would be a temporary loss of 0.0355ha of intertidal habitat (comprising 255.1m² of intertidal mudflat and 99.4m² of coastal saltmarsh), which could have implications for wading birds and waterfowl and insect and plant qualifying features of the European sites. The Applicant proposed to create new saltmarsh and mudflat habitat within the Order Limits to offset the minor losses as secured through the certified Ecological Management and Compensation Plan. However, the Marine Management Organisation (“MMO”) highlighted that the creation of a new saltmarsh habitat would be compensation and as such the Applicant could not conclude no AEOL.
- 5.23 The Secretary of State notes that NE considered that loss of functionally linked habitat from the project alone was likely to be relatively small. The Secretary of State agrees with the Panel’s Report that the anticipated loss of 0.0355ha (0.0315ha lost permanently and 0.004ha taken temporarily during construction) of functionally linked intertidal habitat, which is not located within the European site itself, is of such a small scale that the conservation objectives of the Thames Estuary and Marshes SPA would not be undermined. The Secretary of State does not consider that any further evidence has been presented to suggest that a disturbance impact of this scale would have a discernible effect on the overall population and distribution of the qualifying features of the SPA.
- 5.24 In addition the Applicant has confirmed that there would be no functional linkage between the European sites and the Coastal and floodplain grazing marsh and so the Secretary of State has not considered this further.

- 5.25 **Therefore, the Secretary of State concludes that there would be no AEOL to the designated sites resulting from a loss coastal saltmarsh and intertidal habitat irrespective of the proposed on-site provision for new saltmarsh and intertidal habitat.**

Sediment circulation or deposition patterns and water and / or sediment quality

- 5.26 NE disputed the Applicant's HRA Stage 2 Report's conclusion that the adoption of non-dispersive capital dredge methods for contaminated areas of the approach channel (secured through paragraph 3(4) of the DML) would obviate impacts leading to AEOL from changes to water and/or sediment quality.
- 5.27 NE disagreed with this conclusion and considered that more information was needed about the dredging methodology and taking a precautionary position, any initial capital dredging should not be undertaken during the 10 month period of July to April. NE also considered that a sediment monitoring programme should be undertaken to establish the sediment movement, accretion and contamination levels to supporting habitats arising from initial dredging. The Secretary of State notes that the Applicant predicted that capital and maintenance dredging would give rise to localised and temporary increases in sediment depositions which would be within the range of annual fluctuations in this part of the river Thames and that they predicted a low risk of significant effects from mobilisation of potential contaminants. The Secretary of State does not consider that any evidence has been provided to dispute this conclusion. This view is supported by the MMO statement, "The MMO has not received any concerns regarding water quality from the Environment Agency" (MMO Written Response).
- 5.28 NE also disputed that Applicant's conclusion that there would be no AEOL resulting from sediment plume from capital and maintenance dredging. This conclusion was based on modelling but NE considered that models were at best predictions and needed to be ground-truthed. The Secretary of State agrees with the Panel that modelling is of a predictive nature but does not consider that specific concerns have been raised by NE that would undermine the Applicant's approach to assessment or indicate that the conclusions are inaccurate.
- 5.29 The Secretary of State is satisfied that the Applicant has provided sufficient and robust analysis of sediment disturbance and dispersal and potential contamination, associated with the capital and maintenance dredging works for the Secretary of State to be persuaded that the structure and function of the habitats of the qualifying features and the supporting processes on which they rely would not be affected.
- 5.30 The Secretary of State considers that the following embedded mitigation measures secured through the DCO are sufficient to ensure no AEOL on the Thames Estuary and Marshes SPA/Ramsar Site resulting from sediment circulation or deposition patterns and water and/or sediment quality and that no evidence has been provided to suggest that further mitigation measures are necessary:

- Water Injection Dredging (“WID”), (rather than backhoe dredging), during both the capital and maintenance dredging to be restricted to the ebb tide only;
- no WID to be carried out between June and August;
- sediment with elevated levels of contaminants within the approach channel to be backhoe-dredged to create minimal disturbance of the sediment;
- material extracted from backhoe dredging to not be disposed of at sea; and
- no WID to be undertaken within an exclusion zone in the approach channel.

The Secretary of State considered that these embedded mitigation measures (which would be secured through Condition 10 of the DML) are appropriate. In addition, Secretary of State considers that paragraph 1 of condition 10 of the DML requiring the Applicant to consult with NE (and the EA) before submitting a construction method statement to the MMO would provide additional safeguards.

- 5.31 **The Secretary of State considers that with the proposed mitigation measures in place, there would be no AEOL from sediment circulation or deposition patterns and water / sediment quality on the Thames Estuary and Marshes SPA/Ramsar Site.**

The Integrity Test – In-combination effects

- 5.32 The potential for in-combination impacts from the proposed Development together with TEC and LEC was assessed within the Applicant’s integrity assessment (as assessed in Annex 3). The following in-combination effects were included in this assessment:

- disturbance during operation from increased shipping movements;
- displacement of birds from intertidal habitats;
- changes to air quality from shipping emissions;
- effects on estuarine processes;
- effects from INNS; and
- loss of functionally linked habitat.

- 5.33 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”. However, NE disputed this and could not agree to a finding of no AEOL for the following specific in-combination effects:

- displacement of birds from the intertidal area;
- 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; and
- loss of functionally linked habitat.

Displacement of birds from intertidal area

- 5.34 The Applicant’s Shadow HRA Stage 2 Report concluded that additive disturbance impacts would be significantly ameliorated by:

- the relatively limited number of projects that are likely to have overlapping construction phases;
 - 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.
- 5.35 The Applicant concluded there would not be an AEOI on the Thames Estuary and Marshes SPA and Ramsar Site from in-combination displacement effects to birds using intertidal habitats. NE disputed this conclusion based on the in-combination assessment being limited to overlapping impacts and that consideration should be given to prolonged disturbance to functionally linked land caused by concurrent or successive development activities. NE also considered that timing the works that have the potential to cause bird disturbance to avoid the sensitive over-wintering period would negate an impact both alone and in-combination.

Estuarine processes

- 5.36 The Applicant's ES concluded that increases in suspended sediments from other projects in the vicinity would generally be small scale. The ES considered that co-ordination of dredging activities could reduce potential effects.
- 5.37 The Applicant also acknowledged the potential for in-combination impacts from dredging activities between the proposed Development of LTC and TEC and from the discharge of cooling water at the TEC. The impacts would be to water and/or sediment quality, but these impacts were not quantified as there was a lack of detailed information regarding the other developments.
- 5.38 The Applicant's HRA Stage 2 Report concluded that the potential influence of the proposed Development on estuarine processes would be negligible and therefore significant in-combination effects were not likely, regardless of the magnitude of effects arising elsewhere. The Applicant concluded that adverse in-combination effects on estuarine processes on the integrity of the Thames Estuary and Marshes SPA and Ramsar Site were unlikely. NE did not agree to no AEOI and stated that further consideration was required to address uncertainties relating to sedimentation and pollution risk. However, NE's final letter (3 August 2018) stated 'that we are not pursuing what we consider to be an insurmountable objection with regards to impacts on European Sites'.

Loss of functionally linked habitat

- 5.39 The Applicant explained that the extent of loss to functionally linked habitat cannot be properly defined for either TEC or LTC at this stage because the details of those proposals were not yet available and that 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. NE responded that based on the information available it still considered an AEOI in-combination could not be ruled out. The Panel however noted that no specific reasons were provided relating to the loss of functionally linked habitat.

The Integrity Test – In-combination effects Conclusion

Displacement of birds from intertidal area

- 5.40 The Applicant's HRA Stage 2 Report concluded that additive disturbance impacts would be significantly ameliorated by:
- the relatively limited number of projects that are likely to have overlapping construction phases;
 - anticipated construction periods for the Development, TEC and LTC (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.
- 5.41 The Secretary of State accepts NE's concerns that there could be some potential for prolonged noise disturbance (resulting in displaced birds), at functionally linked habitat resulting from successive developments. However, the Secretary of State notes that LTC is at an early stage and that TEC is not being progressed. Therefore whilst the Secretary of State considered that there is the potential for in-combination effects to arise in the future, he is satisfied that the Applicant's in-combination assessment is based on the most currently available information and that no evidence has been provided to dispute the Applicant's conclusion that in-combination effects resulting from noise disturbance will lead to no AEOI on the Thames Estuary and Marshes SPA and/or Ramsar Site. Further the Secretary of State is satisfied that as more detail of other projects come forward, it will be for the applicant of those schemes and the relevant competent authority to consider in combination effects at that time.

Estuarine processes

- 5.42 The Applicant's HRA Stage 2 Report concluded that the potential influence of the Development on estuarine processes would be negligible and that in-combination effects were not likely. It further stated that the adoption of measures to prevent significant mobilisation of polluted sediments, the controls imposed by dredging regulators and the ability of the Port of London Authority ("PLA") to control dredging in the area would mean a negligible potential contribution to any cumulative water quality effect arising from other marine works projects or dredging activities. The Applicant therefore concluded that adverse in-combination effects on estuarine processes and the integrity of the Thames Estuary and Marshes SPA and Ramsar Site were unlikely. NE however considered that further consideration was required to address uncertainties relating to sedimentation and pollution risk and that they could not therefore agree to no AEOI.
- 5.43 The Secretary of State agrees with the Panel that no evidence has been provided to refute the findings of the Applicant's assessment and is content that the findings from the Applicant's in-combination impacts from dredging assessment is based on currently available information that can be relied upon and that its findings are sufficiently supported. The Secretary of State is

therefore satisfied that there will be no AEOI resulting from capital or maintenance dredging (with embedded mitigations in place) to the Thames Estuary and Marshes SPA or Ramsar Site.

- 5.44 In addition, the dredging works would require approval from the PLA under its protective provisions in Part 3 of Schedule 10 to the DCO and that it could impose restrictions as necessary. The PLA would also have input into the detailed design for the authorised Development as it would have oversight from other projects and could provide input to the MMO on co-ordinating activities, thus addressing the potential in-combination AEOI as information becomes available. This would provide additional reassurance and safeguard the in-combination developments from impacting the Thames Estuary and Marshes SPA or Ramsar Site.

Loss of functionally linked habitat

- 5.45 The Secretary of State considers that there is a potential for loss of functionally linked habitat. However, as it has been established that direct loss to functionally-linked land within the Order limits of the Development is very small (0.0355ha), any in-combination contribution would be minimal (without considering the TEC 'project will not be progressed').
- 5.46 **Based on currently available information and assessments conducted to date and with embedded mitigations in place, the Secretary of State considers the proposed development would have no AEOI from in-combination effects.**

6. Conclusions

- 6.1 The Secretary of State concludes that the construction and operation of the Development, as proposed, with all the avoidance and mitigation measures secured in the DCO, including the DML, being implemented in full, will not adversely affect the integrity of the Thames Estuary and Marshes SPA, or the Thames Estuary and Marshes Ramsar Site or the functionally-linked land associated with these sites either alone or in-combination with any other project or plans.
- 6.2 The Secretary of State notes NE's final response letter at Deadline 7 (3 August 2018) stating "*....Natural England advises that there should not be a need to proceed to Stage 3 or 4 as we are not pursuing what we consider to be an insurmountable objection with regards to impacts on European Sites. We consider that the Stage 2 assessment should identify appropriate works, timings and mitigation options to ensure that there are no Adverse Effect on Integrity ('AEOI') particularly during the construction period.*" The Secretary of State considers that the Appropriate Assessment (Stage 2) in this report aligns to this statement and concludes that there are no AEOI associated with the Development.
- 6.3 The Secretary of State is content that the construction and operation of the Development, as proposed, with all the avoidance and mitigation measures secured in the DCO, including the DML, being implemented in full, will not adversely affect the integrity of the Thames Estuary and Marshes SPA, the Thames Estuary and Marshes Ramsar Site or the functionally-linked land associated with these sites either alone or in-combination with any other project or plans.
- 6.4 In this circumstance, the Secretary of State agrees with the Panel that there is no requirement to progress to Stages 3 and 4 of the HRA process.

Annex 1: Potential effects

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
	<ul style="list-style-type: none"> outside designation boundary) • 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) 	
Thames Estuary and Marshes Ramsar site only	<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

x = LSE **can** be excluded

C = construction

O = operation

D = decommissioning

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 NSIP: c.1.5km															
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>	x _a	x _b	x _l	✓ _c	x _f	x _l	✓ _g	✓ _g	x _l	✓ _h	✓ _h	x _l	✓ _k	✓ _k	x _l
<i>Article 4.1 qualifying feature: Hen Harrier (winter)</i>	x _a	x _b	x _l	x _d	x _d	x _l	✓ _g	✓ _g	x _l	✓ _h	✓ _h	x _l	✓ _k	✓ _k	x _l
<i>Article 4.2 qualifying feature: Ringed Plover (passage)</i>	x _a	x _b	x _l	✓ _c	x _f	x _l	✓ _g	✓ _g	x _l	✓ _h	✓ _h	x _l	✓ _k	✓ _k	x _l
<i>Article 4.2 qualifying feature: Grey Plover (winter)</i>	x _a	x _b	x _l	✓ _c	x _f	x _l	✓ _g	✓ _g	x _l	✓ _h	✓ _h	x _l	✓ _k	✓ _k	x _l
<i>Article 4.2 qualifying feature: Knot (winter)</i>	x _a	x _b	x _l	x _e	x _f	x _l	✓ _g	✓ _g	x _l	✓ _h	✓ _h	x _l	✓ _k	✓ _k	x _l
<i>Article 4.2 qualifying feature: Dunlin (winter)</i>	x _a	x _b	x _l	✓ _c	x _f	x _l	✓ _g	✓ _g	x _l	✓ _h	✓ _h	x _l	✓ _k	✓ _k	x _l

<i>Article 4.2 qualifying feature: Black-tailed Godwit (winter)</i>	x a	x b	x l	✓ c	x f	x l	✓ g	✓ g	x l	✓ h	✓ h	x l	✓ k	✓ k	x l
<i>Article 4.2 qualifying feature: Redshank (winter)</i>	x a	x b	x l	✓ c	x f	x l	✓ g	✓ g	x l	✓ h	✓ h	x l	✓ k	✓ k	x l
<i>Article 4.2 qualifying feature: Total waterfowl (winter)</i>	x a	x b	x l	✓ c	x f	x l	✓ g	✓ g	x l	✓ h	✓ h	x l	✓ k	✓ k	x l

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	Likely effects of NSIP																	
<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>	xl	xl	xl	xl	xl	xl	✓g	✓g	xl	✓h	✓h	xl	✓j	✓j	xl	✓k	✓k	xl
<i>Criterion 5 qualifying feature: Total waterfowl (winter)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xl	xl	xl	✓k	✓k	xl
<i>Criterion 6 qualifying feature: Ringed Plover (passage)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xl	xl	xl	✓k	✓k	xl
<i>Criterion 6 qualifying feature: Black Tailed Godwit (passage)</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xl	xl	xl	✓k	✓k	xl
<i>Criterion 6 qualifying feature: Grey Plover</i>	xa	xb	xl	✓c	xf	xl	✓g	✓g	xl	✓h	✓h	xl	xl	xl	xl	✓k	✓k	xl

(winter)																		
Criterion 6 qualifying feature: Knot (winter)	x a	x b	x l	x e	x f	x l	✓ g	✓ g	x l	✓ h	✓ h	x l	x l	x l	x l	✓ k	✓ k	x l
Criterion 6 qualifying feature: Dunlin (winter)	x a	x b	x l	✓ c	x f	x l	✓ g	✓ g	x l	✓ h	✓ h	x l	x l	x l	x l	✓ k	✓ k	x l
Criterion 6 qualifying feature: Redshank (winter)	x a	x b	x l	✓ c	x f	x l	✓ g	✓ g	x l	✓ h	✓ h	x l	x l	x l	x l	✓ k	✓ k	x l

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 *Malachiuss 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.

Annex 3: 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														
<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>
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>							x b	x b		x b	x b		x c	x c		? d	? d	
<i>Criterion 5 qualifying feature: Total waterfowl (winter)</i>				? a			x b	x b		x b	x b					? d	? d	
<i>Criterion 6 qualifying feature: Ringed Plover (passage)</i>				? a			x b	x b		x b	x b					? d	? d	
<i>Criterion 6 qualifying feature: Black Tailed Godwit (passage)</i>				? a			x b	x b		x b	x b					? d	? d	
<i>Criterion 6 qualifying feature: Grey Plover</i>				? a			x b	x b		x b	x b					? 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

Annex 4: Conservation objectives for Thames Estuary and Marshes SPA and the Thames Estuary and Marshes Ramsar Site



European Site Conservation Objectives for Thames Estuary and Marshes Special Protection Area Site Code: UK9012021

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

- A082 *Circus cyaneus*; Hen harrier (Non-breeding)
 - A132 *Recurvirostra avosetta*; Pied avocet (Non-breeding)
 - A137 *Charadrius hiaticula*; Ringed plover (Non-breeding)
 - A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
 - A143 *Calidris canutus*; Red knot (Non-breeding)
 - A149 *Calidris alpina alpina*; Dunlin (Non-breeding)
 - A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
 - A162 *Tringa totanus*; Common redshank (Non-breeding)
- Waterbird assemblage

This is a European Marine Site

This SPA is a part of the Thames Estuary and Marshes European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Regulation 35 Conservation Advice document for the EMS. For further details about this please visit the Natural England website at: <http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx> or contact Natural England's enquiry service at enquiries@naturalengland.org.uk or by phone on 0845 600 3078.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 30 June 2014 (Version 2). This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014. Previous references to additional features identified in the 2001 UK SPA Review have also been removed.

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 31 March 2000

3. Country:

UK (England)

4. Name of the Ramsar site:

Thames Estuary and Marshes

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

**** Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

Ramsar Information Sheet: UK11069

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Thames Estuary and Marshes

Produced by JNCC: Version 3.0, 13/06/2008

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ;
- ii) an electronic format (e.g. a JPEG or ArcView image) *Yes*
- iii) a GIS file providing geo-referenced site boundary vectors and attribute tables *yes* ✓ -or- *no* ;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 29 08 N 00 35 47 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Gravesend

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

45118 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:

Ringed plover, *Charadrius hiaticula*, 595 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)

Black-tailed godwit, *Limosa limosa islandica*, 1640 individuals, representing an average of 4.6% of the population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Grey plover, *Pluvialis squatarola*, E Atlantic/W Africa -wintering 1643 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9-2002/3)

Red knot, *Calidris canutus islandica*, W & Southern Africa (wintering) 7279 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3)

Dunlin, *Calidris alpina alpina*, W Siberia/W Europe 15171 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)

Common redshank, *Tringa totanus totanus*, 1178 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

Details of bird species occurring at levels of National importance are given in Section 22

Soil & geology	alluvium, mud, shingle
Geomorphology and landscape	coastal, floodplain, intertidal sediments (including sandflat/mudflat), estuary
Nutrient status	eutrophic
pH	no information
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent, usually seasonal / intermittent
Summary of main climatic features	Annual averages (Greenwich, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/greenwich.html) Max. daily temperature: 14.8° C Min. daily temperature: 7.2° C Days of air frost: 29.1 Rainfall: 583.6 mm Hrs. of sunshine: 1461.0

General description of the Physical Features:

The marshes extend for about 15 km along the south side of the Thames estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea-wall, there is a small extent of saltmarsh and broad intertidal mudflats.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The marshes extend for about 15 km along the south side of the Thames estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea-wall, there is a small extent of saltmarsh and broad intertidal mudflats.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces, Sediment trapping, Flood water storage / desynchronisation of flood peaks, Maintenance of water quality (removal of nutrients)

19. Wetland types:

Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	49.6
4	Seasonally flooded agricultural land	38.6
Q	Saline / brackish lakes: permanent	4.2
Ss	Saline / brackish marshes: seasonal / intermittent	3.2
Other	Other	1.6
H	Salt marshes	1.3
E	Sand / shingle shores (including dune systems)	0.8
O	Freshwater lakes: permanent	0.7

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The intertidal flats are mostly fine, silty sediment, though in parts they are sandy. The saltmarsh shows a transition from pioneer communities containing *Zostera* to saltmarsh dominated by, for example, *Atriplex portulacoides*. The grazing marsh grassland is mesotrophic and generally species-poor. It does, however, contain scattered rarities, mostly annuals characteristic of bare ground. Where the grassland is seasonally inundated and the marshes are brackish the plant communities are intermediate between those of mesotrophic grassland and those of saltmarsh. The grazing marsh ditches contain a range of flora of brackish and fresh water. The aquatic flora is a mosaic of successional stages resulting from periodic clearance of drainage channels. The dominant emergent plants are *Phragmites communis* and *Bolboschoenus maritimus*. The saline lagoons have a diverse molluscan and crustacean fauna. Dominant plants in the lagoons include *Ulva* and *Chaetomorpha*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

Nationally important species occurring on the site:

Higher plants:

The site supports a population of the endangered least lettuce *Lactuca saligna*, and also supports several nationally scarce plants, including bulbous foxtail *Alopecurus bulbosus*, slender hare's-ear *Bupleurum tenuissimum*, divided sedge *Carex divisa*, saltmarsh goosefoot *Chenopodium chenopodioides*, sea barley *Hordeum marinum*, golden samphire *Inula crithmoides*, annual beard grass *Polypogon monspeliensis*, Borrer's saltmarsh-grass *Puccinellia fasciculata*, stiff saltmarsh-grass *P. rupestris*, one-flowered glasswort *Salicornia pusilla*, clustered clover *Trifolium glomeratum*, sea clover *T. squamosum*, narrow-leaved eelgrass *Zostera angustifolia* and dwarf eelgrass *Z. noltei*.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

Birds

Species currently occurring at levels of national importance:

Species with peak counts in spring/autumn:

Little grebe, <i>Tachybaptus ruficollis ruficollis</i> , Europe to E Urals, NW Africa	251 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9-2002/3)
Little egret, <i>Egretta garzetta</i> , West Mediterranean	54 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff, <i>Philomachus pugnax</i> , Europe/W Africa	23 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank, <i>Tringa nebularia</i> , Europe/W Africa	38 individuals, representing an average of 6.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Common shelduck , <i>Tadorna tadorna</i> , NW Europe	1238 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Gadwall , <i>Anas strepera strepera</i> , NW Europe	359 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , <i>Anas chryseata</i> , NW & C Europe	288 individuals, representing an average of 1.9% of the GB population (5 year peak mean 1998/9-2002/3)
Water rail , <i>Rallus aquaticus</i> , Europe	6 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , <i>Recurvirostra avosetta</i> , Europe/Northwest Africa	607 individuals, representing an average of 17.8% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	6 individuals, representing an average of 4.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site:

Invertebrates:

The endangered species *Bagous longitarsis* occurs on the site.

The following vulnerable species occur on the site: a groundbug *Henestaris halophilus*, a weevil *Bagous cylindrus*, a ground beetle *Polystichus connexus*, a crane fly *Erioptera bivittata*, a crane fly *Limnophila pictipennis*, a horse fly *Hybomitra expollicata*, a hoverfly *Lejops vittata*, a dancefly *Poecilobothrus ducalis*, a snail-killing fly *Pteromicra leucopeza*, a solitary wasp *Philanthus triangulum* and a damselfly *Lestes dryas*.

The following rare species occur on the site: a ground beetle *Anisodactylus poeciloides*, the water beetles *Aulacochthebius exaratus*, *Berosus fulvus*, *Cercyon bifeneistratus*, *Hydrochus elongatus*, *H. ignicollis*, *Ochthebius exaratus* and *Hydrophilus piceus*, a beetle *Malachius vulneratus*, a rove beetle *Philonthus punctus*, a fungus beetle *Telmatophilus brevicollis*, a fly *Campsicnemus magius*, a horsefly *Haematopota bigoti*, a soldier fly *Stratiomys longicornis* and a spider *Baryphyma duffeyi*.

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic

Archaeological/historical site

Environmental education/ interpretation

Fisheries production

Livestock grazing

Non-consumptive recreation

Scientific research

Sport fishing

Sport hunting

Tourism

Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
Private	+	+
Public/communal	+	

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	+
Fishing: commercial	+	
Fishing: recreational/sport	+	
Gathering of shellfish	+	
Bait collection	+	
Arable agriculture (unspecified)		+
Permanent arable agriculture		+
Livestock watering hole/pond	+	+
Grazing (unspecified)	+	+
Permanent pastoral agriculture	+	+
Hunting: recreational/sport	+	
Industrial water supply		+
Industry		+
Sewage treatment/disposal	+	+
Harbour/port	+	+
Flood control	+	
Transport route	+	+
Urban development		+
Military activities	+	

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Dredging	1		+	+	+
Erosion	2		+		+
Eutrophication	2	Studies by the Environment Agency indicate that the waters in the Thames estuary are hyper-nitrified for nitrogen and phosphorus.	+	+	+
General disturbance from human activities	1		+		+

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Erosion - The North Kent Coastal Habitat Management Plan (CHaMP) has been produced. The Environment Agency is producing a Flood Defence Strategy for the Thames (Thames 2100) and decisions on future flood risk management will need to take into account the effects on features within the designated sites.

Studies of sediment transport and hydrodynamics within Thames estuary. Investigation of beneficial use of dredgings for mudflat recharge and creation of compensatory habitat.

Eutrophication - Water quality and sources of nutrient inputs are subject to further investigation by the Environment Agency as part of the Agency's review of consents under the Habitats Regulations. Stage 3 of the Review of Consents (appropriate assessment) is scheduled for completion by March 2006, at which point any consented discharges having an adverse effect on site integrity will be identified.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
Special Protection Area (SPA)	+	

Land owned by a non-governmental organisation for nature conservation	+	+
Management agreement	+	
Site management statement/plan implemented	+	
Environmentally Sensitive Area (ESA)	+	+

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl and Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Numbers of breeding waders have been monitored through the BTO/RSPB/English Nature/Defra survey Breeding Waders of Wet Meadows (2002).

Botanical surveys of vegetation of sea wall embankments and grazing marsh ditches have been carried out.

The distribution and extent of saltmarsh habitat has been mapped - North Kent Marshes Saltmarsh Survey (2002) (Blair-Myres 2003)

The RSPB monitors various species groups on its reserves within the site

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The RSPB manages a network of reserves within and adjacent to the site, which are promoted locally through existing community initiatives, and more widely through publications and via the internet.

The site forms part of proposals for a north Kent 'Regional Park', being promoted to balance development in Kent Thameside (part of the Thames Gateway growth area). The Management Guidance for the Thames Estuary aims to increase awareness of conservation and is promoted by the Thames Estuary Partnership. The Thames Estuary Partnership has also produced the Tidal Thames Habitat Action Plan to raise awareness of and address biodiversity issues.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Yachting, angling, wildfowling, jet-skiing, water-skiing and birdwatching. Bird watching occurs throughout the year and wildfowling is restricted to the period September to February. The remaining activities occur year-round but are more prevalent in the summer months. Disturbance from these activities is a current issue but is being addressed through further research, negotiation and information dissemination.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House,
Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

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