

Chapter Twelve ◆ TERRESTRIAL AND FRESHWATER ECOLOGY AND BIODIVERSITY

INTRODUCTION

- 12.1 This chapter sets out a detailed assessment of the likely significant effects of the Proposed Development (as described in ES Chapter 3: *Project Description* (Document Reference 6.1.3)) on terrestrial and freshwater features of nature conservation value. In particular, it considers the likely effects of the Proposed Development on the Important Ecological Features (IEFs) identified within the Project Site or its potential zone of influence¹.
- 12.2 The Project Site comprises two parts including the ‘Kent Project Site’, which includes land on the Swanscombe Peninsula and the Ebbsfleet Valley on the south side of the River Thames centred approximately at Ordnance Survey Grid Reference (OSGR) TQ 606 758, and the ‘Essex Project Site’, which includes land to the east of the A1089 Ferry Road and the Tilbury Ferry Terminal centred approximately at OSGR TQ 643 752. The Project Site lies partly within three local planning authority areas: Dartford Borough and Gravesham Borough for the Kent Project Site; and Thurrock Council for the Essex Project Site. Collectively these two parts of the entire Development Consent Order DCO boundary are referred to as ‘the Project Site’.
- 12.3 The IEFs included within the assessment are described in detail in Appendix 12.1 *Ecology Baseline Report* (Document Reference 6.2.12.1) and summarised within the ‘Baseline Conditions’ section of this Chapter. Aquatic features in the Thames Estuary intertidal and subtidal environment are dealt with separately in ES Chapter 13: *Marine Ecology* (Document Reference 6.1.13).
- 12.4 The assessment has been prepared with reference to the Chartered Institute of Ecology and Environmental Management’s (CIEEM) ‘*Guidelines for Ecological Impact Assessment in the UK and Ireland*’ (CIEEM, 2018)², hereafter referred to as ‘the EclA Guidelines’. This chapter has been prepared and reviewed by experienced senior EDP Ecologists and full members of CIEEM.
- 12.5 This chapter describes:
- the methods used for the assessment;

¹ Zone of Influence - the area over which ecological features may be affected by biophysical changes as a result of the proposed development

² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

- a summary of the baseline conditions currently existing at the Project Site and in its surroundings;
- the likely direct and indirect effects arising from the Proposed Development during construction and operation;
- the measures proposed to avoid or mitigate likely significant negative effects;
- the assessment of residual effects taking into account the additional mitigation measures proposed;
- the measures proposed to compensate for those residual effects, which cannot be avoided or mitigated; and
- the assessment of potential cumulative and in-combination effects on ecological receptors.

12.6 This document supersedes the original ES Chapter, which was submitted with the DCO Application in late 2020. The key updates to the original ES Chapter and the supporting documentation are as follows:

- Updates to the baseline conditions and evaluation of important ecological features to reflect the notification of Swanscombe Peninsula SSSI (notified on 11 March 2021), which covers a large proportion of the Kent Project Site;
- Additional baseline information collected through site surveys since the original submission;
- Further clarification in respect of predicted direct and indirect effects upon important ecological features;
- Amendments to the proposals for on-site mitigation of impacts upon non-SSSI notified features, where these have potential to result in negative effects on SSSI notified features;
- Greater distinction made between avoidance and mitigation, and compensation;
- More detail in respect of proposed off-site habitat creation measures to mitigate (in the case of potential effects on off-site designated sites) or compensate (in the case of effects on on-site features) for negative effects on-site.

12.7 This Chapter should be read in conjunction with the following ES Appendices and Figures.

Appendices

- Appendix 12.1: *Ecology Baseline Report* (Document Reference 6.2.12.1), which includes full details of survey methods, results and a full set of associated drawings;
- Appendix 12.2: *Biodiversity Impact Assessment* (Document Reference 6.2.12.2), which presents the results of a formal calculation of the net change in biodiversity value resulting from the Proposed Development using a standardised Metric;
- Appendix 12.3: *Ecological Mitigation and Management Framework* (Document Reference 6.2.12.3), which describes in further detail the on-site ecological avoidance and mitigation measures proposed during the construction and operational stages of the Proposed Development;
- Appendix 12.4: *Shadow Habitats Regulations Assessment* (Document Reference 6.2.12.4), which sets out a detailed assessment of likely significant effects on European Sites resulting from the Proposed Development both in the absence of, and then with the inclusion of, mitigation, and, as a last resort, compensation measures;
- Appendix 12.5: *Consultation responses to the 2020 EIA Scoping request (Relevant to Terrestrial and Freshwater Ecology)*; Document Reference 6.2.12.5), includes copies of consultation responses and how the points raised have been addressed in the ES;
- Appendix 12.6: *Statutory consultee responses to the Preliminary Environmental Information Report (Relevant to Terrestrial and Freshwater Ecology)*; Document Reference 6.2.12.6), includes copies of consultation responses and how the points raised have been addressed in the ES;
- Appendix 12.7: *Non-statutory consultee responses to the Preliminary Environmental Information Report (Relevant to Terrestrial and Freshwater Ecology)*; Document Reference 6.2.12.7), includes copies of consultation responses and how the points raised have been addressed in the ES;
- Appendix 12.8: *Water Framework Directive (Screening) Assessment: River Ebbsfleet* (Document Reference 6.2.12.8), provides information in respect of an assessment of potential effects arising upon the River Ebbsfleet and associated aquatic communities with due regard to objectives of the Water Framework Directive;
- Appendix 12.9: *Arboricultural Impact Assessment* (Document Reference 6.2.12.9), evaluates the existing tree stock and identifies trees suitable for retention, and assesses the impacts on the existing stock from the Proposed Development;
- Appendix 12.10: *Ecological Compensation Framework* (Document Reference 6.2.12.10),
- Appendix 12.11: *Artificial Lighting Environmental Impact Assessment* (Document Reference 6.2.12.11), provides details on the artificial lighting strategy for the

Proposed Development together with the design criteria, recommendations and mitigation measures to avoid or mitigate undue light pollution or adverse impact upon the natural environment

- Landscape Strategy (Document Reference 6.2.11.7), provides the overall landscape and green infrastructure design for the Proposed Development covering a number of elements such as accessibility, habitat creation and ecology, hydrology and public facilities, and provides the basis for fully a detailed Soft Landscaping Scheme (SLS) to be prepared post-consent;
- Landscape Management Plan (Document Reference 6.2.11.8), provides the strategy for delivering landscape management, maintenance and monitoring within the site wide landscape, to ensure that the ecological habitats retained, created or enhanced provide long term benefits to wildlife throughout the operational period of the Proposed Development; and
- Public Rights of Way Assessment (Document Reference 6.2.11.9), considers the impacts resulting from the Proposed Development on existing Public Rights of Way (PRoW) and provides mitigation and/or enhancement measures to the PRoW network.

Figures

- Figure 12.1: Project Site Areas (Document Reference 6.3.12.1);
- Figure 12.2: Statutory Designations Plan (Document Reference 6.3.12.2);
- Figure 12.3: Non-Statutory Designations Plan (Document Reference 6.3.12.3);
- Figure 12.4: Extended Phase 1 Habitat Survey (Document Reference 6.3.12.4);
- Figure 12.5: Rare Plants Species Population Plan (Document Reference 6.3.12.5);
- Figure 12.6: River Ebbsfleet River Corridor Survey Plan (Document Reference 6.3.12.6);
- Figure 12.7: River Ebbsfleet River Habitat Survey Sections and Results (Document Reference 6.3.12.7);
- Figure 12.8: Breeding Bird Survey Plan (April 2020; Document Reference 6.3.12.8);
- Figure 12.9: Breeding Bird Survey Plan (May 2020; Document Reference 6.3.12.9);
- Figure 12.10: Breeding Bird Survey Plan (June 2020; Document Reference 6.3.12.10);

- Figure 12.11: Breeding Bird Survey Plan (July 2020; Document Reference 6.3.12.11);
- Figure 12.12: Preliminary Roost Assessment of Trees (Document Reference 6.3.12.12);
- Figure 12.13: Preliminary Roost Assessment of Buildings (Document Reference 6.3.12.13);
- Figure 12.14: Static Detector Locations and Bat Transect Routes (Document Reference 6.3.12.14);
- Figure 12.15: Bat Transect Survey Results (Document Reference 6.3.12.15);
- Figure 12.16: Bat Activity Results per Species (Document Reference 6.3.12.16);
- Figure 12.17: Bat activity heat maps (Document Reference 6.3.12.17);
- Figure 12.18: Dormouse Survey Nest Tube Locations and Previous Records (Document Reference 6.3.12.18);
- Figure 12.19: Dormouse Survey Results 2020 (Document Reference 6.3.12.19);
- Figure 12.20: Summary of Dormouse Survey Results 2020 (Document Reference 6.3.12.20);
- Figure 12.21: Water Vole Survey Results (Document Reference 6.3.12.21);
- Figure 12.22: Otter Survey Results (Document Reference 6.3.12.22);
- Figure 12.23: Harvest Mouse Survey Plan (Document Reference 6.3.12.23);
- Figure 12.24: GCN Survey Area (Document Reference 6.3.12.24);
- Figure 12.25: Reptile Survey Plan and Previous Records (Document Reference 6.3.12.25);
- Figure 12.26: Reptile Survey Results (Document Reference 6.3.12.26);
- Figure 12.27: Aquatic Macroinvertebrate Sample Locations (standing waterbodies; Document Reference 6.3.12.27);
- Figure 12.28: Aquatic Macroinvertebrate Survey Results (River Ebbsfleet) Spring 2020 (Document Reference 6.3.12.28);
- Figure 12.29: Aquatic Macroinvertebrate Survey Results (River Ebbsfleet) Autumn 2020 (Document Reference 6.3.12.29);

- Figure 12.30: Site Location Plan and Core Count Zones for Low and High Tide Surveys (Document Reference 6.3.12.30);
- Figure 12.31: Statutory Designations Recognised for Their Importance to Overwintering Birds (Document Reference 6.3.12.31);
- Figure 12.32: Winter Bird Survey Results – November 2019 (Document Reference 6.3.12.32);
- Figure 12.33: Winter Bird Survey Results – December 2019 (Document Reference 6.3.12.33);
- Figure 12.34: Winter Bird Survey Results – January 2020 (Document Reference 6.3.12.34)
- Figure 12.35: Winter Bird Survey Results – February 2020 (Document Reference 6.3.12.35);
- Figure 12.36: Winter Bird Survey Results – March 2020 (Document Reference 6.3.12.36);
- Figure 12.37: Vantage Point Survey Results – November 2019 (Document Reference 6.3.12.37);
- Figure 12.38: Vantage Point Survey Results – December 2019 (Document Reference 6.3.12.38);
- Figure 12.39: Vantage Point Survey Results – January 2020 (Document Reference 6.3.12.39);
- Figure 12.40: Vantage Point Survey Results – February 2020 (Document Reference 6.3.12.40);
- Figure 12.41: Vantage Point Survey Results – March 2020 (Document Reference 6.3.12.41);
- Figure 12.42: Biodiversity Impact Assessment – Existing Habitats (Document Reference 6.3.12.42);
- Figure 12.43: Biodiversity Impact Assessment – Proposed Habitats (Document Reference 6.3.12.43);
- Figure 12.44: Ecology Mitigation Strategy: Species Measures (Document Reference 6.3.12.44);

- Figure 12.45: Light Mitigation Strategy for Biodiversity (Document Reference 6.3.12.45);
- Figure 12.46: Locations of Other Nearby Dormouse Licenced Sites (Document Reference 6.3.12.46);
- Figure 12.47: Dormouse Habitat Suitability Assessment (Document Reference 6.3.12.47);
- Figure 12.48: Dormouse Habitat Impacts Plan (Document Reference 6.3.12.48);
- Figure 12.49: Desk Study Results Water Vole (Document Reference 6.3.12.49);
- Figure 12.50: Existing Hydrology (Document Reference 6.3.12.50);
- Figure 12.51: Predicted Impacts – Hydrology (Document Reference 6.3.12.51);
- Figure 12.52: Mitigation and Enhancements – Hydrology (Document Reference 6.3.12.52);
- Figure 12.55: Artificial Otter Holt – Location and Design (Document Reference 6.3.12.55);
- Figure 12.56: Tree Constraints Plan (Document Reference 6.3.12.56); and
- Figure 12.57: Tree Retention and Removal Plan (Document Reference 6.3.12.57).

METHODOLOGY AND DATA SOURCES

12.8 The assessment will follow the methodology provided in the EclA Guidelines. These Guidelines confirm that the ‘*EclA is a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems*’. The assessment methodology has been agreed through consultation on EIA Scoping and the Preliminary Environmental Information Report.

Consultation

EIA Scoping

12.9 An EIA Scoping Report was submitted to the Secretary of State (SoS) in June 2020. A Scoping Opinion was subsequently received from the SoS in July 2020, and the comments received have been used to inform the assessment. **Table 12.1** includes the Planning

Inspectorate’s comments from the 2020 EIA Scoping Opinion in relation to ecology, and the actions taken.

12.10 The comments received from statutory consultation bodies formally consulted by the Inspectorate in preparing the 2020 Scoping Opinion, and how the comments have been taken into consideration, are provided in Appendix 12.5 (Document Reference 6.2.12.5).

Table 12.1: Planning Inspectorate’s comments from the 2020 EIA Scoping Opinion in relation to Ecology (July 2020).

PINS ID	Applicant’s proposed matters to scope out	Inspectorate’s comments	Action taken
4.5.1	Effects on fish populations within the Thames Estuary, Swanscombe Marshes and the Ebbsfleet Stream	The Scoping Report seeks to scope out these effects on the grounds that survey information shows very few species within these areas. This appears to contradict the statement in paragraph 12.73 of the Scoping Report which states that surveys are proposed. Accordingly, the Inspectorate does not agree to scope this matter out. The ES should assess impacts to fish populations in the Thames Estuary, Swanscombe Marshes and the Ebbsfleet Stream where significant effects are likely to occur. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies including the Environment Agency.	An Ecology Briefing Note ‘Further Information in Respect of an EIA Scoping Opinion’ (Report ref: edp5988_r019) was submitted to EA on 13 August 2020 to provide further information on potential effects on a fish population within the river Thames, Swanscombe Marshes and River Ebbsfleet, and thus assess the requirement for further survey effort of each waterbody with respect to fish. The EA ‘Response to LR Ecology Briefing Note’ (Ref: KT/2020/127432/01-L01) received 15 September 2020 (see Appendix 12.5; Document Reference 6.2.12.5) confirmed additional fish surveys of the River Ebbsfleet were not required, with the existing baseline considered adequate to inform potential effects. Further surveys of the Swanscombe Marsh waterbodies were, however, progressed during September 2020 to confirm presence/absence of a notable fish population, particularly given the potential impacts in this area. The

PINS ID	Applicant's proposed matters to scope out	Inspectorate's comments	Action taken
			<p>surveys confirmed the absence of a notable fish population.</p> <p>It has been agreed with the MMO that subtidal fish surveys will not be required in the Thames Estuary. Inter-tidal fish surveys of the River Thames have been progressed, the results of which have informed Chapter 13: <i>Marine ecology and biodiversity</i> (Document Reference: 6.1.13) and the Water Framework Directive (WFD) assessment (Appendix 13.7; Document Reference 6.2.13.7).</p> <p>Although assessments of the River Ebbsfleet and Swanscombe Marshes have not identified any significant fish assemblages such that potential significant effects are unlikely, correspondence with the EA have confirmed a requirement to assess the potential for development to result in deterioration of each waterbody, and therefore each waterbody's potential to support a fish population in future. This assessment has now been completed (see Appendix 12.7; Document Reference 6.2.12.7)</p>
4.5.2	Selection of Important Ecological Features	The response from relevant consultation bodies identifies a number of receptors, including additional European sites and Sites of Special Scientific Interest, non-statutory wildlife sites and ancient woodland which are not included in the assessment. The assessment in the ES should be	The assessment has been updated to include additional receptors with potential to experience significant effects, as identified in the relevant consultation responses. This includes the inclusion of the Mucking Flats and Marshes SSSI, which is the underpinning SSSI for the Thames Estuary and Marshes SPA and Ramsar Site in Essex, as requested by Natural England. Furthermore, North Downs

PINS ID	Applicant's proposed matters to scope out	Inspectorate's comments	Action taken
		comprehensive with regards to all relevant receptors likely to experience significant effects. The Applicant should make effort to agree the relevant receptors for the assessment with consultation bodies.	Woodland SAC, and the underpinning Wouldham to Detling Escarpment SSSI, are now included within the assessment of potential air quality effects, as advised by Natural England. Open Mosaic Habitat on Previously Developed Land (OMHPDL) has been included as an IEF, as referred to by Thurrock Council.
4.5.3	Baseline conditions	Relevant consultation bodies have raised concerns regarding the proposed baseline data for the assessment in the Scoping Report. In particular concerns are raised in relation to the winter bird surveys required for the assessment of effects on designated sites. The Applicant should make effort to agree the scope and nature of baseline data required to support the assessment with relevant consultation bodies.	<p>The ES and shadow HRA (Appendix 12.4; Document Reference 6.2.12.4) submitted along with the DCO application is informed by a comprehensive suite of wintering, passage and breeding bird survey data collated during winter 2019/2020 through to spring 2020. In addition, this recent data is supplemented by a suite of 'baseline' surveys completed during 2012/2013 on behalf of London Resort Company Holdings (LRCH) Ltd. Two seasons of bird survey data is submitted along with the DCO application, albeit not in consecutive years.</p> <p>The wetland habitats within the Kent Project Site have not changed significantly in the intervening years between the 2012/2013 baseline surveys and the recent 2019/2020 surveys, and the data collected is more or less consistent across that time period. As set out in the ES the wintering wader/wildfowl assemblage using the Kent Project Site has been valued at the International level owing to its association with the nearby Ramsar and SPAs. The assemblage, which is treated as an Important Ecological Feature (IEF) in the Ecological Impact</p>

PINS ID	Applicant's proposed matters to scope out	Inspectorate's comments	Action taken
			<p>Assessment, has therefore being valued at the highest level, and data from additional surveys will not affect this valuation or significantly alter the impact assessment and mitigation measures being developed.</p> <p>To further assess the ornithological interest at the Project Site a comprehensive desk study, based on Wetland Bird Survey (WeBS) data and local record centre data, has been updated in 2020.</p> <p>A meeting was held to discuss these matters with Natural England on 10 August 2020, and further justification on the scope of surveys was provided to Natural England within an Ecology Briefing Note (edp5988_r022) issued 21 August 2020 (see Appendix 12.5; Document Reference 6.2.12.5). At the time of writing, no further comment has been made by Natural England in response to the Ecology Briefing Note.</p>
4.5.4	Temporal scope	The Scoping Report states that the assessment of ecological effects will be undertaken in the context of how the predicted baseline conditions might change between the surveys and the start of construction activities. The Scoping Report does not explain how this would be done, how it relates to the future baseline conditions referred to in paragraph 11.68 or if any additional survey work is proposed after consent prior to construction	The anticipated future baseline conditions in the absence of development are set out in this ES Chapter. Changes in baseline conditions between the surveys and start of construction activities are likely to be very minor over that relatively short time period, however such changes would be identified through updated surveys proposed as part of the pre-construction mitigation measures, and the avoidance/mitigation strategy adjusted if necessary.

PINS ID	Applicant's proposed matters to scope out	Inspectorate's comments	Action taken
		beginning. The ES should explain and justify any use of a future baseline.	

Preliminary Environmental Information Report (PEIR)

12.11 As part of its pre-application duties, the Applicant commenced a statutory public consultation in July 2020. A Preliminary Environmental Information Report (PEIR) was prepared in support of this process to assist consultees in understanding the potential environmental effects of the Proposed Development and to enable consultees to develop an informed view of the project, ahead of a DCO application being made.

12.12 Relevant comments received on the PEIR from statutory and non-statutory consultees, and how these have been addressed, are provided in Appendix 12.6 and Appendix 12.7 (Document References 6.2.12.6 and 6.2.12.7) respectively.

Consultation Meetings/Correspondence

12.13 In addition to the above, consultation has been held with parties with an interest or remit in biodiversity. **Table 12.2** provides a summary of the meetings and/or email/telephone correspondence with relevant consultees.

Table 12.2: Summary of consultation meetings and correspondence

Consultee	Details
Natural England, Environment Agency, Kent County Council, Dartford Borough Council, Gravesham Borough Council, Marine Management Organisation,	<ul style="list-style-type: none"> • Environmental Liaison Group meeting on 18 May 2020. Introductory meeting to re-introduce consultees to the proposals and the scope of survey and assessment to be undertaken to inform the DCO application.
Ebbsfleet Development Corporation, Gravesham Borough Council, Kent County Council, Natural England, Environment Agency,	<ul style="list-style-type: none"> • Green Infrastructure and Biodiversity Workshop, to provide consultees an opportunity to ask the project's ecology and landscape consultants questions about the approach to survey, assessment and design.
Natural England (NE)	<p><i>Prior to DCO Application Submission</i></p> <ul style="list-style-type: none"> • Email correspondence regarding terrestrial invertebrate survey methodology in late May and June 2020; • Meeting on 10 August 2020 to discuss NE response to EIA Scoping request;

Consultee	Details
	<ul style="list-style-type: none"> • Ecology Briefing Note ‘Natural England Consultation’ (Report ref: edp5988_r022) and ‘Consultation Issues Tracker’ submitted to NE on 21 August 2020 in response to matters discussed on 10 August 2020 and in response to NE’s EIA Scoping comments. Briefing note provided further information on how the mitigation hierarchy has been applied and further justification on the robustness of the wintering bird survey data; • ‘Marsh management’ meeting on 24 August 2020 along with the Environment Agency to discuss surface water drainage proposals, and proposed wetland creation, enhancement and management; • Second meeting on 24 August 2020 to discuss response to EIA Scoping request; • Meeting on 01 October 2020 to discuss NE response to PEIR; • Meeting on 16 October 2020 to discuss protected species licensing (water vole, otter, bat); and • Meeting on 20 October 2020 to discuss protected species licensing (dormouse). <p><i>Post DCO Application Submission</i></p> <ul style="list-style-type: none"> • Meeting on 24 February 2021 to acknowledge acceptance of the DCO Application by PINS and request feedback on mitigation strategies shared with NE prior to submission, in particular for invertebrates; • Meeting on 24 March 2021 to discuss recent notification of Swanscombe Peninsula SSSI and implications for on-site mitigation and off-site compensation, and to agree approach to further consultation prior to examination; • Series of topic-based meetings, informed by NE’s Relevant Representations on the DCO Application (dated 31 March 2021), during April and May 2021 as follows: <ul style="list-style-type: none"> ○ Breeding and wintering birds (22 April)

Consultee	Details
	<ul style="list-style-type: none"> ○ Vascular plants (22 April) ○ Invertebrates (28 April) ○ Protected species licensing (29 April) ○ HRA and EIA (06 May) <ul style="list-style-type: none"> ● Meeting on 07 March 2022 to discuss scope of updated documents
Environment Agency (EA)	<p><i>Prior to DCO Application Submission</i></p> <ul style="list-style-type: none"> ● Email correspondence regarding aquatic invertebrate survey methodology in late May 2020, and meeting 09 July 2020 to discuss requirements for Water Framework Directive assessment and Ecological Impact Assessment; ● ‘Marsh management’ meeting on 24 August 2020 along with NE to discuss surface water drainage proposals, and proposed wetland creation, enhancement and management; ● Ecology Briefing Note ‘Further Information in Respect of an EIA Scoping Opinion’ (Report ref: edp5988_r019) submitted to EA on 13 August 2020 to provide further information on potential effects on a fish population within the river Thames, Swanscombe Marshes and River Ebbsfleet, and requirements for water quality and Water Framework Directive assessment; and ● EA ‘Response to LR Ecology Briefing Note’ (Ref: KT/2020/127432/01-L01) received 15 September 2020 confirming additional fish survey on River Ebbsfleet not required.
Kent County Council	<ul style="list-style-type: none"> ● Meeting on 13 August 2020 to discuss ‘biodiversity elements’ of the Proposed Development with Helen Forster (Senior Biodiversity Officer); ● Email to Helen Forster on 14 September, 16 September and 01 October 2020 requesting information on dormouse mitigation strategies for approved developments in local area, along with information on existing dormouse monitoring/recording schemes.

Consultee	Details
Kent Wildlife Trust	<ul style="list-style-type: none"> Meeting to discuss ecological mitigation proposals on 24 June 2020 and 23 July 2020 with Richard Bloor and Nicky Britton-Williams (Wilder Towns Officer).
Buglife	<ul style="list-style-type: none"> Introductory meeting on 22 July 2020 with Jamie Robbins (Project Manager) to discuss scope of invertebrate surveys, approach to evaluation, and mitigation/compensation measures.

Identification of the Resource/Baseline Conditions

12.14 This assessment is based upon a review of the data obtained from previous ecology surveys, desk-based reviews and update ecology surveys undertaken between late 2019 and mid-2021, as discussed further below.

12.15 Collectively, findings from the above have been used to identify the important ecological features/receptors (IEFs) within the Project Site and its potential zone of influence, which has in turn been used to inform the masterplanning and mitigation strategy and form the basis for the assessment of potential effects.

Previous Ecology Assessment

12.16 The Kent Project Site has previously been subject to a suite of ecological baseline surveys as set out in various reports prepared in 2012 which were summarised within the 2014 EIA Scoping Report received by the Secretary of State in November 2014.

12.17 The 2012 reports are appended to EDP's Ecology Baseline Report (Appendix 12.1; Document Reference 6.2.12.1), and include:

- 2012 Desk Study and Phase I Habitat Survey Report (CBA, 2012);
- 2012 Botanical Survey Report (CBA, 2012);
- 2012 Amphibian Survey Report (CBA, 2012);
- 2012 Breeding Birds Survey Report (CBA, 2012);
- 2012 Terrestrial Invertebrate Survey Report (CBA, 2012);
- 2012 Terrestrial Invertebrate Survey Supplementary Report (Spiders [Araneae] and related groups) (CBA, 2012); and
- 2012/13 Wintering Birds Survey Report (CBA, 2013).

12.18 In addition, further surveys were undertaken on the Kent Project Site throughout 2015 and 2016, the findings of which are provided in full in the following reports:

- Phase 1 and Botanical Survey Report (CBA February 2016);
- Wintering Bird Survey Report (Corylus Ecology April 2016);
- Common Bird Survey Report (Corylus Ecology April 2016);
- Bat Activity Report 2015 (Corylus Ecology June 2016);
- Dormouse Report (Corylus Ecology February 2016);
- 2015 Harvest Mouse Survey Report (CBA February 2016);
- 2015 Water Vole Survey Report (CBA February 2016);
- 2015 Badger Survey Report (CBA February 2016);
- 2015 Amphibian Survey Report (CBA February 2016);
- 2015 & 2016 Reptile Survey Report (CBA August 2016);
- Invertebrate Survey and Assessment of the London Paramount Entertainment Resort 2015 (Edwards Ecological Services, 2015);
- An ecological survey of the waterbodies and wetlands on and around the Swanscombe Peninsula, Kent (Aseda, 2016); and
- A targeted ecological survey of selected waterbodies and wetlands on the Swanscombe peninsula, Kent (Aseda, 2016);
- Fish survey of Swanscombe Marshes (Colclough and Coates, 2015); and
- Fish survey of the Ebbsfleet Stream (Colclough and Coates, 2015).

12.19 These reports are appended in full, and the key findings summarised, within Appendix 12.1 (Document Reference 6.2.12.1).

2019-2021 Update Ecology Surveys

12.20 The update ecological information obtained for the Project Site by EDP is set out in detail within Appendix 12.1 (Document Reference 6.2.12.1). The appendix details the full survey methodologies that have been employed, any findings from surveys completed and

analysed and any limitations. It seeks to identify the IEFs within the Project's ecological zone of influence and defines the zone of influence for different receptors.

12.21 A summary of the update ecology surveys undertaken across the Project Site between 2019 and 2021 is provided below:

- Desk study (April 2020);
- Extended Phase 1 Habitat Survey (May 2020);
- Botanical survey (June 2020);
- Wintering bird surveys (winter 2019/2020 and winter 2020/2021);
- Breeding bird surveys (April to July 2020) passage bird surveys (April, August and September 2020) and nocturnal long-eared owl survey July 2021);
- Bat surveys, including bat roost surveys and bat activity surveys (May to October 2020) and winter hibernation surveys December 2020 to February 2021);
- Dormouse surveys (April to October 2020);
- Badger survey (May 2020 and October 2020);
- Otter surveys (June and August 2020 across the Kent Project Site, with Botany Marsh West surveyed later in July and September 2020, and updated between March and July 2021);
- Water vole surveys (June, August and September 2020 across the Swanscombe Peninsula, with Botany Marsh West surveyed later in September 2020, and updated between March and July 2021);
- Harvest mouse surveys (October 2020);
- Great crested newt survey (April 2020);
- Reptile surveys (April to September 2020);
- Terrestrial invertebrate surveys, including an invertebrate scoping study (April 2020) and detailed invertebrate sampling (May to August 2020);
- Aquatic invertebrate surveys, including an invertebrate scoping study (April 2020) and detailed invertebrate sampling (May, July and August 2020);
- River corridor survey and river habitat survey (May 2020); and

- Freshwater fish surveys of suitable waterbodies across Swanscombe Marshes (September 2020).

12.22 All surveys have been undertaken with reference to best practice guidance where available. Any limitations in the survey work are detailed in Appendix 12.1 (Document Reference 6.2.12.1) and summarised below under ‘Assumptions and Limitations’.

Assessment Methodology

12.23 The Assessment Methodology adopted by this chapter follows that set out in the EclA Guidelines, as explained in the following sections.

Ecological Zone of Influence or Geographical Scope (Study Area)

12.24 The Ecological Zone of Influence (EZoI) is an area defined by the assessment in which there may be receptors subject to effects as part of the Proposed Development, both those which may occur as a result of land-take and habitat loss and those which may occur through disturbance such as noise. Such receptors are likely to include designated sites, notable habitats and protected species, and these could be affected directly, e.g. construction works affecting a receptor within the Project Site such as removal of a tree occupied by roosting bats, or indirectly, e.g. a designated site located down river of a development being affected by increased storm run-off, etc.

12.25 The EZoI was determined through:

- A review of existing baseline conditions in comparison with that proposed by the Proposed Development;
- Consideration of the proposed activities during construction and operation;
- Desk study information including an examination of mapping data;
- Consultation responses; and
- Findings of the survey work.

12.26 The EZoI is defined as the areas/resources that may be affected by the biophysical changes caused by activities associated with the Proposed Development. The definition of the EZoI used in this assessment is taken from the EclA Guidelines (CIEEM 2018) described above.

12.27 Due to the scale and nature of the proposals, the EZoI includes all land within the DCO Order Limits. In addition, the study area for the desk study extends beyond the DCO Order Limits in order to take account of potential for effects to occur within a wider geographical area.

12.28 The following desk study search radii, taken from the boundary of the DCO Order Limits, were employed and are considered to be sufficient to cover the ecological zone of influence of the Proposed Development:

- International statutory designations (15km);
- National statutory designations (5km);
- Non-statutory locally designated sites (2km);
- Annex II bat species³ records (6km); and
- All other protected/notable species records (2km).

12.29 The field surveys undertaken to inform the assessment cover the Project Site, but are tailored to the individual habitats present on either the Kent Project Site or the Essex Project Site and their suitability to support protected species or species of conservation concern. Further details are provided in Appendix 12.1 (Document Reference 6.2.12.1).

Ecology and Biodiversity Evaluation

12.30 An evaluation of IEFs has been made with reference to the EclA Guidelines. A summary of the evaluation approach is provided below.

12.31 The guidelines advocate an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts, who know the locality of the project and/or the distribution and status of the species or features that are being considered.

12.32 The EclA Guidelines recommend that the value or potential value of an ecological resource or feature should be determined within a defined geographical context, and the EclA Guidelines provide a geographical range ('frame of reference') that can be adapted. The geographical frame of reference used in this assessment is as follows:

- International value (SACs, SPAs, Ramsar sites);
- National value (within England), e.g. Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs);
- Regional value (within south-east England);
- County value (within Kent or Essex), e.g. Local Nature Reserves, Local Wildlife Sites, atypical and diverse species assemblages with good population sizes;

³ Bat species listed in Annex II of the *EC Habitats Directive*, namely Greater horseshoe, Lesser horseshoe, Barbastelle and Bechstein's bats

- District value (within the Borough of Dartford, Borough of Gravesend or Thurrock Council), e.g. where species rich/extensive/atypical examples are present – moderate population sizes or species assemblages with moderate to high diversity;
- Local value (within Swanscombe and Greenhithe Civil Parish, Bean Civil Parish, or Southfleet Civil Parrish, or the towns of Northfleet, Gravesend or Tilbury), e.g. common and widespread species with relatively moderate populations and relatively limited diversity;
- Site value (the Project Site and immediate environs): small areas of common habitats such as species-poor grassland and scrub – common and widespread species with small populations and limited diversity; and
- Negligible value (typically applied to areas of bare open ground/built development/areas of hardstanding).

Designated Sites

12.33 Some sites have already been assigned a level of nature conservation value through designation, and the EclA Guidelines recommend that the reasons for this designation need to be taken into account in the assessment. Such designations include:

- Internationally important sites such as SACs, SPAs and Ramsar sites;
- Nationally important sites such as SSSIs and NNRs;
- Regional/County important sites such as LNRs; and
- County/District important sites such as LWSs.

12.34 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Habitats

12.35 The EclA Guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available. Examples include criteria for Local Wildlife Site selection in Kent⁴ and criteria for Priority Habitats/Habitats of Principal Importance in England, although the value of specific Priority Habitats must then be judged on a case by case basis. Where areas of a habitat or plant community do not meet the necessary criteria for designation at a specific level, the EclA Guidelines recommend that the ecologist may consider the local context if appropriate. It also

⁴ Kent Wildlife Trust (2015) “*Local Wildlife Sites in Kent. Criteria for Selection and Delineation*”. Adopted by the Kent Nature Partnership October 2015, Version 1.5.

emphasises the importance of not under-estimating habitats in sub-optimal condition where there is potential for restoration.

Species

12.36 The guidance deals with species that need to be assessed because they are of biodiversity value, rather than because they are legally protected (although some species may be legally protected as well as being of biodiversity value).

12.37 In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. The valuation of populations should make use of any relevant published evaluation criteria.

Assessment of Potential Impacts

12.38 The EclA Guidelines advocate an approach to assessing likely impacts that involves professional judgement based on available guidance and information.

12.39 The assessment of the potential impacts of the Proposed Development takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features. Impacts can be permanent/temporary, direct or indirect, positive or negative and can include:

- Direct loss of wildlife habitats;
- Fragmentation and isolation of habitats;
- Disturbance to species from noise, light or other visual stimuli;
- Changes to key habitat features; and/or
- Changes to the local hydrology, water quality and/or air quality.

12.40 The significance of a negative effect (or a positive effect) is the product of the magnitude of the impact and the value or sensitivity of the nature conservation features affected. In order to characterise the impacts on each feature, the following parameters are taken into account:

- The magnitude of the impact;
- The spatial extent over which the impact would occur;
- The temporal duration of the impact;
- Whether the impact is reversible and over what timeframe; and

- The timing and frequency of the impact.

Significance of Effects

- 12.41 There is no agreed absolute method for assessing the significance of negative or positive impacts on nature conservation features within the EclA Guidelines. In addition, since the purpose of an EIA is to focus on likely significant effects, it is not reasonable to expect the assessment to include every ecological feature that may be affected, since effects are unlikely to be significant where features of low (Site level or below) value or sensitivity are, for example, subject to low or short-term impacts. On this basis, the assessment therefore focuses on ecological features that are considered, based on professional judgement, experience and contextual information, to be protected and/or of Local nature conservation value or above.
- 12.42 However, this does not mean that effects upon features of less than Local level nature conservation value have been discounted. Certain species and habitats that may not constitute IEFs based upon their nature conservation value, may still warrant consideration during the design of the development (and any mitigation identified) on the basis of their legal protection, their implications for policies and plans, or other issues, such as animal welfare.
- 12.43 The EclA Guidelines also recommend that where ecosystem service provision (benefits that people derive from the natural environment) might be affected as a result of a project's ecological effects, this should be recognised, and the relevant data collected during the EclA to inform separate specialist assessments of social and economic value. This can enable the social and economic implications of ecological changes to be taken into account.
- 12.44 The assessment identifies those positive and negative impacts which would be 'significant', based on effects that either support or undermine the conservation objectives of the ecological feature or biodiversity in general. Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent abundance and distribution)'. Such significant effects are qualified with reference to an appropriate geographic scale and based on the best available scientific evidence. Where it is not possible to robustly justify that no significant effect will occur, a significant effect is assumed.
- 12.45 The integrity of 'designated' sites is described as follows and is taken from the EclA Guidelines. It has been used in this assessment to determine whether the impacts of the Proposed Development on a designated site are likely to be significant:

'Significant effects encompass impacts on structure and function of defined sites and ecosystems. The following need to be determined:

- *for designated sites - is the project and associated activities likely to undermine the site's conservation objectives of the site, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features?'*

12.46 The conservation status of habitats and species within a defined geographical area is described in the EclA Guidelines as follows and has been used in this chapter to determine whether the impacts of the Proposed Development on non-designated habitats and species are likely to be significant:

'Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- *habitats - conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area;*
- *species - conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.'*

12.47 On the basis of the above, and within this assessment, ecological effects are described as either:

- Significant or not significant;
- Direct and/or indirect;
- Permanent or temporary; and
- Negative or positive.

12.48 Mitigation measures have been taken into account during the assessment of effects, such that the residual impact assessment reflects the completed scheme. These measures include those required to achieve the minimum standard of established practice plus additional measures to further reduce the effects of the scheme. The assessment takes into account the likely success of the mitigation.

12.49 The significance of the likely impacts upon IEFs has been assessed both before and after consideration of additional mitigation measures. The latter represents the assessment of the residual impacts of the project.

12.50 In relation to EIA and assessment of significant effects, the EclA Guidelines highlight that:

'A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.'

12.51 In addition to determining the significance of an impact on any ecological features, this chapter also identifies any legal requirements in relation to wildlife.

Temporal Scope

12.52 The assessment of potential ecological effects resulting from the Proposed Development will be undertaken in the context of how the predicted baseline conditions within the EZol might change between the surveys and the start of construction activities. It is anticipated a phased work programme for the Proposed Development will commence in 2022, with Gate One opening in 2024, Gate Two in 2029, with full maturity being achieved by 2038.

Cumulative Effects

12.53 Cumulative effects generally occur where there may be simultaneous or prolonged similar effects on the same habitats or species populations as a result of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified. Where other schemes are relevant, these are considered in conjunction with the Proposed Development.

12.54 Those cumulative impacts that can be foreseen as a result of the Proposed Development in conjunction with the identified schemes, and any possible mitigation measures required, are assessed in 'Cumulative and in-combination assessment' section of this chapter.

Assumptions and Limitations

12.55 The vast majority of surveys have been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. Limitations specific to each of the field survey methodologies are detailed within the appropriate sections of Appendix 12.1 (Document Reference 6.2.12.1) and are summarised below.

Access to Botany Marsh West

12.56 Whilst landowner permission was granted in spring 2020 to undertake environmental DNA (eDNA) testing for the presence of great crested newts (*Triturus cristatus*), permission to access 'Botany Marsh West' for other surveys was not granted until mid-July 2020. Therefore, no additional survey work was undertaken within the interior of the fields here prior to this, including habitat surveys or wintering bird surveys, breeding bird surveys, and bat surveys. There is some possibility therefore that some species occupying the interior of the fields, such as snipe or skylark, may have gone unrecorded but these species were recorded elsewhere on the Kent Project Site by EDP in 2020 and therefore assumed potentially present in Botany Marsh West. Furthermore, prior to July 2020 surveys were

conducted on similar habitat close to, or adjacent to, the marsh and so it is reasonably assumed that any species confirmed present in suitable, connected habitat near to/adjacent to the marsh are also present in these areas. Following receipt of permission for ecology surveys, the following surveys were completed: Extended Phase 1 Habitat Survey and botanical survey (July 2020), terrestrial and aquatic invertebrate sampling (July and August 2020), water vole surveys (1 visit July 2020, and 1 visit September 2020), harvest mouse survey (October 2020), and fish survey of the ditch network (end-September 2020).

Access to Waterbodies

- 12.57 During the course of the eDNA surveys to confirm the presence/absence of great crested newts, access was not possible to every single one of the ponds and ditches on or adjacent to the Project Site. However, a large number of waterbodies within the Kent Project Site were surveyed and all eDNA analysis returned a negative result (i.e. no evidence of the presence of great crested newt DNA), and there were no recent records returned during the desk study. On this basis, it is considered a fair assumption that great crested newts are unlikely to be present on the Kent Project Site. Furthermore, due to the lack of suitable habitat, great crested newts are considered highly unlikely to be present on the Essex Project Site.
- 12.58 The lack of access to some water bodies also posed a limitation to the otter and water vole survey. However, presence of water vole within the Kent Project Site was confirmed during the first survey in June 2020, and it is assumed that water vole could utilise other parts of the ditch network due to the presence of suitable habitat. On a precautionary basis therefore, the assessment assumes that water vole could be present in the other suitable water bodies on the Kent Project Site. Similarly, with regard to the presence of otter, an otter was sighted within Black Duck Marsh in March 2020, and it is assumed that otters may be present in other parts of the Kent Project Site such as along the River Ebbsfleet and the ditch network due to the presence of suitable habitat.
- 12.59 The lack of access to some water bodies posed a limitation to freshwater fish surveys undertaken across Swanscombe marshes, whilst high alkalinity levels in some waterbodies reduced the effectiveness of electrofishing operation. However, it is considered that the results of surveys undertaken can be applied to those waterbodies to which access was not possible, given the relative uniformity of habitat conditions, topography and flow. The findings of the survey are, furthermore, consistent with previous survey effort undertaken during 2015 and a habitat suitability assessment, in respect of fish.

Access to Buildings/Structures

- 12.60 The bat roost assessment of buildings identified 166 buildings within the Order Limits, of which 117 were assessed as having negligible potential to support roosting bats, with 23 buildings found to have some potential, and 26 buildings (16% of the total) which could not be adequately assessed due to access restrictions including permission not been granted by the landowner or buildings being inaccessible due to dense scrub. In light of

the 'lockdown' and social distancing measures imposed as a result of the COVID-19 virus global pandemic, internal access to buildings has not been possible for all buildings. For these 26 buildings where this is a lack of information, a precautionary approach to the assessment of potential effects has been followed in this chapter, with precautionary mitigation measures detailed within the 'Bat Mitigation Strategy' enclosed within the EMMF (Document reference: 6.2.12.3), as advised by Natural England in their Discretionary Advice Service letter of 9th October 2020 (copy of which is enclosed as Annex EDP 13 to the EMMF (Document reference: 6.2.12.3)).

12.61 Tunnels TU/014A and TU/015 within Craylands Pit (see Appendix 12.1; Document Reference 6.2.12.1) were not surveyed beyond their initial inspection due to health and safety constraints relating to access and night-time surveys. As such no summer roosting or autumn swarming bat surveys have been undertaken on these tunnels. In addition, there was no access for an autumn swarming survey on tunnel TU/012 in August due to positioning of the boarding across the entrance, this was later moved to allow access for the microphone. Given access constraints to the tunnels it was not always possible to position static detectors during the autumn swarming and winter hibernation surveys to ensure only bats from within the tunnel are recorded. As such a number of recordings may be made from foraging bats outside the tunnel entrances. This has been taken into account during the interpretation of survey findings.

Access to Bamber Pit

12.62 Due to access and security issues, bat transects and static detector deployment could not take place in Bamber Pit in July and August 2020. However, the remainder of the Kent Project Site was surveyed, including areas close to Bamber Pit, and Bamber Pit was surveyed in May, June and September 2020. It is considered unlikely that the overall value of the bat assemblage has been underestimated as a result of missing the July and August 2020 survey.

12.63 Due to access and security issues, the reptile refugia within Bamber Pit were not checked after the second survey visit in May 2020, until these issues were resolved in September 2020, with the remaining visits then completed in September 2020. A total of seven survey visits were able to be conducted. Reptile surveys were therefore completed within the recognised survey period of April to September, and reptiles were found during the visits, thus confirming presence within these areas of the Kent Project Site. The reptile refugia within and around Botany Marsh were all checked in September 2020, which is considered an optimal month for recording reptiles.

Damage to Reptile Refugia

12.64 Following the first reptile survey in May 2020, some of the artificial refugia in the north of the Kent Project Site were moved and damaged due to mowing activity. However, reptiles were still recorded in this area, and replacement refugia were deployed in June 2020 and remained in place for the following checks, allowing for an accurate presence/absence survey and population estimate.

General Limitations

- 12.65 Owing to the seasonality of some species, as well as the ability for some species to quickly colonise sites (such as badger), the absence of evidence of any particular species from within the Project Site should not be taken as conclusive evidence that the species is not present or that it will not be present in the future.
- 12.66 Overall, it is considered that the results of the Phase 1 survey and additional Phase 2 surveys undertaken in 2019 and 2020 are robust and reliable for the identification of the habitats and the presence or absence of legally protected/notable species within the Project Site, and sufficient to identify the IEFs requiring further consideration in the EclA.
- 12.67 The scope of surveys undertaken at the Essex Project Site is considered a robust level of survey effort based on the nature of the habitats present, being largely developed land of negligible intrinsic ecological value. The surveys undertaken at the Essex Project Site are not considered to pose a limitation to the robustness of the EclA.

RELEVANT LAW, POLICY AND GUIDANCE

Legislative and Policy Context

- 12.68 There are a number of different legislative instruments that are relevant to the assessment of potential effects of the construction and operation of the London Resort. The key international legislation that has been considered is set out within **Table 12.3**.

Table 12.3: A Summary of Legislation and Conventions of Relevance to the Proposed Development.

Title	Summary and Relevance
International	
Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) (the 'Habitats Directive')	Provides a framework for the conservation and management of natural habitats, wild fauna (except birds) and flora in Europe. Its aim is to maintain or restore natural habitats and wild species at a favourable conservation status. The relevant provisions of the Directive are the identification and classification of Special Areas of Conservation (SACs) (Article 4) and procedures for the protection of SACs (Article 6). SACs are identified based on the presence of natural habitat types listed in Annex I and populations of the species listed in Annex II. The Directive requires national Governments to establish SACs, and to have in place mechanisms to protect and manage them. SACs are also termed Natura 2000 sites, and those that are covered by tidal water (continuously or intermittently) are also termed 'European Marine Site' (EMS) - although this is not a statutory site designation.

Title	Summary and Relevance
<p>Birds Directive - Council Directive 2009/147/EC on the Conservation of Wild Birds</p>	<p>This Directive provides a framework for the conservation and management of wild birds in Europe. The most relevant provisions of the Directive are the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive and for all regularly occurring migratory species (required by Article 4). It also establishes a general scheme of protection for all wild birds (required by Article 5). The Directive requires national Governments to establish SPAs and to have in place mechanisms to protect and manage them. The SPA protection procedures originally set out in Article 4 of the Birds Directive have been replaced by the Article 6 provisions of the Habitats Directive.</p>
<p>Ramsar Convention on Wetlands of International Importance (1972)</p>	<p>In accordance with Government advice in both England and Wales, Ramsar sites (internationally important wetlands) must be given the same consideration as European sites, so they are afforded the same protection as those under the Habitats Directive - Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.</p>
<p>Water Framework Directive (WFD) (2000/60/EC)</p>	<p>The WFD establishes a framework for the management and protection of Europe’s water resources. It is implemented in England and Wales through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the Water Framework Regulations). Central to the WFD is the philosophy to make water bodies better through sustainable development for the joint benefits of aquatic habitats and the human environment.</p> <p>Ecological status is an expression of the quality of the structure and functioning of surface water ecosystems as indicated by the condition of a number of ‘quality elements’. These include biological, hydro-morphological and chemical indicators. The development and implementation of strategic long-term River Basin Management Plans (RBMPs) is a key requirement of the WFD. They include a programme of measures outlining the on-going monitoring and management actions required for water bodies to achieve future objectives.</p> <p>Proposed developments or activities that have the potential to affect the water environment require a WFD Assessment. In this context, compliance with the WFD means prevention of deterioration (of ecological status, chemical status and supporting element status) and prevention of ability to achieve future targets. However, WFD Article 4.7 provides legislation for exemption conditions that could allow implementation of schemes that cause deterioration in ecological status, for example for reasons of overriding public interest.</p>

Title	Summary and Relevance
EU Alien Invasive Species Regulation (Regulation No 1143/2014)	Regulation (EU) 1143/2014 on invasive alien species (the IAS Regulation) entered into force on 1 January 2015, fulfilling Action 16 of Target 5 of the EU 2020 Biodiversity Strategy. The regulation is designed to establish a framework for action to prevent, minimise and mitigate the adverse impacts of invasive non-native species on biodiversity and ecosystem services, and focuses on a list of invasive alien species of EU concern, which has been drawn up with Member States using risk assessments and scientific evidence. Selected species are banned from the EU, meaning it will not be possible to import, buy, use, release or sell them. The proposal is for three types of intervention: prevention; early warning and rapid response; and management.
Convention on the Conservation of European Wildlife and Natural Habitats (the 'Berne Convention')	This Convention was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase co-operation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species).
Convention on the Conservation of Migratory Species of Wild Animals (the 'Bonn Convention')	This Convention was adopted in Bonn, Germany in 1979 and came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral agreements for the conservation and management of migratory species which require or would benefit from international co-operation (listed in Appendix 2 of the Convention), and by undertaking co-operative research activities.
Convention on Biological Diversity 1992	The Convention focuses on the conservation of all species and ecosystems and, therefore, provides protection to all biodiversity. The Convention requires the development of national strategies, plans or programmes for the conservation and sustainable use of biodiversity, its sustainable use, and equitable sharing of benefits arising from the utilisation of natural resources (i.e. the Ecosystem Approach). In accordance with this, the UK developed Biodiversity Action Plans (BAPs).
National	
The Conservation of Habitats and Species Regulations (2017)	The Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales, and make provision for the protection and management of sites, including the control of potentially damaging operations that may affect designated sites. The Regulations came into force on 30 November 2017.

Title	Summary and Relevance
Wildlife and Countryside Act 1981	This Act is the principal mechanism for the legislative protection of wildlife in Britain. It consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the conservation of wild birds (Birds Directive) in Great Britain. The Act provides for the designation of Sites of Special Scientific Interest (SSSIs), which are selected as the best national examples of habitat types, sites with notable species and sites of geological importance. Various species of marine animals are also protected from being killed, injured or disturbed under provisions in Schedule 5 of the WCA 1981. It is also the principal UK legislation dealing with non-native species.
National Environment and Rural Communities (NERC) Act 2006	The NERC Act 2006 makes provision for bodies concerned with the natural environment and rural communities, amends protection for some designated wildlife areas, and amends the law relating to rights of way. Section 41 of the Act required the Secretary of State to publish a list of habitats and species of principal importance for the conservation of biodiversity in England. This list (the S41 list) includes habitats and species which have been identified as requiring action in the UK Biodiversity Action Plan (UK BAP), in line with the 1992 Convention on Biological Diversity.
The Protection of Badgers Act 1992	Legislation primarily aimed at preventing cruel treatment and persecution of badgers. Makes it an offence to kill, injure or take a badger and intentionally or recklessly damage or destroy a badger sett, or obstruct access to it.
The Water Resources Act 1991 (WRA)	The WRA regulates water resources, water quality, pollution and flood defence. The policing of this act is the responsibility of the Environment Agency; under the act is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any controlled water.
Salmon and Freshwater Fisheries Act 1975 (as amended)	Makes it an offence to discharge effluents which may damage fish, their food or their spawning grounds.
Water Act 2014	Part 3 of the Water Act 2014 focusses on the Environmental Permitting regime in relation to water abstraction and pollution prevention and control (enabling single rather than multiple permit applications).
The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015	Key transposing Directions that set out the environmental standards to be used for the second cycle of river basin plans.

Policy

12.69 There are a number of national and local policies that are of relevance to the London Resort ecological assessment process (summarised in **Table 12.4**).

Table 12.4: Summary of national and local policies of relevance to the London Resort.

Title	Summary and Relevance
National	
National Policy Statement (NSP) for National Networks (2014)	<p>Whilst there is no NPS for business and commercial NSIP project, the extent that the Proposed Development includes transport and highways infrastructure means that regard will be had to the NPS on National Networks, including:</p> <ul style="list-style-type: none"> • Environmental and Social impacts (NPS paragraphs 3.2 to 3.5); • Climate Change Adaptation (NPS paragraphs 4.36 to 4.47); • Pollution Control and Other Environmental Protection Regimes (NPS paragraphs 4.48 to 4.56); • Biodiversity and ecological conservation (NPS paragraphs 5.20 to 5.38); • Flood Risk and Mitigation (NPS paragraphs 5.90 to 5.115); and • Water Quality and Resources (NPS paragraphs 5.219 to 5.231).
National Planning Policy Framework, 2021	<p>The latest National Planning Policy Framework (NPPF) was published in July 2021. The NPPF is a material consideration that must be taken into account in the determination of planning applications. The NPPF requires that an overall approach is taken to sustainable development, incorporating social, economic and environmental dimensions which should not be considered in isolation. A section of the NPPF document addresses ‘Conserving and enhancing the natural environment’. Amongst other objectives this section indicates when determining planning applications, that local planning authorities should aim to contribute to and enhance the natural and local environment by applying a number of outlined principles. Planning Practice Guidance on the natural environment supports the NPPF by explaining the government’s planning policies for England, in regard to (amongst others) the protection and enhancement of biodiversity, ecosystem and green infrastructure, and how these are expected to be applied.</p>

Title	Summary and Relevance
National	
UK Post-2010 Biodiversity Framework	The UK Post-2010 Biodiversity Framework has succeeded the UK Biodiversity Action Plan (UK BAP). The Framework demonstrates how the work of the four countries and the UK contributes to achieving the Aichi Biodiversity Targets, and identifies the activities required to complement the country biodiversity strategies in achieving the targets. Although the UK BAP has been superseded, the list of UK BAP priority habitats and species remains a useful reference for local authority decision-makers and forms the basis of the Section 41 list of the NERC Act.
Local	
Thurrock Council Local Plan	<p>The Thurrock Borough Local Plan 1997 sets out the Council's policies and proposals for the way in which land, buildings and infrastructure should be developed. By law, although the end date of the Borough Local Plan has passed, its policies are a material consideration when deciding planning applications. The Council are in the process of developing a new Local Plan for Thurrock, however, this is in the early stages of development and is not anticipated to be adopted until 2021. The development plan for Thurrock comprises the following documents: Thurrock Core Strategy and Policies for Management of Development and Policies Map, as amended, adopted January 2015 and Thurrock Borough Local Plan Saved Policies, Site Allocations and Annexes, February 2012.</p> <p>Policies relevant to this chapter include:</p> <ul style="list-style-type: none"> • Policy CSTP18: Green Infrastructure; and • Policy CSTP19: Biodiversity.
Dartford Borough Local Plan	<p>The Dartford Borough Local Plan 2011 sets out the Council's policies and proposals for the way in which land, buildings and infrastructure should be developed.</p> <p>The development plan for Dartford comprises the following documents: Dartford Core Strategy, adopted September 2011 and Dartford Development Policies Plan, adopted July 2017.</p> <p>Policies relevant to this chapter include:</p> <ul style="list-style-type: none"> • Policy CS14: Green Space.
Gravesham Borough Local Plan	The Gravesham Borough Local plan 2014 Plan sets out the Council's policies and proposals for the way in which land, buildings and infrastructure should be developed.

Title	Summary and Relevance
National	
	<p>The development plan for Gravesham comprises the following documents: Gravesham Local Plan Core Strategy and Local Plan Policies Map, adopted September 2014 and Local Plan Review, undertaken in September 2019.</p> <p>Policies relevant to this chapter include:</p> <ul style="list-style-type: none"> • Policy CS12: Green Infrastructure. <p>Following the Regulation 18 (Stage 1) Consultation of the Gravesham Borough Council emerging Local Plan, the Council are undertaking a Regulation 18 (Stage 2) consultation to seek views on the updated policies in the Development Management Policies Document. Proposed 'draft' policies relevant to this chapter include:</p> <ul style="list-style-type: none"> • Policy GI 6: Biodiversity.

Guidance

12.70 The key guidance document used to inform this assessment is the EclA Guidelines (CIEEM 2018) described above. Other relevant guidance can be found in **Table 12.5** below.

Table 12.5: A Summary of Guidance followed for the Proposed Development.

Title	Summary and Relevance
National	
Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (PINS, 2020)	This Advice Note explains the Environmental Impact Assessment (EIA) process set out in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations). In particular the note addresses the procedures for EIA screening and scoping; notification and consultation; matters relating to the production of Preliminary Environmental Information (PEI) and the preparation of Environmental Statements (ES).
Advice Note 9: Rochdale Envelope (PINS, 2018)	This Advice Note addresses the use of the 'Rochdale Envelope' approach under the Planning Act 2008, as amended (PA2008).

Title	Summary and Relevance
Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects (PINS, 2017)	When preparing applications for NSIPs under the PA2008, Applicants should consider the potential effects of the application on protected habitats. If an NSIP, when taken alone or with existing and known future projects, is likely to affect a European site and/or a European Marine site, the Applicant must provide a report with the application showing the site(s) that may be affected together with sufficient information to enable the competent authority to make an Appropriate Assessment, if required. This Advice Note provides advice for Applicants in relation to the preparation of that report, and the PA2008 processes relating to HRA.
Advice Note 12: Transboundary Impacts and Process (PINS, 2018)	This Advice Note explains the legal context for transboundary impacts, and the NSIP transboundary process (including special arrangements) that will be followed by the Inspectorate on behalf of the Secretary of State during the pre-application, examination and recommendations stages of a DCO application. The Advice Note also explains how Applicants, States and the public can participate more generally in the DCO process where transboundary impacts occur.
Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (PINS, 2019)	A range of public sector and industry-led guidance is available on Cumulative Effects Assessment (CEA) but at present there is no single, agreed industry standard method. Consequently, the approach to CEA varies between applications. This Advice Note sets out a staged process that Applicants for the London Resort DCO are adopting in CEA for NSIPs.
Advice Note 18: The Water Framework Directive (PINS, 2017)	The purpose of this Advice Note is to alert Applicants to the requirements of the WFD and 2017 Regulations, as applicable to NSIPs under the PA2008. This Advice Note explains the information that the Inspectorate considers an Applicant must provide with their NSIP application in order to clearly demonstrate that the WFD and the 2017 Regulations have been appropriately considered.
The Design Manual for Roads and Bridges (DMRB) Volume 11: Environmental Assessment (and updates) (Highways Agency <i>et al.</i> 2008)	This Advice Note provides guidance for determining the significance of environmental effects, including for cumulative effects, and for the management of those effects.
British Standards Institute (2013) BS 42020 – Biodiversity – Code of Practice for Planning and Development	Provides recommendations and guidance to ecological consultants, planning applicants and planning authority decision makers, to ensure that ecological considerations are given the appropriate weight at each stage of the planning process, and are sufficiently informed by scientific assessment.

Title	Summary and Relevance
The IUCN Red list	The International Union for Conservation of Nature (IUCN) has compiled a Red list of threatened species that are facing a high risk of global extinction.
Guidance for survey methodologies	A range of guidance documentation was referred to for the design and completion of project-specific surveys. Relevant guidance is referred to in the survey reports.

BASELINE CONDITIONS

12.71 This section summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations described above. In particular, this section identifies and evaluates those ecological features/receptors that lie within the Project Site's potential zone of influence and are pertinent in the context of the Proposed Development.

12.72 Full results of the desk-based searches and field surveys undertaken, along with their findings, are provided within Appendix 12.1 (Document Reference 6.2.12.1). The findings are summarised below along with a final list of 'Important Ecological Features' to be considered within the EclA. References to parts of the Project Site use commonly used names as shown on Figure 12.1 (Document Reference 6.2.12.1).

Statutory Designations

12.73 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or National level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

12.74 Statutory designations occurring within the potential zone of influence of the Project Site are detailed below and illustrated in Figure 12.2 (Document Reference 6.2.12.2).

International Designations (SPAs/SACs/Ramsar)

12.75 No part of the Project Site is covered by any international statutory designations. However, there are four statutory designations of international importance within 15km of the Project Site as described below. Reasons for their designation are provided in full within Appendix 12.1 (Document Reference 6.2.12.1).

Thames Estuary and Marshes SPA/Ramsar

12.76 The Thames Estuary and Marshes SPA is located c.3.3km east of the Essex Project Site, and c.6.0km east of the Kent Project Site. The corresponding Thames Estuary and Marshes

Ramsar site is located 2.8km east of the Essex Project Site and 4.8km from the Kent Project Site. It comprises extensive intertidal mudflats that are visible at low tide. Additionally, there is saltmarsh and complex channel systems.

- 12.77 The Thames Estuary and Marshes SPA qualifies under Article 4.1 of the EU Birds Directive (Council Directive 79/409/EEC) as it supports populations of European importance over winter of the regularly occurring Annex 1 species avocet (*Recurvirostra avosetta*) and hen harrier (*Circus cyaneus*). This Site also qualifies as an SPA under Article 4.2 of the EU Birds Directive as it supports populations of European importance of regularly occurring migratory species including ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), dunlin (*Calidris alpina alpina*), knot (*Calidris canutus*), black-tailed godwit (*Limosa limosa islandica*) and common redshank (*Tringa totanus*). This SPA site also supports an internationally important assemblage of waterfowl as stated in Article 4.2 of the Directive, which includes gadwall (*Anas strepera*), shoveler (*Anas clypeata*), tufted duck (*Aythya fuligula*), and pochard (*Aythya ferina*).
- 12.78 The Thames Estuary and Marshes Ramsar site qualifies under Ramsar Criterion 2 as it supports more than 20 British Red Data Book invertebrates and populations of the GB Red Book endangered least lettuce (*Lactuca saligna*), as well as the vulnerable slender hare's-ear (*Bupleurum tenuissimum*), divided sedge (*Carex divisa*), sea barley (*Hordeum marinum*), Borrer's saltmarsh-grass (*Puccinellia fasciculata*), and dwarf eelgrass (*Zostera noltei*). It also qualifies under Criterion 5 for its internationally important assemblage of waterfowl, and Criterion 6 for its internationally important numbers of over-wintering waterfowl.

Medway Estuary and Marshes SPA/Ramsar

- 12.79 The Medway Estuary and Marshes SPA/Ramsar is located c.13.1km south-east of the Essex Project Site, and c.16.4km east of the Kent Project Site.
- 12.80 The Medway Estuary and Marshes SPA qualifies under Article 4.1 of the EU Birds Directive (79/409/EEC) by supporting populations of European importance over winter of avocet and bewick's swan (*Cygnus columbianus bewickii*). It also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following species over winter: black-tailed godwit, redshank, curlew (*Numenius arquata*), dark-bellied brent goose (*Branta bernicla bernicla*), dunlin, greenshank (*Tringa nebularia*), grey plover, knot, oystercatcher (*Haematopus ostralegus*), pintail (*Anas acuta*), ringed plover, shelduck (*Tadorna tadorna*), shoveler, teal (*Anas crecca*), turnstone (*Arenaria interpres*), and wigeon (*Anas penelope*). This SPA site also supports an internationally important assemblage of waterfowl as stated in Article 4.2 of the Directive, which includes red-throated diver (*Gavia stellata*), great crested grebe (*Podiceps cristatus*), cormorant (*Phalacrocorax carbo*), Bewick's swan, dark-bellied brent goose, shelduck, wigeon, teal, mallard (*Anas platyrhynchos*), pintail, shoveler, pochard, oystercatcher, avocet, ringed plover, grey plover, lapwing (*Vanellus vanellus*), knot, dunlin, black-tailed godwit, curlew, redshank, greenshank and turnstone.

12.81 The Medway Estuary and Marshes Ramsar is designated under Ramsar Criterion 2 as it supports a number of species of rare plants and animals including several nationally scarce plants, and a total of at least twelve British Red Data Book species of wetland invertebrates. It also qualifies under Criterion 5 (formerly 3a) as it supports an international important waterfowl assemblage (greater than 20,000 birds), and it qualifies under Criterion 6 (formerly 3c), over winter, the site regularly supports internationally important populations of dark-bellied brent goose, dunlin, grey plover, knot, pintail, redshank, ringed plover and shelduck.

North Downs Woodland SAC

12.82 The North Downs Woodland SAC is located c.9.7km south-east of the Essex Project Site, and 8km south-east of the Kent Project Site. It is designated based on the following qualifying features:

- Annex I habitats that are a primary reason for selection:
 - 9130 Asperulo-Fagetum beech forests; and
 - 91J0 *Taxus baccata* woods of the British Isles * Priority feature.

Peters Pit SAC

12.83 Peters Pit SAC is located 13.8km south-east of the Essex Project Site, and 12.8km south-east of the Kent Project Site. It is designated for the following qualifying features:

- Annex II species that are a primary reason for selection of this site:
 - Great crested newt for which this is considered to be one of the best areas in the United Kingdom.

12.84 Both Thames Estuary and Marshes SPA/Ramsar and Medway Estuary and Marshes SPA/Ramsar support migratory birds and bird populations that have potential to use areas of ‘functionally linked’ land⁵ near the designations. Two distinct areas within the Kent Project Site that appear to be functionally linked directly to the estuary assemblage, and therefore potentially to nearby Ramsar/SPA/SSSI designations, are Botany Marsh West and Black Duck Marsh, which are locally important areas at dawn (rest)/high tide (refuge) for small numbers of several target species.

12.85 Therefore, both sites are at potential risk of adverse effects as a result of loss/damage/disturbance of functionally linked land within Botany Marsh and Black Duck Marsh and the Proposed Development. Both designations will therefore be considered

⁵ ‘Functionally linked land’ refers to land (or sea) beyond the boundary of a European site which might provide a (potentially important) role in maintaining or restoring a protected population at favourable conservation status through the role or function the land (or sea) provides, e.g. providing habitat for refuge, rest or foraging

Important Ecological Features scoped into the EclA and are further considered within the Shadow Habitat Regulations Assessment (HRA) submitted along with the DCO application (see Appendix 12.4; Document Reference 6.2.12.4).

- 12.86 In relation to the North Downs Woodland SAC, there is potential for traffic generated air quality impacts as a result of the Proposed Development both alone and in-combination with other developments, as identified in Natural England’s consultation response to the EIA Scoping (see Appendix 12.5; Document Reference 6.2.12.5) and PEIR (see Appendix 12.6; Document Reference 6.2.12.6). The SAC is therefore considered further as an IEF within the EclA, and potential effects are ‘screened’ within the HRA (Document Reference 6.2.12.4).
- 12.87 Peters Pit SAC is located 13.8km away from the Proposed Development and it is considered highly unlikely that the Proposed Development will have any adverse effects on this designation, which is subsequently scoped out of the EclA and not considered further. Within their consultation response to the EIA Scoping and PEIR, Natural England have not raised any objection to the scoping out of this designation.
- 12.88 Furthermore, it should be acknowledged that the scope of the HRA for the Tilbury2 development was limited to the Thames Estuary and Marshes SPA/Ramsar stating that:

‘All other European nature conservation designations are located at least 9km from the Site, at which distance they are considered to be beyond the range of potential significant effects. No other designations have emerged through the scoping process, and therefore no other European nature conservation designations are given any further consideration...’

National Designations (SSSIs and NNRs)

- 12.89 In total, 11 SSSIs have been identified as being IEFs at risk of adverse effects from the Proposed Development. This includes the Swanscombe Peninsula SSSI, which occupies the majority of the Kent Project Site, and includes the former Bakers Hole SSSI, and a number of SSSIs within the EZoI of the Proposed Development as described further below.

Swanscombe Peninsula SSSI

- 12.90 Swanscombe Peninsula SSSI was notified by Natural England on 11 March 2021.
- 12.91 The Swanscombe Peninsula SSSI notification document⁶ describes the site as “*a complex of open mosaic habitats on previously developed land and traditional estuarine habitats located near and within the River Thames, Kent. Habitats include chalk pits, free-draining grassland, scrub, wetlands, grazing marsh, mudflats and saltmarsh.*”

⁶ ‘Swanscombe Peninsula SSSI Kent – Notification under Section 28C of the Wildlife and Countryside Act 1981.’ Natural England, published 11 March 2021.

- 12.92 The SSSI boundary includes within it an existing SSSI (Bakers Hole, notified in 1989), and an enlarged SSSI area to take account of the biological interest on the peninsula. The total SSSI boundary equates to an area of 264.10ha.
- 12.93 Bakers Hole SSSI was originally designated for its geological/palaeontological interest and no additional reasons have been put forward for its designation. Bakers Hole SSSI now forms part of the Swanscombe Peninsula SSSI, however, impacts upon the SSSI from a geological perspective are addressed within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
- 12.94 The enlarged SSSI area, to be named Swanscombe Peninsula SSSI, covers the majority of the Kent Project Site and has been notified for the following biological interest:
- Vascular plants – populations of the following plants: divided sedge (*Carex divisa*), yellow vetchling (*Lathyrus aphaca*), slender hare's-ear (*Bupleurum tenuissimum*), Bithynian vetch (*Vicia bithynica*) and round-leaved wintergreen (*Pyrola rotundifolia* subsp. *maritima*);
 - Invertebrates – assemblages of invertebrates associated with bare sand and chalk, open short swards, open water on disturbed mineral sediments and saltmarsh and transitional brackish marsh; and
 - Breeding birds – two diverse assemblages of breeding birds: one associated with lowland open waters and their margins, lowland fen and lowland damp grassland; and the other with lowland scrub.

Other SSSIs within theoretical EZol

- 12.95 In addition to the above, there are also a number of other SSSIs within the theoretical 5km EZol, however, some of the SSSIs within this zone have been excluded from the EclA based on their reasons for designation and/or lack of effect-receptor pathways. Several SSSIs located beyond the 5km EZol have been included in the EclA owing to their location within one of the higher order IEFs identified above (i.e. SAC, SPA, Ramsar Site) and/or due to effect-receptor pathways having been identified over greater distances. This is summarised in **Table 12.6** below.

Table 12.6: Consideration of SSSIs for inclusion in the EclA.

SSSI	Approximate Distance and Direction from the Project Sites*	Include in or exclude from EclA?	Reasoning
Swanscombe Peninsula SSSI	Covers the majority of the	Include	Located within KPS with direct impacts upon biological features

SSSI	Approximate Distance and Direction from the Project Sites*	Include in or exclude from EclA?	Reasoning
	KPS, and 3km W of ExPS.		identified. Impacts upon the SSSI from a geological perspective are addressed within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
Darenth Woods SSSI	Adjacent to the south-west corner of the KPS and 6.2km south-west of the ExPS.	Include	Within theoretical EZol and effect-receptor pathways identified.
Swanscombe Skull Site SSSI and NNR	0.5km south of KPS and 4.2km south-west of ExPS.	Exclude	SSSI designated for its geological rather than ecological importance and will be addressed if appropriate within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
West Thurrock Lagoon and Marshes SSSI	450m west of KPS and 4.1km west of the ExPS.	Include	Within theoretical EZol and effect-receptor pathways identified.
Lion Pit SSSI	1.4km north of KPS and 3.4km west of the ExPS.	Exclude	SSSI designated for its geological rather than ecological importance and will be addressed if appropriate within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
Grays Thurrock Chalk Pit SSSI	1.9km north of KPS and 2.5km north of the ExPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Hangmans Wood and Denholes SSSI	1.9km north of ExPS and 3.3km north-east of the KPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.

SSSI	Approximate Distance and Direction from the Project Sites*	Include in or exclude from EclA?	Reasoning
Globe Pit SSSI	2.2km north-east of KPS and 1.1km north of ExPS.	Exclude	SSSI designated for its geological rather than ecological importance and will be addressed if appropriate within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
South Thames Estuary and Marshes SSSI	2.5km east of ExPS and 4.7km east of the KPS.	Include	Within theoretical EZoI, effect-receptor pathways identified and included by virtue of its location within the higher order IEF (Thames Estuary and Marshes SPA).
Purfleet Chalk Pits SSSI	3.6km north-west of KPS and 6.1km west of the ExPS.	Exclude	SSSI designated for its geological rather than ecological importance and will be addressed if appropriate within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
Mucking Flats and Marshes SSSI	4.1km east of ExPS and 7.5km east of the KPS.	Include	Within theoretical EZoI, effect-receptor pathways identified and included by virtue of its location within the higher order IEF (Thames Estuary and Marshes SPA).
Shorne and Ashenbank Woods SSSI	4.8km south-east of both Project Sites.	Include	On outer limit of theoretical EZoI but effect-receptor pathways identified.
Inner Thames Marshes SSSI	5.5km north-west of KPS and 8.3km north-west of the ExPS.	Include	Outside of theoretical EZoI but effect-receptor pathways identified.
Cobham Woods SSSI	6.7km south-east of the KPS and 7.5km south-east of the ExPS.	Include	Outside of theoretical EZoI but effect-receptor pathways identified.

SSSI	Approximate Distance and Direction from the Project Sites*	Include in or exclude from EclA?	Reasoning
Great Crabbles Wood SSSI	7.5km south-east of the KPS and 6.9km south-east of the ExPS.	Include	Outside of theoretical EZoI but effect-receptor pathways identified.
Wouldham to Detling Escarpment SSSI	13.0km south-east of the ExPS, and 12.4km SE of KPS.	Include	Outside of theoretical EZoI but effect-receptor pathways identified by virtue of its location within the higher order IEF (North Downs Woodland SAC).
Medway Estuary and Marshes SSSI	13.0km south-east of the ExPS and 14.7km east of the KPS.	Include	Outside of theoretical EZoI but effect-receptor pathways identified by virtue of its location within the higher order IEF (Medway Estuary and Marshes SPA).

*KPS = Kent Project Site; ExPS = Essex Project Site

Non-statutory Designations

12.96 Non-statutory designations are also commonly referred to in planning policies as 'local sites', although in fact these designations are typically considered to be important at a county level. In Kent and Essex, such designations are referred to as Local Wildlife Sites (LWSs). Additional non-statutory designations which should be considered in the assessment include Local Nature Reserves (LNRs) and Ancient Semi-natural Woodland (ASNW) where these are not covered by other designations.

12.97 In total, five LWSs have been identified as being IEFs at risk of adverse effects from the Proposed Development. These include two LWSs within the Kent Project Site and a further three LWSs within the theoretical 2km EZoI, however a large proportion of the LWSs within this zone (as shown on Figure 12.3; Document Reference 6.3.12.3) have been excluded from the EclA based on their reasons for designation, spatial separation and/or lack of effect-receptor pathways. This is summarised in **Table 12.7** below.

Table 12.7: Consideration of LWSs for inclusion in the EclA.

LWS	Approximate Distance and Direction from the Project Sites*	Include in or exclude from EclA?	Reasoning
GR19. Botany Marshes	Within the KPS and 2.2km west of the ExPS.	Include	Within the Project Site with potential for direct effects.
GR05. Ebbsfleet Marshes, Northfleet	Partly within the KPS and 2.2km south-east of the ExPS.	Include	Within theoretical EZoI with potential for direct effects.
DA13. Alkerden Lane Pit	28m south of the KPS and 3.7km west of the ExPS.	Include	Within theoretical EZoI and effect-receptor pathways identified.
DA1. Bluewater Quarry	Adjacent to the western edge of KPS and 6.1km west of the ExPS.	Exclude	LWS designated for its geological rather than ecological importance and will be addressed if appropriate within Chapter 14: Cultural Heritage and Archaeology (Document reference: 6.1.14).
DA12. Disused Hospital Grounds, Mabledon	1.3km south-west of KPS and 7.7km south-west of ExPS.	Include	Within theoretical EZoI with potential for indirect effects due to changes in air quality.
DA01. Green Street Common	1.6km south-west of KPS and 6.9km south-west of the ExPS.	Exclude	Within theoretical EZoI but no effect-receptor pathways identified
Th37. Tilbury Marshes	25m to the east of the ExPS and 3.3km east of the KPS.	Include	Within theoretical EZoI and effect-receptor pathways identified.
Th39. Lytag Brownfield	732m north-east of ExPS and 4.2km east of the KPS.	Exclude	Within theoretical EZoI but no effect-receptor pathways identified.
Th40. Tilbury Centre	900m east of ExPS and 4.3km east of the KPS.	Exclude	Within theoretical EZoI but no effect-receptor pathways identified.
Th15. West Thurrock Reedbed	1.8km north-west of KPS and 4.8km west of the ExPS.	Exclude	Within theoretical EZoI but no effect-receptor pathways identified.
Th18. West Thurrock Lagoon	1.4km north-west of KPS and 4.2km west of the ExPS.	Exclude	Within theoretical EZoI but no effect-receptor pathways identified.

LWS	Approximate Distance and Direction from the Project Sites*	Include in or exclude from EclA?	Reasoning
Th22. Grenville Road Grasslands	2.0km north-west of KPS and 4.1km north-west of ExPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Th23. Anchor Field	1.7km north-west of KPS and 4.0km west of the ExPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Th24. Mill Wood and Cliff	2km north of KPS and 3.8km north-west of ExPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Th28. Lion Gorge	1.7km north-west of KPS and 3.4km north-west of ExPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Th31. Grays Pit Extensions	1.8km north of KPS and 2.3km north-west of ExPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Th38. Broom Hill	1.8km north of ExPS and 4.0km east of KPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.
Th49. Goshems Farm	1.8km east of ExPS and 5.1km east of KPS.	Exclude	Within theoretical EZol but no effect-receptor pathways identified.

*KPS = Kent Project Site; ExPS = Essex Project Site

Habitats/Flora

12.98 A full description of the habitats present within the Project Site is set out within Appendix 12.1: *Ecology Baseline Report* (Document Reference 6.2.12.1) and illustrated on the 'Extended Phase 1 Habitat Survey' plan (Figure 12.4; Document Reference 6.3.12.4). A summary of the habitats found and described onsite is provided in **Table 12.8**.

Table 12.8: Summary of the Distribution and Value of Habitats within the Project Site.

Habitat/Flora	Distribution within the Project Site	Intrinsic Ecological Importance
Rare plants	Populations of 13 nationally scarce species were found on Swanscombe Peninsula in the Kent Project Site 2016. Eight were recorded in 2020.	National , nationally scarce. Populations of the plants divided sedge (<i>Carex divisa</i>), yellow vetchling (<i>Lathyrus aphaca</i>), slender hare’s-ear (<i>Bupleurum tenuissimum</i>), Bithynian vetch (<i>Vicia bithynica</i>) and round-leaved wintergreen (<i>Pyrola rotundifolia subsp. maritima</i>) are listed as a reason for notification of the Swanscombe Peninsula SSSI.
Broad-leaved semi-natural woodland	Mainly in the South along the A2(T) corridor, some along the eastern boundary.	Local , owing to connectivity, good canopy species diversity, ground flora diversity and status as a Priority Habitat ⁷ .
Broad-leaved plantation woodland	Many areas throughout the Project Site.	Site , as small in extent and immature planting.
Scrub	Many areas throughout the Project Site.	Local , due to large extent on the Kent Project Site and structure, despite being a common habitat.
Tall ruderal	Small extent in station quarter south.	Site , owing to small extent and low species diversity.
Improved grassland	Small area in A2(T) corridor	Site , owing to low species diversity.
Poor semi-improved grassland	Botany marsh east, Broadness grasslands and former landfill (west of Ebbsfleet International Station). Includes areas within the overall OMHPDL.	Local , species diversity is low across most of extent, but forms large area of continuous habitat.
Semi-improved neutral and calcareous grassland	Neutral grassland in Broadness grassland area and to the west of Black Duck Marsh, calcareous grassland in Craylands Pit, Black Duck Marsh and north of Tiltman Avenue. Includes areas within the overall OMHPDL.	Local to District , some areas of lower botanical diversity but supports nationally scarce plant species. One small area of MG1d grassland in Broadness Grassland with increased value.

⁷ Priority habitats and species include those habitats and species which are ‘of principal importance for the purpose of conserving biodiversity’ under Section 41 of the Natural Environment and Rural Communities Act, 2006

Habitat/Flora	Distribution within the Project Site	Intrinsic Ecological Importance
Coastal/Floodplain Grazing Marsh	Botany Marsh West and part in Botany Marsh East.	District , a large area of Priority Habitat ⁸ coastal/floodplain grazing marsh.
Open mosaic on previously developed land	Large areas across the Kent Project Site where there is a verifiable history of industrial disturbance. Comprises an 'umbrella' habitat including several individual habitat components.	District , a large area of Priority Habitat ⁹ within the Kent Project Site. The areas are not floristically diverse but have the potential to support important invertebrate assemblages.
Amenity grassland and shrub	Small area concentrated around Northfleet and road- and trackside verges.	Negligible , owing to low species diversity, intensive management.
Marshy grassland	Small area in station quarter south.	Site owing to small extent and limited species diversity.
Waterbodies (ponds, temporary pools, standing water and ditches)	Scattered throughout the Project Site, ditches forming two main networks at Black Duck and Botany Marshes.	District - many ponds are leachate treatment lagoons or contaminated by leachate. The remaining ponds and ditches support little vegetation other than reeds. Ditch network forms part of a large marsh area including Botany Marshes LWS and adjacent grazing marsh and is considered of District level.
Swamp (reedbed)	Black duck Marsh and Channel Tunnel Rail Link (CTRL) Wetland form extensive reedbed, smaller areas exist within Botany Marsh East and along ditch network.	County - Priority Habitat forming a large area of the Project Site in close proximity to the River Thames. Priority Habitat.
Bare ground	Mostly around Manor Way industrial Estate.	Negligible , no species diversity and surrounded by buildings.
Hardstanding and buildings	Mostly around Manor Way industrial Estate, Station Quarter North and the Essex Project Site.	Negligible , man-made structures.

⁸ UK Biodiversity Action Plan Priority Habitat Descriptions Coastal and Floodplain Grazing Marsh From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008

⁹ UK Biodiversity Action Plan Priority Habitat Descriptions Open Mosaic Habitats on Previously Developed Land (Updated July 2010) From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.

Habitat/Flora	Distribution within the Project Site	Intrinsic Ecological Importance
River Ebbsfleet	Along the eastern boundary of the Kent Project Site.	Local , as this river corridor and its associated riparian habitat provide a green corridor.

12.99 As shown on Figure 12.4 (Document Reference 6.3.12.4), and detailed in **Table 12.8**, the Essex Project Site comprises predominantly hardstanding, industrial land, whilst the Kent Project Site supports a range of habitats including, intertidal sediment, saltmarsh, wetlands, including running water (the River Ebbsfleet), open water (ponds), reedbed/swamp and ditch networks, a range of grasslands and open mosaic habitats, arable, scrub, woodland, chalk cliffs/exposures, buildings and bare ground. The saltmarsh and intertidal habitat are described and evaluated in ES Chapter 13: Marine Ecology (Document Reference 6.1.13). Those habitats within the Project Site considered to be of local, or greater, value are taken forward as IEFs in the EclA.

12.100 In addition to the identification of specific important habitats within the EclA the contribution made by all existing habitats to the overall biodiversity value of the Project Site is fully accounted for within Appendix 12.2: *Biodiversity Net Gain Assessment* (Document Reference 6.2.12.2).

Swanscombe Peninsula SSSI

12.101 A number of the individual habitats on the Kent Project Site, as described in **Table 12.8**, form part of the Swanscombe Peninsula SSSI (considered an IEF of national importance). None of the individual habitats within the SSSI are identified as reasons for the notification, and therefore impacts upon these habitats themselves is not strictly covered through the assessment of effects upon the higher level IEF of the SSSI. Nevertheless, the mosaic of habitats present is clearly important to sustaining the assemblages of breeding birds and invertebrates that are reasons for notification, and therefore for the purpose of this EclA individual habitats are described, mapped and assessed independently (and as part of an open mosaic of habitats), irrespective of their inclusion within land notified as a SSSI.

12.102 Furthermore, there are instances where habitats which form part of the SSSI also occur on areas of land outside of the SSSI boundary, and therefore these habitats are also treated as individual habitat IEFs, such that impacts on the 'non-SSSI' areas can also be adequately assessed.

12.103 For the assessment of potential effects on habitats described later in this report, the quantities of habitat loss/damage is provided for the total area of the individual habitat (e.g. the loss of scrub habitat includes the total area of scrub habitat, regardless of its position in/out of the SSSI boundary).

12.104 The assessment of potential effects upon the rare plant populations recorded on the Kent Project Site is undertaken as part of the assessment of effects upon Swanscombe

Peninsula SSSI in regard to those plant populations, which are reason for notification of the SSSI (namely populations of the plants divided sedge (*Carex divisa*), yellow vetchling (*Lathyrus aphaca*), slender hare's-ear (*Bupleurum tenuissimum*), Bithynian vetch (*Vicia bithynica*) and round-leaved wintergreen (*Pyrola rotundifolia subsp. maritima*)). In addition, not all of the rare or scarce plants recorded on the Kent Project Site are listed as reasons for notification of the Swanscombe Peninsula SSSI, and therefore a separate assessment of these 'non-SSSI' plant populations is undertaken.

Open Mosaic Habitat on Previously Developed Land

12.105 A number of the individual habitats on the Kent Project Site, as described in **Table 12.8**, collectively form part of a much wider 'Open Mosaic Habitat on Previously Developed Land' (OMHPDL) (considered a Priority habitat). This includes areas of bare ground, ephemeral vegetation, open grassland (poor semi-improved grassland and semi-improved neutral and calcareous grassland) and patches of scrub (less than 2500m²)¹⁰, where there is verifiable history of industrial disturbance, and where the habitat characteristics as described within the Priority Habitat description¹¹ could be identified using professional judgement and knowledge of the Project Site. The extent and boundary of the OMHPDL as defined by the 2020 survey by EDP is shown on Figure 12.4 (Document Reference 6.3.12.4).

12.106 For the purpose of the habitat assessment within the EclA, the individual habitat components which form part of the open mosaic habitat are described and mapped individually in order to illustrate the extent and spatial distribution of the individual habitats which occur across the Kent Project Site, and to enable a robust assessment of individual habitats, including where this is required for the assessment of effects on species (e.g. assessing the impact of scrub loss on dormice). However, in recognition of their presence within the 'open mosaic habitat on previously developed land', these individual habitats are collectively grouped into an 'umbrella' IEF which is 'open mosaic habitat on previously developed land'.

12.107 In instances where habitats which form part of the OMHPDL also occur outside of this area (e.g. areas of open grassland that occur in areas considered to be OMHPDL and areas not considered to be), these habitats are also treated as individual habitat IEFs, such that impacts on the 'non-OMHPDL' areas can also be adequately assessed. For the assessment of potential effects on species/species assemblages described later in this report, the quantities of habitat loss/damaged is provided for the total area of the individual habitat (e.g. the loss of suitable scrub habitat for dormice includes the total area of suitable scrub habitat, regardless of its position in/out of the OMHPDL).

¹⁰ Large blocks of dense scrub (larger than 2500m² or smaller, adjacent blocks making up a similar area) were excluded

¹¹ UK Biodiversity Action Plan Priority Habitat Descriptions Open Mosaic Habitats on Previously Developed Land (Updated July 2010) From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.

Ancient Woodland

12.108 There are a number of areas of ancient woodland present along the A2 corridor, to the south of the Kent Project Site. Their location is shown on Figure 12.56: Tree Constraints Plan (Document reference: 6.3.12.56). As described within Appendix 12.9: Arboricultural Impact Assessment (Document reference: 6.2.12.9), ancient woodland is defined as an area which has been continuously wooded since at least 1600 AD¹² and includes ancient semi-natural woodland and plantation on ancient woodland. ‘Wooded continuously’ does not mean there has been continuous tree cover across the whole area. Not all trees in the woodland must be old. Open space, both temporary and permanent, is also an important component of ancient woodland.

12.109 As described in paragraph 175c of the NPPF, ancient woodland is recognised in planning terms as an irreplaceable habitat:

“Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists”.

12.110 Of those areas of ancient woodland shown on Figure 12.56 (Document reference 6.3.12.56), Darenth Woods is designated as a SSSI (as described in Table 12.6 above), and therefore considered of national importance commensurate with its statutory designation.

12.111 The remaining areas of ancient woodland within the EZoI of the Proposed Development are not recognised as either SSSI or LWS. Within Kent, ancient woodlands are relatively well represented, and not all examples of ancient woodland would be considered of county/ national value.

12.112 For the purpose of the EclA, ancient woodland is considered an IEF of at least county value.

Species

12.113 As set out previously, information on protected and/or notable species within or near to the Project Site has been collected through a desk study and a range of field surveys. The findings of these investigations to date are set out in full within Appendix 12.1: *Ecology Baseline Report* (Document Reference 6.2.12.1) and summarised below.

Birds

Wintering Birds

12.114 A combined total of up to 44 species were recorded during 2012/13, 2014/15 and 2019/20 intertidal and high tide surveys. Of the 30 Ramsar/SPA/SSSI qualifying species mentioned

¹² <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#history>

in the Thames Estuary and Marshes and Medway Estuary and Marshes designation citations, a total of 22 have been recorded at either low or high tide during the winter 2019/2020. Of the 22 Ramsar/SPA qualifying species which have stated peak population counts, EDP recorded an overall total of 12 over the course of the winter 2019/20 high and low tide surveys, with the numbers recorded during surveys at either low or high tide between 0.07% and 8.66% of the peak population counts stated in the citations.

- 12.115 Over winter 2020/2021, intertidal surveys recorded no further species over those recorded previously within the Kent Project Site. Activity levels were broadly consistent with those recorded in previous years.
- 12.116 Intertidal surveys undertaken at the Essex Project Site during 2020/2021 recorded smaller numbers of species, possibly due to the limited intertidal zone and high levels of existing disturbance from the Port of Tilbury. A total of 11 species were recorded in the intertidal zone, with a further 7 species either flying over or passing along the channel of the river. Peak counts were also lower, with only 3 species surpassing 1% of the WeBS total for the Thames estuary (teal, redshank and little grebe).
- 12.117 As described in detail in Appendix 12.1 (Document Reference 6.2.12.1), in 2019/2020 it was concluded that although the Project Site itself is not regarded to have value at the International level, the wintering wader/wildfowl assemblage present within inland areas of the Kent Project Site itself must be valued at the International level given their status as functionally linked to the estuary assemblage.
- 12.118 Additionally, 28 other terrestrial species (non-wader, non-wildfowl species) of conservation concern were also recorded in generally low to moderate numbers, typically relating to individuals or small flocks of each species recorded on one or two survey visits, but also including a high diversity and moderate abundance of several species listed on Schedule 1 of the Wildlife & Countryside Act (WCA) and species of Conservation Concern. Therefore, the terrestrial wintering bird assemblage present within the Kent Project Site should be considered separately and is of County Importance.
- 12.119 The assessment of the wintering bird assemblage has been based on the completion of a comprehensive suite of wintering bird surveys collated during winter 2019/2020. In addition, this recent data is supplemented by a suite of 'baseline' surveys completed by Chris Blandford Associates (CBA) during 2012/2013, provided in full in Appendix 12.1 (Document Reference 6.2.12.1). The DCO application is therefore informed by two seasons of bird survey data, albeit not in consecutive years.
- 12.120 It is considered that the survey data gathered is sufficient and robust to inform the DCO application. The wetland habitats within the Kent Project Site have not changed significantly in the intervening years between the 2012/2013 baseline surveys and the recent 2019/2020 surveys, and the data collected is more or less consistent across that time period. As set out above the wintering wader/wildfowl assemblage using the Kent Project Site has been valued at the International level owing to its association with the nearby Ramsar and SPAs. The assemblage, which is treated as an IEF, has therefore been

valued at the highest level, and data from additional surveys will not affect this valuation or significantly alter the impact assessment and mitigation measures being developed.

12.121 Justification for the scope of surveys was provided to Natural England within an Ecology Briefing Note (edp5988_r022) issued 21 August 2020 (see Appendix 12.5; Document Reference 6.2.12.5). At the time of writing, no further comment has been made by Natural England in response to the Ecology Briefing Note.

Breeding Birds

12.122 As described in detail in Appendix 12.1 (Document Reference 6.2.12.1), the overall bird abundance was very high across the Project Site. A total of 99 species were recorded during the breeding bird surveys. Of those species recorded during the survey, 33 were confirmed as breeding within the survey area, 26 are considered to have probably bred, 18 to have possibly bred and the remaining 22 species are considered to be non-breeding species.

Schedule 1 Species

12.123 Fifteen species that are included on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded during the 2020 breeding bird surveys. Of these, greylag goose (*Anser anser*) (2-16 pairs), bearded tit (*Panurus biarmicus*; 3-5 pairs) and Cetti's warbler (*Cettia cetti*) (51-87 pairs) are confirmed breeding species; marsh harrier (*Circus aeruginosus*) (single pair) probably bred within the Kent Project Site; and spotted crake (*Porzana porzana*), little ringed plover (*Charadrius dubius*), barn owl (*Tyto alba*; one pair), kingfisher (*Alcedo atthis*) and peregrine falcon (*Falco peregrinus*) possibly bred. The remaining six species; whimbrel (*Numenius phaeopus*), greenshank (*Tringa nebularia*), mediterranean gull (*Larus melanocephalus*), little tern (*Sternula albifrons*), redwing (*Turdus iliacus*) and black redstart (*Phoenicurus ochruros*) are considered to be non-breeding species.

12.124 A single spotted crake was recorded on the track by Pond P8 on the Kent Project Site in June by an ecologist who was completing invertebrate surveys. This species was not recorded during the breeding bird survey or during the nocturnal spotted crake survey, which was completed in late June after the incidental sighting. The Kent Project Site contains habitat that is suitable breeding habitat for this species so, based on the European Bird Census Council (EBCC) criteria, it is considered to be a possible breeding species, although based on the results of the survey effort it is more than likely that the incidental record relates to a migrant bird.

Green List Species

12.125 Green listed species were present in large numbers across all areas of the Kent Project Site surveyed. The most commonly recorded green listed species were wren (*Troglodytes troglodytes*), with a peak count of 87-155 pairs, whitethroat (*Sylvia communis*) with 85-130 pairs individuals, reed warbler (*Acrocephalus scirpaceus*) with 70-133 pairs, robin

(*Erithacus rubecula*) with 47-103 pairs, blackcap (*Sylvia atricapilla*) with 57-133 pairs, blackbird (*Turdus merula*) with 61-116 pairs, chiffchaff (*Phylloscopus collybita*) with 43-73 pairs, and most notably Cetti's warbler, a WCA Schedule 1 species, with 51-87 pairs. It is considered very likely that these species are breeding within the Kent Project Site. Peregrine falcon (*Falco peregrinus*), another Schedule 1 species, was also recorded hunting within the Kent Project Site.

Amber List Species

- 12.126 Twenty-nine Amber List Bird Species of Conservation Concern were recorded on or over the Kent Project Site during the 2020 breeding bird surveys including greylag goose, mute swan, shelduck, shoveler, gadwall (*Mareca strepera*), mallard, teal (*Anas crecca*), swift (*Apus apus*), stock dove (*Columba oenas*), spotted crake, oystercatcher, redshank, greenshank, black-headed gull (*Chroicocephalus ridibundus*), Mediterranean gull, common gull (*Larus canus*), great black-backed gull (*Larus marinus*), yellow-legged gull (*Larus michahellis*), lesser black-backed gull (*Larus fuscus*), little tern, common tern (*Sterna hirundo*), marsh harrier, kingfisher, kestrel (*Falco tinnunculus*), house martin (*Delichon urbicum*), willow warbler (*Phylloscopus trochilus*), dunnoek (*Prunella modularis*), bullfinch (*Pyrrhula pyrrhula*) and reed bunting (*Emberiza schoeniclus*).
- 12.127 Of the above species greylag goose, spotted crake, greenshank, little tern, marsh harrier and kingfisher are included on Schedule 1 and have been discussed above.
- 12.128 In terms of wetland birds, it is considered that the Kent Project Site supports a probable breeding pair of mute swan, up to eleven possible breeding pairs of shelduck, up to four pairs of possibly breeding shoveler, up to six probable breeding pairs of gadwall, between fourteen and seventeen probable breeding pairs of mallard, and one or two breeding pairs of oyster catcher. A single teal was recorded in April in Botany Marsh West; this species is considered to have possibly bred.
- 12.129 Redshank, black-headed gull, common gull, great black-backed gull, yellow-legged gull, lesser black-backed gull and common tern are all considered to be non-breeding birds and registrations of these species are limited to individual or low numbers of birds or of birds flying over the Kent Project Site.
- 12.130 In terms of non-wetland birds, swift and house martin (*Delichon urbica*) were recorded foraging but are not considered to have bred on the Kent Project Site, although there is suitable nesting habitat within the industrial area on the Swanscombe Peninsula on the Kent Project Site.
- 12.131 The Kent Project Site is considered to support up to 10 breeding pairs of stock dove, one to three pairs of probably breeding kestrel, a single breeding pair of willow warbler, 45 to 84 breeding pairs of dunnoek, 3 to 5 breeding pairs of bullfinch and seven to 14 breeding pairs of reed bunting.

Red List Species

12.132 Seventeen Red List Birds of Conservation Concern were recorded on the Kent Project Site during 2020 including pochard, cuckoo (*Cuculus canorus*), lapwing (possibly bred, 1 pair), whimbrel, herring gull (*Larus argentatus*; non breeding), skylark (9-13 possibly breeding pairs), grasshopper warbler (*Locustella naevia*; 12-15 probably breeding pairs), starling (*Sturnus vulgaris*) (likely just foraging), redwing, song thrush (*Turdus philomelos*) (up to 67 breeding pairs), mistle thrush (*Turdus viscivorus*; three breeding pairs), nightingale (*Luscinia megarhynchos*; 3 to 4 probably breeding pairs), black redstart, house sparrow (*Passer domesticus*; up to 8 probably breeding pairs), yellow wagtail (*Motacilla flava*; not breeding), grey wagtail (*Motacilla cinerea*; 1 breeding pair) and linnet (*Carduelis cannabina*; up to 39 breeding pairs).

12.133 Cuckoo are considered to have probably breed on the Kent Project site as adults were recorded between April and June 2020. The Kent Project Site supports suitable host species including dunnock and reed warbler.

Evaluation

12.134 The breeding bird assemblage found within the Kent Project Site is listed as a reason for notification of the Swanscombe Peninsula SSSI. The supporting information to the SSSI notification published by Natural England on 11 March 2021¹³ summarises the breeding bird assemblage as follows:

“two diverse assemblages of breeding birds: one associated with lowland open waters and their margins, lowland fen and lowland damp grassland; the other with lowland scrub.”

12.135 The Swanscombe Peninsula SSSI notification document¹⁴ provides a fuller description of the breeding bird assemblage, which is a reason for notification, as follows:

*“The wetland areas of the site support an assemblage of breeding birds of lowland damp grassland, lowland open waters and their margins and lowland fen. Species associated with the fen and swamp habitats of Black Duck Marsh and the CTRL wetlands include bearded tit *Panurus biarmicus*, marsh harrier *Circus aeruginosus* and the elusive water rail *Rallus aquaticus*. Wetland habitats across the site support reed bunting *Emberiza schoeniclus*, sedge warbler *Acrocephalus schoenobaenus* and reed warbler. The wetland mosaic with scrub supports Cetti’s warblers *Cettia cetti*.*

*Botany Marsh West is a surviving fragment of grazing marsh, providing damp grassland habitat for lapwing *Vanellus vanellus*. Little egret *Egretta garzetta* and grey heron *Ardea cinerea* utilise a number of wetland habitats and forage within the intertidal habitats of*

¹³ ‘Swanscombe Peninsula SSSI Kent – Supporting Information’. Natural England, published 11 March 2021.

¹⁴ ‘Swanscombe Peninsula SSSI Kent – Notification under Section 28C of the Wildlife and Countryside Act 1981.’ Natural England, published 11 March 2021.

*the adjacent River Thames. The water bodies support breeding waterfowl including pochard *Aythya ferina*, mute swan *Cygnus olor* and little grebe *Tachybaptus ruficollis*.*

*The chalk pits and areas of scrub support an assemblage of breeding birds of lowland scrub. Grasshopper warbler *Locustella naevia* can be found in open habitats on Broadness, while nightingale *Luscinia megarhynchos* favours the denser scrub areas of Botany Marsh East and the chalk pits. Linnets *Linaria cannabina* and lesser whitethroats *Curruca curruca* can be found in the former landfill tips and areas north of the CTRL wetlands."*

12.136 The two breeding bird assemblages found within the Kent Project Site, as described above, are therefore considered to be of National value. As the two breeding bird assemblages identified on the Kent Project Site are reasons for notification of the SSSI, the assessment of potentially significant effects upon the assemblages is included within the assessment of effects upon the higher tier IEF of the Swanscombe Peninsula SSSI.

Passage Birds

12.137 Full results of the passage bird surveys are discussed in Appendix 12.1 (Document Reference 6.2.12.1). In summary, the surveys recorded a total of thirty-seven species, including the following species listed as qualifying features of the Thames Estuary and Marshes SPA: ringed plover (*Charadrius hiaticula*), dunlin (*Calidris alpina*) and redshank. As described in full in Appendix 12.1 (Document Reference 6.2.12.1) the numbers of individual birds from each of these species recorded during the surveys constitute less than 1% of the SPA population and are not considered significant.

12.138 In terms of abundance and diversity of birds recorded, this was significantly reduced from that found along the estuary front throughout winter, with the most abundant birds being black-headed gulls and mallard. Three Peregrines were recorded flying over on 15 April 2020.

Bats

Bat Roosting – Trees

12.139 During the visual assessment for roosting bats on 04 June 2020, no bats or evidence of bats was found but a total of 19 trees within the Kent Project Site were identified as offering potential to support roosting bats. Following the aerial tree climbing surveys, no evidence of roosting bats was found in any of the trees and a further tree with moderate potential was identified and surveyed.

12.140 Therefore, in total nine trees have been identified on the Kent Project Site as having high potential, five as moderate potential and six as having low potential. No evidence of bat roosting has been recorded in any of the trees.

12.141 There are no trees with bat roosting potential within the Essex Project Site.

Bat Roosting – Buildings

12.142 A total of 150 buildings were identified from maps/aerial photographs within the Project Site. A preliminary ‘rapid assessment’ of these buildings from public footpaths and roads, was undertaken on 01 May 2020. The purpose of this survey was to determine whether any buildings could be scoped out as having negligible potential to support roosting bats, in order to focus the efforts of further external and internal inspections and presence/absence surveys as required. The assessment was undertaken by two Natural England licensed bat workers. Further visits to the Project Site were made on 07 July 2020, 15 July 2020 and 17 July 2020 to complete external building assessment.

12.143 Following these assessments 101 buildings were assessed as having negligible potential to support roosting bats, due to their construction, or were no longer present. These buildings were therefore not subject to any further level of survey.

12.144 A total of 23 buildings were found to have some level of potential to support roosting bats during the rapid assessment, with 10 assessed as having *Low potential*, 10 assessed as having *Moderate potential* and three assessed as having *High potential*.

12.145 An individual soprano pipistrelle (*Pipistrellus pygmaeus*) was recorded entering B67 during the survey on 27 August 2020. An individual common pipistrelle (*Pipistrellus pipistrellus*) was recorded entering B32 on 17 September 2020. It is considered B67 and B32 each support a summer day roost for individual bat(s) and it is likely the buildings are only occasionally used as other surveys on the buildings recorded no bats emerging.

12.146 No emergences or re-entries have been detected from any other buildings surveyed.

12.147 There remain a further 26 buildings that could not be accessed during 2020. Precautionary mitigation measures, including the need for pre-commencement surveys, are provided within the ‘Bat Mitigation Strategy’ enclosed within the EMMF (Document reference: 6.2.12.3).

Bat Roosting – Tunnels (Summer)

12.148 The assessment of roosting potential undertaken in August 2020 noted 10 tunnels with suitability for roosting, swarming and hibernating bats. For summer roosting; two tunnels had moderate potential and two had low. For autumn swarming; five had moderate potential, four low and one negligible. For winter hibernation; nine had low potential and one had negligible potential. Full details are included in Appendix 12.1 (Document Reference 6.2.12.1).

12.149 No emergences or re-entries have been detected from the tunnels indicating no tunnels are used as summer roosts

Bat Roosting – Tunnels (Autumn Swarming)

- 12.150 Static detectors deployed at the entrance of the tunnels in August and September recorded low levels of bat activity. Due to access constraints for health and safety reasons it was not always possible to position statics so that recordings were from solely within the tunnels themselves. As such it is difficult to determine absolutely whether behaviour can be attributed to autumn swarming or general foraging.
- 12.151 A number of the tunnels returned no records of bats or low numbers of recordings of an assemblage typical of the area including common pipistrelle, soprano pipistrelle, noctule (*Nyctalus noctula*), long-eared bat (*Plecotus auratus*) and *Myotis* bats. Of the tunnels surveyed, tunnel T7 and tunnel T16 recorded larger than average numbers of *Myotis* sp. calls. There were 14 *Myotis* recordings made between midnight and 1am on 25 September at tunnel T7 but no bats were recorded at tunnel T7 during the August or October deployments.
- 12.152 There were 42 *Myotis* recordings made between 10.30pm and midnight on 01 September 2020 were made at the south end of T16. Conversely, there were no *Myotis* calls recorded at the northern end of T16 during this time and, nor was there a distinct repeated peak of activity within the target period in August or October.
- 12.153 The results do not indicate autumn swarming behaviour by any species at the tunnels surveyed.

Bat Roosting – Tunnels (Winter)

- 12.154 The preliminary roost assessment of tunnels has identified that 1 of the tunnels has moderate potential to support hibernating bats, 7 tunnels have low potential and 1 has negligible potential. A further tunnel, TU/016, has negligible potential with the exception of a single large crack at the tunnel entrance which was considered to offer low potential.
- 12.155 The Proposed Development will not result in any direct impacts upon any of the tunnels with the exception of tunnels TU/016 (negligible/low potential) and TU/018 (low potential) which will be used for access between the transport interchange and staff accommodation.
- 12.156 Static detectors were deployed inside four tunnels and at the entrance of four tunnels in December 2020, January 2021 and February 2021. Due to access constraints for health and safety reasons it was not always possible to position static detectors so that recordings were from solely within the tunnels themselves.
- 12.157 Tunnel TU/07 recorded 38 *Myotis* sp. passes between December 2020 and February 2021, 1 common pipistrelle pass (19/01/21), and 1 soprano pipistrelle pass (13/02/21). This tunnel is considered to be a confirmed hibernation roost. Four tunnels (TU/011, TU/013A, TU/014A and TU/016) returned low numbers of recordings of common pipistrelle and soprano pipistrelle bats. It is unlikely that pipistrelle bat hibernation roosts were present in three of these tunnels but possible that common pipistrelle and soprano pipistrelle hibernation roosts were present in Tunnel TU/016 due to the time the bat passes were

recorded before sunrise and the bat detector was deployed inside the tunnel, eliminating the possibility of the detector recording bats passing by outside of the tunnel.

12.158 Based on the results of the surveys and assessment of the conservation status of the bat species present, the roosting bat assemblage is considered to be of District level importance, with the exception of the roosting bat assemblage present in Tunnels TU/07 and TU/016, which are considered to be of County level importance for a small number of hibernating bats (common and rarer *Myotis* species).

Bat Foraging/Commuting Activity

12.159 A bat assemblage of at least eight species has been recorded within the Kent Project Site. This assemblage includes one nationally rare bat; Nathusius' pipistrelle (*Pipistrellus nathusii*) and three Kent Red Data Book species; noctule, Leisler's bat (*Nyctalus leisleri*) and serotine (*Eptesicus serotinus*) (the latter also being a Kent BAP species), however, recordings from these species are few with 82.6-89.3% of activity resulting from common pipistrelle. Further details can be found in Appendix 12.1.

12.160 The total amount of activity was lowest along the A2(T) corridor and highest in Botany Marsh, Black Duck Marsh, the Swanscombe Peninsula and the NE tip. This is not surprising as the grassland and wetland habitat on these high activity areas provides good foraging habitat for bats. Land north of Tiltman Avenue recorded the highest average number of species.

12.161 The abundance and diversity of bat species recorded at the Kent Project Site is considered to be fairly typical of an urban edge site in south-east England with common and widespread generalist species such as common pipistrelle bats accounting for the vast majority of foraging and commuting activity. However, a number of rarer bat species were recorded using the Kent Project Site in low numbers including Nathusius' pipistrelle. Serotine bats are also recorded, which are considered rare in Kent.

12.162 The overall bat assemblage using the Kent Project Site, taking into consideration the presence of rare and uncommon species (albeit only present in low numbers), is considered to be of District level value.

12.163 Owing to the nature of the habitats present, being predominantly developed land with little natural vegetation present, the Essex Project Site is considered of negligible value to foraging/ commuting bats.

12.164 In their Discretionary Advice Service letter of 9th October 2020 (copy of which is enclosed as Annex EDP 13 to the EMMF (Document reference: 6.2.12.3)), Natural England have identified the potential for the Kent Project Site to be used by winter foraging bats, due to the nature of the habitats present and the proximity to the River Thames. Whilst no dedicated winter survey work was considered necessary to inform the EclA, nor requested by consultees during the EIA Scoping Opinion received in July 2020 or through the PEIR

consultation in July 2020, on a precautionary basis, the potential effects of the Proposed Development on potential winter foraging habitats is included.

Dormouse

Essex Project Site

12.165 Essex Field Club (EFC) returned one dormouse record from Tilbury Marshes, dated 2009, located c. 1.5km east of the Essex Project Site.

12.166 The Essex Project Site comprises predominantly hardstanding, being occupied by a large area used for vehicle storage, and buildings associated with Tilbury Ferry Terminal. It supports a small linear strip of scrub adjacent to seasonally wet ditches, which is isolated, and not considered suitable to support dormouse (*Muscardinus avellanarius*). Based on the lack of suitable dormouse habitat, it is considered highly unlikely that dormice are present within the Essex Project Site and on this basis, surveys for dormice were not undertaken. The level of survey effort at the Essex Project Site was not raised by consultees during consultation on the EIA Scoping (see Appendix 12.5; Document Reference 6.2.12.5) or PEIR (see Appendix 12.6; Document Reference 6.2.12.6).

Kent Project Site

12.167 During the 2020 update desk study Kent and Medway Biological Records Centre (KMBRC) returned 12 records of dormouse, including three records dating from 2017 near the Bluewater Shopping Centre. The closest of these was 250m west of the Kent Project Site. Another record from 2011 originated from a similar area between the Bluewater Shopping Centre and the A296. The other records were all over ten years old, none of which originated from within the Project Site.

12.168 In addition, the 2016 Dormouse report by Corylus Ecology showed dormouse records from the woodland running east-west just to the north of the A2(T) and within Darenth Woods SSSI (an ancient semi-natural woodland).

12.169 Nest tube surveys to confirm the presence/likely absence of dormouse have been completed within suitable habitat throughout the Kent Project Site between April and November 2020. The results are provided in full detail in Appendix 12.1 (Document Reference 6.2.12.1), along with a habitat suitability assessment in the Dormouse Mitigation Strategy enclosed within Appendix 12.3 (Document Reference 6.2.12.3), are summarised below. The following should be read in conjunction with Figure 12.19 (Document Reference 6.3.12.19) which shows the distribution of dormouse activity across each month surveyed, and Figure 12.20 (Document Reference 6.3.12.20) which summarises the survey findings and shows the locations of any evidence of likely breeding.

12.170 During the deployment of the tubes in April 2020, 3 individual dormice were found in old tubes that had remained on the Kent Project Site from previous surveys. Following this, during the May survey visit a total of 8 dormice and 4 nests found. During the August visit,

a total of 6 adult and 13 juvenile dormice were found along with 23 nests. In September across all tubes, a total of 26 adult and 15 juvenile dormice were found across the Kent Project Site along with 39 nests. In October, across all tubes, a total of 14 adult and 7 juvenile dormice were recorded, along with 51 nests. In November, 5 adult and 2 juvenile dormice were found, along with 67 nests.

12.171 In summary, surveys have confirmed that dormice are breeding/very likely breeding within the southern half of the Kent Project Site, including within the Sportsground, Bamber Pit, in the Former Landfill and in Station Quarter South. The habitats supporting breeding/likely breeding within these areas comprise unmanaged, dense, continuous scrub of moderate quality, which offers a suitable foraging resource throughout the active season. No evidence of breeding has been recorded on the Swanscombe Peninsula itself (taken to be the land north of Tiltman Avenue, London Road and Galley Hill Road).

12.172 The Swanscombe Peninsula supports large areas of moderate quality dense/continuous scrub offering year-round foraging due to the variety of woody species present, in addition to areas of low quality, species-poor scrub scattered over areas of rough, tussocky grassland. Dormouse surveys have confirmed the presence of individual (non-breeding) dormice on the Swanscombe Peninsula (north of Tiltman Avenue, London Road and Galley Hill Road), which is being used for foraging purposes during the summer months. Within parts of the Kent Project Site on the Swanscombe Peninsula, including Botany Marsh, Black Duck Marsh, NE tip and broadness grassland, only adults and nests have been found, with no evidence of breeding.

12.173 As such, it is considered that the Kent Project Site supports suitable foraging habitat for dormouse across the Swanscombe Peninsula, alongside some, albeit sub-optimal breeding/hibernation habitat within Station Quarter South, the former landfill, Bamber Pit and the Sports ground. The dormouse population within the Kent Project Site is considered of importance at the District level and is taken forward as an IEF.

Harvest Mouse

12.174 In 2020, one harvest mouse (*Micromys minutus*) record was returned by KMBRC dating from 1963 located within the peninsula on the Kent Project Site. Three records were returned from EFC records with only one from the last 10 years and none from the Project Site.

12.175 The 2020 surveys confirmed the continued presence of harvest mice on the Kent Project Site, with 11 full harvest mouse nests and a further three partial nests found as shown on Figure 12.23. The majority of the nests were found on Broadness Grasslands with a nest on the NE Tip and another nest in Botany Marsh.

12.176 A presence/absence surveys based on nest searches are unable to estimate population size, however the population is considered of at least local level value.

Badger

12.177 In 2020, KMBRC and EFC returned many records of badger. None of the records originate from within the Project Site. No evidence of badger (*Meles meles*) has been found during the Extended Phase 1 Survey or any other survey visits so far in 2020. It is not considered likely that badgers are using the Project Site and they will not be taken forward as an IEF.

Otter

12.178 The 2020 desk study returned no records of otter (*Lutra lutra*) from KMBRC or EFC.

12.179 A habitat suitability assessment completed across the Project Site (as presented in full in the Otter Mitigation Strategy within Appendix 12.3 (Document Reference 6.2.12.3)) confirmed that none of the habitats within the Essex Project Site are suitable for otter, due their being developed and heavily industrialised with the banks of the River Thames comprising either steep wharfs or concrete banks, and no inland water courses.

12.180 By comparison, the Swanscombe Peninsula on the Kent Project Site provides suitable otter foraging habitat with a mosaic of interconnected drainage ditches, reedbed and swamp, fringed by coastal saltmarsh and tidal creeks connected to the River Thames. Further assessment of the suitability of the individual parts of the Swanscombe Peninsula, including Black Duck Marsh, the CTRL wetland, Botany Marsh West, Botany Marsh East and the River Ebbsfleet, is provided in the Otter Mitigation Strategy within Appendix 12.3 (Document Reference 6.2.12.3).

12.181 An otter was sighted within Black Duck Marsh during the March 2020 wintering bird survey, and the habitat within the reedbeds, marshes and River Ebbsfleet is suitable. The population is considered likely to be of at least Local value.

Water Vole

12.182 In 2020, KMBRC returned 25 records for water vole (*Arvicola amphibus*), the most recent record originates from 2016 for a location 5.0km east of the Kent Project Site. The other records all predate 2005 with the majority originating from within the marshes in the north of the Kent Project Site. EFC returned six records of water vole with the most recent from 2009 from Thurrock Park.

12.183 As described above in relation to otter, the habitats on the Essex Project Site are not considered suitable for water vole. Large areas of the Swanscombe Peninsula provide suitable water vole foraging habitat due to the mosaic of wetland habitats present, including a connected network of ditches. Further information on the suitability of habitats on the Kent Project Site for water voles is provided in the Water Vole Mitigation Strategy enclosed within Appendix 12.3 (Document Reference 6.2.12.3).

- 12.184 The first water vole survey in June 2020 identified water vole signs in Botany Marsh East including extensive signs of feeding and many latrines. In addition, pockets of water vole signs were recorded along the western boundary of Botany Marsh West.
- 12.185 No further water vole signs were recorded in August 2020 however a single water vole latrine was identified on one of the rafts in Black Duck Marsh, and a single latrine was found within the ditch running along the edge of the northeast tip. No signs of water vole were found during either of the hand-search surveys on Botany Marsh West. Furthermore, no signs of water vole were recorded along the River Ebbsfleet.
- 12.186 Surveys of the Site in April 2021 found fresh evidence of water vole in Botany Marsh East only. No signs of water vole were recorded during a visual search completed during deployment of the water vole rafts by boat in June 2021, however, two droppings were recorded on a raft in the lagoon immediately north of the HS1 portal, within the CTRL wetland. No droppings or other evidence of water vole presence was recorded anywhere else within CTRL wetland or Black Duck Marsh during the July 2021 surveys.
- 12.187 The survey results would imply that there are populations present in three areas of the Kent Project Site; Botany Marsh (East and West), CTRL Wetland and Black Duck Marsh. A breeding population of water vole would meet the criteria for designation as an LWS in Kent.
- 12.188 The population on Black Duck Marsh is isolated. There are no water courses linking this marsh with other areas of the Kent Project Site. The water voles on Botany Marsh east and west and those on the NE Tip are linked. The population as a whole, occupying the Swanscombe Peninsula, is considered to be of District level value. The locations of all water vole signs are shown on Figure 12.21 (Document Reference (6.3.12.21)).

Other Mammals

- 12.189 KMBRC returned 62 records for hedgehog (*Erinaceus europaeus*) of which 10 records dated from within the last decade and EFC returned seven records with only three from the last decade. None originated from within the Project Site.
- 12.190 Ten records for common shrew (*Sorex araneus*) were returned by KMBRC with the majority originating from within the Project Site. Three old records were returned from EFC not from within the Project Site. Six records for pygmy shrew (*Sorex minutus*) were returned by KMBRC of these one originated from within the Project Site dating from 1975.
- 12.191 Four records of stoat (*Mustela erminea*) and five records of weasel (*Mustela nivalis*) were returned by KMBRC. Three of the weasel records originate from within the Project Site on the Swanscombe Peninsula. EFC returned a single weasel record from Tilbury.
- 12.192 Two records of brown hare (*Lepus europaeus*) were returned by KMBRC, and one from EFC. All originated from locations outside of the Project Site and the records were old records. Whilst all of the above species could potentially be supported by the Kent Project

Site, populations are considered likely to be of less than local importance. None of these species are likely to be supported by the Essex Project Site, based on the lack of suitable habitat present. Other mammals will not be taken forward as an IEF.

Great Crested Newt

12.193 KMBRC returned 29 records of great crested newts of which only one was from within the last decade. EFC returned seven records with only two from the last decade. That record dated from 2012 and was from 800m south of the Kent Project Site, to the south of Bean. No records were returned from within the Project Site.

12.194 All eDNA results were returned negative. Therefore, great crested newts are considered unlikely to be present and breeding within the Project Site and will not be taken forward as an IEF.

Other Amphibian Assemblage

12.195 In 2020, KMBRC and EFC returned many records for palmate newts (*Lissotriton helveticus*), smooth newt (*Lissotriton vulgaris*) common toad (*Bufo bufo*), marsh frog (*Pelophylax ridibundus*) and common frog (*Rana temporaria*). Only one smooth newt record was from the Project Site; however, there were incidental records of smooth newt and marsh frog from the Swanscombe Peninsula, smooth newt from Botany Marsh East and smooth newt and common toad from Bamber Pit during the 2015 surveys.

12.196 The extent of the wetland habitat and waterbodies within the Kent Project Site has the potential to support large numbers of amphibians and records suggest that smooth and palmate newt, common toad and common frog are present. On a precautionary basis, it is therefore considered that the Kent Project Site supports an amphibian assemblage, valued at the local to District level.

Reptiles

12.197 In 2020, KMBRC returned many reptile records. The majority of records were from the Old Malbeon Hospital which is located 1.5km west of the Kent Project Site. There were 189 records for common lizard (*Zootoca vivipara*) (nine of which were from within the Kent Project Site), 104 records of slow worm (*Anguis fragilis*) (two from within the Kent Project Site) and 22 records of grass snake (*Natrix helvetica helvetica*) (three from within the Kent Project Site) returned.

12.198 KMBRC returned 53 records of adder (*Vipera berus*) but none of these were from within the Project Site. EFC returned less records of all four species, none of which were from within the Project Site.

12.199 As described in full detail in Appendix 12.1 (Document Reference 6.2.12.1), surveys have confirmed the presence of an *exceptional* grass snake population (peak survey count = 11 individuals), and *exceptional* common lizard population (peak survey count = 21

individuals) on Swanscombe Peninsula, including land within Black Duck Marsh, Botany Marsh, Broadness Grassland, CTRL wetland, NE tip, and SW tip.

12.200 Due to the presence of barriers to dispersal such as existing roads, built development or topographical barriers afforded by the chalk spines and steep pits, the reptile population recorded within some parts of the Kent Project Site are considered isolated. Within these isolated areas, surveys have confirmed the following populations present:

- Craylands Pit – *exceptional* slow-worm population (peak survey count = 39 individuals), and *good* common lizard population (peak survey count = 5 individuals);
- Bamber Pit – *good* slow-worm population (peak survey count = 14 individuals), *low* common lizard population (peak survey count = 3 individuals), and *low* grass snake population (peak survey count = 1 individuals);
- Sports Ground – *low* common lizard population (peak survey count = 2 individuals);
- Former landfill – *low* slow-worm population (peak survey count = 2 individuals), *good* common lizard population (peak survey count = 9 individuals), and *low* grass snake population (peak survey count = 1 individual);
- Station Quarter North – *low* common lizard population (peak survey count = 1 individual); and
- Station Quarter South – *low* slow-worm population (peak survey count = 3 individuals), *exceptional* common lizard population (peak survey count = 23 individuals), and *low* grass snake population (peak survey count = 2 individuals).

12.201 For the purpose of the EclA the reptile populations recorded are considered collectively as an IEF of district value.

12.202 Reptiles are not considered to be present on the Essex Project Site due to the lack of suitable habitat.

Invertebrates

12.203 The Essex Project Site does not support any habitat with potential to support a significant assemblage of terrestrial and aquatic invertebrates.

12.204 The Kent Project Site contains a large complex of habitats offering very diverse array of different micro-habitats and, accordingly, it supports a diverse range of terrestrial and aquatic invertebrate species.

12.205 Rather than one particular habitat being of key importance, the value of the Kent Project Site to invertebrates lies in its complex mosaic of habitats in which a range of different successional stages and are represented and in which other environmental conditions

such as water/moisture levels and salinity vary significantly. These conditions are in large part the result of a long history of modification and disturbance by industrial activity which continues on the site to the present day. The mosaic of habitats formed upon previously disturbed or made ground, which cover large portions of the Swanscombe Peninsula and the disused chalk pits in the Ebbsfleet Valley, meet the definition of Open Mosaic Habitats on Previously Developed Land (OMH) which are known to support particularly diverse invertebrate populations.

12.206 The habitat mosaics of particular importance to invertebrates are as follows:

- Dry habitats on made ground and/or hardstanding with well drained generally nutrient poor thin soils and supporting a mosaic of bare ground, early colonising/ephemeral vegetation, grassland and scrub; and
- Fresh water and brackish wetland habitats predominantly comprising saltmarsh reedbed, and marshy grassland but including open water (ponds, ditches and streams).

12.207 The previous surveys and assessment of the invertebrate population at the Project Site in 2012 and 2015 considered terrestrial and aquatic invertebrate populations as somewhat separate entities and the previous were divided on these lines. However, in reality there is continuum between wet and dry conditions, and many species of conservation importance rely on habitats at the transition between the two. The 2020 invertebrate survey and assessment recognises transitional as well as purely wet or dry biotopes and habitat types. Therefore, whilst the aquatic invertebrate survey findings will play a specific and separate role in assessing the water quality within the Project Site's waterbodies, the evaluation of the invertebrate population, the assessment of impacts and the strategy for avoidance and mitigation of impacts will consider the invertebrate assemblage as a whole.

12.208 From the combined 2020 survey area a total of 1,446 invertebrate species were recorded, comprising 1,304 derived from terrestrial sampling methods and 142 from aquatic sampling.

12.209 In total, 204 species of recognised conservation status in the UK were recorded from the 2020 survey. These included 10 species listed as 'Species of Principal importance' and two 'research only' species under Section 41 of the NERC Act (2006); as well as 33 species listed in one of the pre-1994 or post-2001 IUCN red data book categories as being RDB3 or 'Near Threatened', or rarer and 159 species currently classed as Nationally Scarce in the UK.

12.210 Evaluation of the 2020 survey results indicates that the whole Kent Project Site supports an invertebrate population of National Importance; whilst the majority of sites within the survey area have been found to support representative invertebrate assemblages of National Importance, usually the aquatic elements of the freshwater habitats and the more wooded areas were of somewhat lower conservation value. However, the interdependence of species requiring a combination of one or more habitat means that

the value of wooded and wetland elements in relation to open ground habitats should not be disregarded.

12.211 From evaluation of the 2020 survey results on a sub-site level; ten of the 17 sample areas were found to support invertebrate assemblages of National Importance; five sample areas were considered to support assemblages of Regional importance; one sample area was assessed as supporting an assemblage of County Importance; and one sample area (Tilbury Docks, verges) was considered to support an assemblage of District importance at most.

Evaluation

12.212 The invertebrate assemblages found within the Kent Project Site is listed as a reason for notification of the Swanscombe Peninsula SSSI. The supporting information to the SSSI notification published by Natural England on 11 March 2021¹⁵ summarises the invertebrate interest as follows:

“assemblages of invertebrates chiefly associated with bare sand and chalk; open short swards; open water on disturbed mineral sediments; and saltmarsh and transitional brackish marsh”.

12.213 The Swanscombe Peninsula SSSI notification document¹⁶ provides a more detailed description of the four invertebrate assemblages present, which is a reason for notification, as follows:

“Extensive areas of open mosaic habitat on previously developed land and semi-natural habitat including chalk pits, free-draining grassland, scrub, wetlands, grazing marsh and saltmarsh support four diverse assemblages of invertebrates.

*Brownfield areas within the SSSI support assemblages of species associated with bare sand and chalk, and open short swards. These assemblages are rich in bee and wasp species which use the open substrates for nesting, prey collection and basking, and the rich wild flower resource for nectar and pollen. Priority Species (Section 41) within the assemblage include the Critically Endangered distinguished jumping spider *Sitticus distinguendus*, rare five-banded weevil-wasp *Cerceris quinquefasciata* and Nationally Scarce brown-banded carder bee *Bombus humilis*.*

Wetland areas, primarily Black Duck Marsh and ponds resulting from construction of the Channel Tunnel Rail Link (CTRL), support assemblages of species associated with open water on disturbed mineral sediments, and saltmarsh and transitional brackish marsh. These wetlands support 84 species of water beetle. This represents over a quarter of the

¹⁵ ‘Swanscombe Peninsula SSSI Kent – Supporting Information’. Natural England, published 11 March 2021.

¹⁶ ‘Swanscombe Peninsula SSSI Kent – Notification under Section 28C of the Wildlife and Countryside Act 1981.’ Natural England, published 11 March 2021.

UK water beetle fauna. Notable species include the nationally scarce Enochrus halophilus, and the nationally rare great silver water Beetle Hydrophilus piceus.”

12.214 The invertebrate assemblages present are recognised as being of national importance and treated as an IEF of national value within this EclA. For the purpose of this assessment, the invertebrate assemblages are grouped collectively as an IEF, but impacts and mitigation are considered on each assemblage separately where relevant.

12.215 As the four invertebrate assemblages identified on the Kent Project Site are reasons for notification of the Swanscombe Peninsula SSSI, the assessment of potentially significant effects upon the assemblages is included within the assessment of effects upon the higher tier IEF of the Swanscombe Peninsula SSSI.

Freshwater Fish

Previous Surveys

12.216 A fish survey of the River Ebbsfleet initially undertaken by Coclough and Coates Aquatic Consultants in 2015 (see Appendix 12.1; Document Reference 6.2.12.1) captured modest populations of mature roach and perch. The fish surveys identified no evidence of active recruitment to the fishery, such that a population present within the River Ebbsfleet is not self-sustaining in the long-term. It was considered that fish populations within the River Ebbsfleet could either be wash outs from local fisheries or may have been introduced by anglers.

12.217 A fish survey of waterbodies across Swanscombe Marshes in August 2015 recorded three-spined stickleback in small numbers, in isolated locations in the eastern complex of Swanscombe Marshes and on the bottom edge of Botany Marshes. No fish were captured anywhere in the western complex of Swanscombe Marshes despite suitable conditions. Overall, survey effort identified a poor head of fish within waterbodies comprising Swanscombe marshes, likely attributed to poor water quality and anaerobic bed conditions in addition to saline intrusion and unstable water levels observed during 2015.

12.218 A desk study request to the Environment Agency confirmed there are no Environment Agency monitoring stations along the River Ebbsfleet and no historical data with respect to an assessment of fish communities. This is with the exception of a single fish survey undertaken by the Environment Agency during 2007 (adjacent to Ebbsfleet International Station) during which no fish were captured.

2020 Surveys

12.219 Further fish surveys of waterbodies comprising Swanscombe Marshes (where access was possible) confirmed the continued absence of a significant fish assemblage, likely attributed to poor water quality, anaerobic bed conditions in addition to saline intrusion. No fish were captured at any of the survey sites or observed during survey effort whilst the ditch network across Botany Marsh was predominantly dry.

12.220 Particularly given limitations to survey effort, it is assumed that several of the wet drains and ponds have potential to support some fish species, such as three spined stickleback as previously recorded during 2015.

12.221 With respect to the River Ebbsfleet, fish populations are considered to be constrained by the availability of suitable habitat whilst the presence of significant culverts at both the upstream and downstream extent of the River Ebbsfleet are considered a significant barrier to the fish movement and migration. As such, a freshwater fish community within waterbodies across the Project Site are considered to be of no more than Site importance.

12.222 The freshwater fish assemblage is not an IEF as the value is considered likely to be at a Site level only however, due to consultation responses from the Environment Agency (see Appendix 12.5; Document Reference 6.2.12.5), the freshwater fish assemblage will be taken forward and considered within the EclA to inform a 'no deterioration assessment' of on-site waterbodies.

Summary of Important Ecological Features

12.223 Based on the baseline ecological information described above (and presented in full in Appendix 12.1; Document Reference 6.2.12.1), a number of IEFs have been identified and are summarised in **Table 12.9**.

Table 12.9: Important Ecological Features to be Considered Within the EclA.

Important Ecological Feature	Key Attributes	Nature Conservation Value
Designations		
Thames Estuary and Marshes SPA/Ramsar	Extensive intertidal mudflats with saltmarsh and channel systems. Internationally importance assemblage of birds and wintering populations of many wader species.	International

Important Ecological Feature	Key Attributes	Nature Conservation Value
Medway Estuary and Marshes SPA/Ramsar/SSSI	<p>Single tidal system with the Swale and joins the southern part of the Thames Estuary between the Isle of Grain and Sheerness. Internationally importance of assemblage of birds and wintering populations of many wader species.</p> <p>The Medway Estuary and Marshes form the largest area of intertidal habitats which have been identified as of value for nature conservation in Kent and are representative of the estuarine habitats found on the North Kent coast. A complex of mudflats and saltmarsh is present with in places grazing marsh behind the sea walls which is intersected by dykes and fleets. The area holds internationally important populations of wintering and passage birds and is also of importance for its breeding birds. An outstanding assemblage of plant species also occurs on the site.</p>	International
North Downs Woodland SAC	Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which the area is considered to support a significant presence. Asperulo-Fagetum beech forests for which this is considered to be one of the best areas in the United Kingdom. Taxus baccata woods of the British Isles for which this is considered to be one of the best areas in the United Kingdom.	International

Important Ecological Feature	Key Attributes	Nature Conservation Value
Swanscombe Peninsula SSSI	<p>Swanscombe Peninsula SSSI is a corridor of habitats connecting Ebbsfleet Valley with the southern shore of the River Thames between Dartford and Gravesend. Industrial processes such as engineering, power generation, landfill and dredging have left a legacy of low nutrient and often toxic substrates, which have developed into bare open ground habitats with low scrub cover. The peninsula also supports wetland, grazing marsh and saltmarsh habitats. These habitats, coupled with a mild climate, provide ideal conditions for certain species and assemblages of plants, invertebrates and breeding birds. The SSSI is of interest for the following biological interest features:</p> <ul style="list-style-type: none"> • Vascular plants - populations of the plants divided sedge (<i>Carex divisa</i>), yellow vetchling (<i>Lathyrus aphaca</i>), slender hare's-ear (<i>Bupleurum tenuissimum</i>), Bithynian vetch (<i>Vicia bithynica</i>) and round-leaved wintergreen (<i>Pyrola rotundifolia subsp. maritima</i>); • Invertebrates - assemblages of invertebrates associated with bare sand and chalk, open short swards, open water on disturbed mineral sediments and saltmarsh and transitional brackish marsh; and • Breeding birds - two diverse assemblages of breeding birds, one associated with lowland open waters and their margins, lowland fen and lowland damp grassland, the other with lowland scrub. 	National
Darenth Woods SSSI	Some of the most valuable areas of ancient semi-natural woodland in north-west Kent with rare woodland types.	National
Medway Estuary and Marshes SSSI	Component SSSI to the Medway Estuary and Marshes SPA/Ramsar. Forms the largest area of intertidal habitats that have been identified as of value for nature conservation in Kent, and are representative of the estuarine habitats found on the North Kent coast. A complex of mudflats and saltmarsh is present with in places grazing marsh behind the sea walls, which is intersected by dykes and fleets.	National

Important Ecological Feature	Key Attributes	Nature Conservation Value
Shorne and Ashenbank Woods SSSI	A complex of ancient and plantation woodland, and includes a variety of stand-types associated with Tertiary gravels, clays and sands. The site supports an important and diverse invertebrate fauna.	National
Inner Thames Marshes SSSI	<p>Largest remaining expanse of wetland bordering the upper reaches of the Thames Estuary.</p> <p>Diverse bird interest especially the variety of breeding birds and the numbers of wintering wildfowl, waders, finches and birds of prey.</p>	National
South Thames Estuary and Marshes SSSI	<p>Component SSSI to the Thames Estuary and Marshes SPA/Ramsar.</p> <p>Extensive mosaic of grazing marsh, saltmarsh, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes. Freshwater pools and some areas of woodland provide additional variety and complement the estuarine habitats. Supports outstanding numbers of waterfowl, total counts regularly over 20,000.</p>	National
West Thurrock Lagoon and Marshes SSSI	One of the most important sites for wintering waders and wildfowl on the Inner Thames Estuary. Extensive intertidal mudflats together with a large and secure high tide roost, attracts waders in nationally important numbers, with significant populations of other bird species. The adjacent Stone Ness saltmarsh is noted for the size and character of its high marsh plant community.	National
Mucking Flats and Marshes SSSI	<p>Mucking Flats and Marshes is the underpinning SSSI for the Thames Estuary and Marshes SPA. It comprises an extensive stretch of Thames mudflats and saltmarsh, together with sea wall grassland. Wintering wildfowl and waders reach both nationally and internationally important numbers on the mudflats, roosting and feeding on adjacent saltmarsh and disused silt lagoons.</p> <p>The mudflats form the largest intertidal feeding area for wintering wildfowl and waders west of Canvey Island on the north bank of the Thames</p>	National

Important Ecological Feature	Key Attributes	Nature Conservation Value
Cobham Woods SSSI	Woodland and old parkland representative of acidic Thanet Sands and chalk soils. An outstanding assemblage of plants is present at this site, which is also of importance for its breeding birds. Includes an area of arable land, which is notable for the number of uncommon annual plant species.	National
Great Crabbles Wood SSSI	Representative of woods on North West Kent Tertiary sediments. Mostly mixed coppice under oak standards, with sweet chestnut as the dominant species. A number of scarce plants occur, including lady orchid and man orchid.	National
Wouldham to Detling Escarpment SSSI	Component SSSI of the North Downs Woodland SAC. Designated for chalk grassland, woodland and invertebrate interest.	National
Botany Marshes LWS	Reedbed and potential for ditch & grazing marsh restoration. Reedbed and grazing marsh are of principal importance in England. Also supports three species of reptile, water vole, otter and is of value to birds.	County
Ebbsfleet Marshes, Northfleet LWS	Range of habitats including reedbed, calcareous stream, lake, scrub, woodland, calcareous and neutral grassland. Protected species have been recorded including reptiles and great crested newts.	County
Alkerden Lane Pit LWS	Contains nationally scarce plants and Kent's largest population of green-flowered helleborine (<i>Epipactis phyllanthes</i>). Also contains round leaved wintergreen (<i>Pyrola rotundifolia</i>) and several species of nationally rare and scarce invertebrates.	County
Disused Hospital Grounds, Mabledon LWS	Designated for its chalk habitats including chalk grassland. The designation contains mixed scrub. The habitats within the designation support reptiles and lepidoptera.	County
Tilbury Marshes LWS	Diverse saltmarsh flora. Good grazing-marsh flora. An important invertebrate habitat destroyed by development, but some of the key species may survive on these remaining fragments.	County
Habitats/Flora		

Important Ecological Feature	Key Attributes	Nature Conservation Value
Rare plants	Populations of 13 nationally scarce species were found in 2016. Eight species were recorded in 2020, along with an additional two species not recorded previously. Populations of the plants divided sedge (<i>Carex divisa</i>), yellow vetchling (<i>Lathyrus aphaca</i>), slender hare's-ear (<i>Bupleurum tenuissimum</i>), Bithynian vetch (<i>Vicia bithynica</i>) and round-leaved wintergreen (<i>Pyrola rotundifolia subsp. maritima</i>) are listed as a reason for notification of the Swanscombe Peninsula SSSI. The assessment of effects upon these notified features of the Swanscombe Peninsula SSSI is undertaken as part of the assessment of effects upon the SSSI.	National
Broad leaved Semi Natural Woodland	Woodland with good canopy species and ground flora species diversity. Connects to other woodlands in wider area. Meets criteria for Priority habitat.	Local
Ancient woodland	Considered an irreplaceable habitat in planning terms, with Darenth Woods also designated as a SSSI. Remaining areas of ancient woodland not designated as SSSI or LWS. Collectively, considered of county value.	County
Scrub	Extensive mature and colonising scrub forming a corridor of woody habitats between the A2(T) and the River Thames.	Local
Semi-improved grassland	Including areas of species-poor semi-improved grassland and areas of semi-improved neutral, and calcareous grassland (with relict areas of more species-rich grassland of NVC MG1d and CG2 but not extensive or fine examples).	Local to District
Coastal/Floodplain Grazing Marsh	Botany Marsh West - Priority Habitat ¹⁷ coastal/floodplain grazing marsh. Would qualify as a LWS.	District

¹⁷ UK Biodiversity Action Plan Priority Habitat Descriptions Coastal and Floodplain Grazing Marsh From: UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008

Important Ecological Feature	Key Attributes	Nature Conservation Value
Open mosaic on previously developed land	<p>Large areas across the Kent Project Site where there is a verifiable history of industrial disturbance, and which fulfil the Priority Habitat description.</p> <p>Comprises an ‘umbrella’ IEF which includes a range of individual habitat types, including areas bare ground, ephemeral vegetation, open grassland (poor semi-improved grassland and semi-improved neutral and calcareous grassland) and patches of scrub (less than 2500m²).</p>	District
Waterbodies (ponds, temporary pools, standing water and ditches)	Extensive ditch network around the peninsula with associated ponds. Ditch network forms part of a large marsh area including Botany Marshes LWS and adjacent grazing marsh and is considered of District level. Some ponds, within Broadness grassland particularly, are contaminated by leachate from the nearby cement production facility and are of negligible ecological value.	District
Swamp (reedbed)	Three main areas in Black Duck Marsh, CTRL wetland and Botany Marsh, the latter of which is partially designated as a LWS. The other areas could qualify as LWSs and all qualify as Priority Habitat.	County
River Ebbsfleet	Acts as a wildlife corridor and is linked to reed bed and woodland habitats. Moderate water quality.	Local
Species		
Wintering waterfowl and wading bird assemblage	Supports many of the species associated with the nearby SPA/Ramsar Sites (albeit only a small proportion of the total populations).	International
Wintering terrestrial bird assemblage	28 species of conservation concern recorded in low to moderate numbers.	County

Important Ecological Feature	Key Attributes	Nature Conservation Value
Breeding Bird Assemblage	<p>99 species recorded of which 29 were listed on the Amber list of Birds of Conservation Concern, and 17 on the Red list. Of the 99 species, 77 have been confirmed breeding or possibly breeding, and the other 22 species confirmed as non-breeding.</p> <p>Two distinct breeding bird assemblages are present on the Kent Project Site, including one associated with lowland open waters and their margins, lowland fen and lowland damp grassland; and one associated with lowland scrub. The wetland breeding bird assemblage includes a nationally significant population of pochard (7-10 pairs present, which equates to between 0.99% and 1.4% of the national breeding population).</p> <p>The two breeding bird assemblages found on the Kent Project Site are listed as a reason for notification of the Swanscombe Peninsula SSSI.</p> <p>The assessment of potentially significant effects upon the assemblages is included within the assessment of effects upon the higher tier IEF of the Swanscombe Peninsula SSSI.</p>	National

Important Ecological Feature	Key Attributes	Nature Conservation Value
Bat assemblage	<p>Assemblage of at least eight species, including one Kent BAP species. However, the activity is predominantly of common pipistrelle bats.</p> <p>Two buildings on the Kent Project Site with confirmed bat roosts, including a common pipistrelle summer day roost within building B32 and a soprano pipistrelle summer day roost within building B67. Other buildings with high/moderate/low potential to support roosting bats are also present, as well as buildings that could not be surveyed due to access restrictions.</p> <p>No tree roosts confirmed but nine trees with high bat roost potential, five with moderate bat roost potential and six with low bat roost potential are present.</p> <p>Three tunnels (TU/011, TU/013A and TU/014A) returned low numbers of recordings of common pipistrelle and soprano pipistrelle bats during monitoring for winter hibernation but considered unlikely to be hibernation roosts. One tunnel (TU/018) with low hibernation potential was not surveyed due to access restrictions.</p>	District
Bat assemblage Tunnel TU/07 and TU/016 hibernation roost	<p>Tunnel TU/07 confirmed as a winter hibernation roost for <i>Myotis</i> sp and potentially low numbers of pipistrelle species.</p> <p>Tunnel TU/016 possible winter hibernation roost for low numbers of common pipistrelle and soprano pipistrelle bats.</p>	County

Important Ecological Feature	Key Attributes	Nature Conservation Value
Dormouse	Confirmed present within the Kent Project Site. Activity greatest within the former landfill, with the majority of nests, adults and juveniles found there. Confirmed breeding/ considered very likely breeding within the southern half of the Kent Project Site in Station Quarter South, former landfill, Bamber Pit and the Sports ground. Individuals dispersing across to the Swanscombe peninsula (taken to be the land north of Tiltman Avenue, London Road and Galley Hill Road) for summer foraging, with no evidence of breeding on the peninsula. Likely to be a meta population with that close to the Bluewater shopping centre.	District
Otter	Confirmed present within Black Duck Marsh, and assumed present in low numbers on the suitable habitat throughout the ditch network, reedbeds, marshes and on the River Ebbsfleet.	Local
Water vole	Latrines and feeding signs found in Botany Marsh East and West and NE tip – likely breeding and therefore meets LWS selection criteria.	Local to district
Harvest mouse	Confirmed present on Swanscombe Peninsula especially in Broadness grassland and on Botany Marsh.	Local
Amphibian assemblage	Likely to support four species and meets criteria for LWS selection.	Local to district
Reptile assemblage	Three species supported, with several populations of varying sizes across the Kent Project Site. Many parts of the Kent Project site meet criteria for LWS selection.	District

Important Ecological Feature	Key Attributes	Nature Conservation Value
Invertebrates	<p>Invertebrate assemblage comprising a total of 1446 species, comprising 1,304 derived from terrestrial sampling methods and 142 from aquatic sampling. A total of 142 species of recognised conservation status in the UK were recorded from the 2020 survey, including 10 species listed as ‘Species of Principal importance’ and two ‘research only’ species under Section 41 of the NERC Act (2006); as well as 33 species listed in one of the pre-1994 or post-2001 IUCN red data book categories as being RDB3 or ‘Near Threatened’, or rarer and 159 species currently classed as Nationally Scarce in the UK.</p> <p>Four distinct invertebrate assemblages are present on the Kent Project Site including assemblages of invertebrates chiefly associated with bare sand and chalk; open short swards; open water on disturbed mineral sediments; and saltmarsh and transitional brackish marsh. The invertebrate assemblages on the Kent Project Site are reasons for notification of the Swanscombe Peninsula SSSI. Therefore, the assessment of potentially significant effects upon the assemblages is included within the assessment of effects upon the higher tier IEF of the Swanscombe Peninsula SSSI.</p>	National

12.224 In accordance with the assessment methodology described at paragraph 12.40, all other habitats and species/species groups are deemed to be of only Site level nature conservation importance or less, and will not be taken forward for detailed assessment, since effects upon such features are unlikely to be ‘significant’ in EIA terms.

12.225 This is with the exception of a freshwater fish assemblage which are considered to inform a ‘no deterioration assessment’ of the River Ebbsfleet, as described above, and provided in Appendix 12.8 (Document Reference 6.2.12.8).

Future Baseline Conditions

12.226 In the absence of development and cessation of industrial practices, the Kent Project Site is likely to be subject to further scrub encroachment and natural succession through to woodland, although this process would be relatively slow owing to the nutrient poor skeletal soils and highly alkaline conditions which would suppress rates of vegetation colonisation and growth. The notification of the majority of the Kent Project Site as Swanscombe Peninsula SSSI places a responsibility on the landowners to maintain the SSSI

in favourable condition, however, it is likely to be challenging to replicate the previously unplanned disturbances and deposition of industrial waste products etc. which have created the current site conditions.

12.227 Material changes in the habitat composition and the species populations they support are unlikely to occur during the relatively short time period between the recent surveys and construction activities starting on site. However, in the medium to long-term, it is anticipated that the existing species populations/assemblages which are dependent on woody/scrub habitats, such as for example the terrestrial breeding bird assemblage and dormice would flourish, whilst others, reliant on open grassland/marsh habitats and an 'open mosaic', including for example waders, waterfowl, reptiles and invertebrates, would diminish.

12.228 There is also evidence of fly tipping, littering, illegal camping, and fires across the Kent Project Site, which has a negative impact on the existing biodiversity, and can reasonably be expected to continue if the site remains undeveloped, albeit the SSSI notification may assist in discouraging some of these damaging activities.

POTENTIAL SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSALS

Mitigation Hierarchy

12.229 The mitigation hierarchy requires that the design of a development follows what is known as the mitigation hierarchy to reduce impacts upon Important Ecological Features (IEFs). The Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines for Ecological Impact Assessment (EclA)¹⁸ outline the principles as follows:

'Avoidance: Seek options that avoid harm to ecological features (for example, by locating on an alternative site).

Mitigation: Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.

Compensation: Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.

Enhancement: Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.'

12.230 The Project Site was chosen by the project team after careful consideration of a number of sites from a wide search area which included land within 100km of central London. The

¹⁸ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

full consideration of alternative sites and site selection process is detailed in full in Chapter 4: *Project development and alternatives* (Document Reference 6.1.4).

12.231 The Project Site was selected as the preferred location following review of a number of criteria including (in no order of priority) land availability, land use, planning and environmental constraints, proximity to and connectivity with central London, transport and accessibility, environmental constraints, planning constraints, regeneration and economic benefit and micro-climate. The Swanscombe Peninsula was subsequently chosen as it offers a unique combination of advantages, as detailed in Chapter 4 of the ES (Document Reference 6.1.4):

'It centres upon a large and generally unused brownfield site with a broadly level terrain, large enough to accommodate a full resort development. It is close to the edge of London but outside of the metropolitan green belt. It lies only 1 km north of Ebbsfleet International Station, which offers high speed train connections to London St Pancras International station with a journey time as low as 17 minutes and services to and from continental Europe.

Strategic highway routes in the locality include the A2(T), which passes 3 km to the south of the peninsula and provides a connection to Junction 2 of the M25 motorway to the west and onwards into London. The Dartford Tunnels and Queen Elizabeth II Bridge crossings of the River Thames lie approximately 3 km to the west of the site.

The Swanscombe Peninsula does not contain any international or national wildlife or heritage designations, and it offers the potential to dovetail the resort development with significant local economic regeneration initiatives.'

12.232 Having determined the best location of the entertainment resort, the development layout for the site was appraised with consideration of a number of variables including (but not limited to) existing land use, land ownership, ground conditions, drainage, land contamination, local terrain, and transport requirements. From an ecological perspective, the development layout has been situated to avoid impacts on the most sensitive habitats where possible, and retains areas of habitat within Black Duck Marsh, Botany Marsh Local Wildlife Site and Broadness grassland, as well as areas of semi-natural habitat within Bamber Pit and through the Ebbsfleet Valley, and the majority of the existing coastal saltmarsh and inter-tidal mudflats around the edge of Swanscombe Peninsula. Furthermore, the land take from the Proposed Development mostly includes existing development or formerly developed land and landfill sites. In order to deliver a viable entertainment resort, the site needs to be large enough to accommodate the entertainment resort, including two theme park gates, attendant visitor attractions and amenities, hotels and transport facilities. Some habitat loss is therefore unavoidable.

12.233 Positioning the resort further west or north within the Swanscombe Peninsula, whilst avoiding impacts upon Botany Marsh West, the CTRL wetlands, and coastal floodplain grazing marsh (Priority habitat), and areas of Open Mosaic Habitat on Previously Developed Land (OMHPDL), would necessitate loss of further wetland habitats including

the reedbed (Priority habitat) within Black Duck Marsh and bring the development closer to the estuary front and coastal saltmarsh (Priority habitat) and is also constrained by the ultra high voltage connectors to the super pylon. Black Duck Marsh is considered to be 'functionally linked' to nearby statutory designated sites, including the Thames Estuary and Marshes Ramsar/Special Protection Area (SPA)/SSSI and the Medway Estuary and Marshes Ramsar/SPA/SSSI, as it supports various waterfowl species over winter. Furthermore, it also supports a diverse breeding bird assemblage not associated with the aforementioned designated sites, including small populations of breeding pochard, bearded tit and Cetti's warbler. On balance it is considered that situating the resort further west on the peninsula would have greater ecological impact.

12.234 The ecology mitigation strategy has been developed to mitigate and compensate for negative impacts remaining after application of the first 'avoid' stage of the mitigation hierarchy. This includes mitigation for impacts to the mosaic of habitats within the Kent Project Site, and associated fauna, as discussed further in this Chapter. Mitigation is not required at the Essex Project Site based on the absence of any impacts on terrestrial and freshwater ecological features.

Inherent Mitigation Measures

12.235 The Proposed Development includes a range of inherent mitigation measures which are illustrated within various design documents submitted along with the DCO application including the Illustrative Masterplan (Document Reference 6.3.3.1) and Landscape Masterplan enclosed within the Landscape Strategy (Document Reference 6.2.11.7), with details of management/enhancement provided within the Ecological Mitigation and Management Framework (Document Reference 6.2.12.3).

12.236 The inherent mitigation measures are provided below in respect of measures that will benefit biodiversity generally, and specifically in relation to key species/taxa:

General:

- Retention of areas of ecological value including Black Duck Marsh, Botany Marsh East LWS, Broadness grasslands and saltmarsh, the majority of Bamber Pit and areas of semi-natural habitat throughout the Ebbsfleet Valley;
- Retention of large areas of saltmarsh and inter-tidal mudflats around the edge of the Swanscombe Peninsula; and
- Provision of a large area managed primarily for biodiversity including Black Duck Marsh, Broadness grassland and Botany Marsh East LWS, comprising a mixture of reedbed, open grassland, scrub, ditches, ponds and wetland/SuDS features.

Bats:

- Retention and management of foraging and commuting habitats, as described by the general points above.

Dormouse:

- The retention of areas of suitable habitat within Broadness grassland, including existing woodland, tree and scrub habitats, and where possible within Bamber Pit;
- The retention and management of dense bramble and low growing scrub and trees along the north western boundaries of Black Duck Marsh, to maintain potential dispersal routes from Swanscombe Peninsula to the south-west;
- The retention and enhancement of a continuous belt of woodland habitat along the southern boundaries of Black Duck Marsh, connecting to additional green corridors proposed along the southern boundary adjacent to Tiltman Avenue, to ensure the continued functioning of existing dispersal routes to valuable off-site habitats to the south-west, including the woodland at the Swanscombe Heritage Park; and
- The retention, enhancement and creation of additional woodland habitat alongside the sensitive design of new landscaping around the peripheries of Botany Marsh, necessary to further promote habitat connectivity between Swanscombe Peninsula and habitats across the wider landscape to the south.

Water vole:

- The maintenance of habitat connectivity between Botany Marsh East, Broadness saltmarsh and Black Duck marsh through the inclusion of a chain of water courses and water bodies wrapping around the side of the Proposed Development.

Invertebrates:

- Retention (and enhancement where possible) of key areas of invertebrate habitat including within the eastern portion of Broadness Saltmarsh (including a specific zone of habitats around the base of the central electricity pylon which previous surveys have identified as being particularly important for thermophilic spider fauna open mosaic habitats), saltmarsh on the north west and north east fringes of Swanscombe peninsula, and Botany Marsh on the eastern side of Swanscombe peninsula.

Construction Impacts and Effects

12.237 In the absence of additional mitigation, the potential effects of the Proposed Development during the construction phase on the IEFs identified above are summarised below:

- Direct habitat loss, damage or degradation;
- Habitat fragmentation/loss of flight paths/dispersal routes;
- Habitat disturbance;
- Killing, injuring and disturbance of wild animals;
- Increased collision risk to birds and bats;
- Increased noise, vibration, visual and light disturbance;
- Changes in air quality including from dust, construction waste and pollutants, and exhaust emissions;
- Hydrological effects, including changes to water quality/quantity;
- Pollution/contamination incidents; and
- Spread of invasive species.

12.238 Further details, including which IEFs these potential effects relate to, are provided within **Table 12.10**.

12.239 The following should be read in conjunction with the Shadow Habitat Regulations Assessment (Document Reference 6.2.12.4), which provides further information on the assessment on potential effects upon European Sites.

12.240 In addition, an impact assessment specific to each species/species assemblage/taxa is also provided within the individual mitigation strategies enclosed as appendices to Appendix 12.3: Ecological Mitigation and Management Framework (Document Reference 6.2.12.3).

12.241 The assessment of potential effects during construction has been undertaken using information derived from other chapters within the Environmental Statement, notably Chapter 15: Noise and Vibration (Document reference 6.1.15), Chapter 16: Air Quality (Document reference 6.1.16), and Chapter 17: Water Resources and flood risk (Document reference 6.1.17).

Table 12.10: Construction effects on important ecological features without mitigation.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Designations				
Thames Estuary and Marshes SPA/Ramsar, and the component SSSIs including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI ¹⁹	International	<i>Potential impacts within the European/Ramsar Site itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from the Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	Temporary, reversible, minor magnitude and extent.	Not significant ²⁰
		Damage to habitats within the designated area used by cited bird species from changes in air quality , including from dust, construction waste and pollutants, exhaust emissions and increased river traffic.	Temporary, reversible, minor magnitude and extent.	Not significant
		Damage to habitats used by cited bird species within the designated area from introduction	Temporary, reversible, minor magnitude and extent.	Not significant ²¹

¹⁹ South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI are component SSSIs to the Thames Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

²⁰ By virtue of the distance between the Project Site and either the SPA/Ramsar/SSSI site, no significant effects are anticipated. Changes to sediment circulation patterns are likely to be minor given the open structure of the proposed new jetty at the Kent Project Site and of the extension of facilities at Tilbury. At this point no dredging is anticipated, Standard avoidance and management measures will reduce the likelihood of pollution events, and it is considered that any minor incidents that occur will be sufficiently dilute by the time they reach the TE and M SPA/Ramsar 2.8km downstream that they will not have the potential to cause LSE on the SPA/Ramsar.

²¹ Construction river traffic will be limited to that coming from Tilbury and from central London, and therefore the risk of INNS introductions in ballast water discharged by vessels is unlikely. Furthermore, the distance from regular shipping lanes to the SPA/Ramsar site is considered a limiting factor in the potential for INNS introductions. See Shadow Habitat Regulations Assessment (ES Appendix 12.3), Stage 1 Screening Matrix (Annex 4)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance	
(see Appendix 12.5)		or proliferation of Invasive Non-Native Species (INNS) , as a result of construction works (and in particular shipping/transport of materials).			
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant ²²	
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant ²³²⁴	
		<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>			
		Direct loss of/damage to functionally linked land on the Kent Project Site, potentially used by cited bird species , totalling a net loss of	Permanent, moderate magnitude and extent.	Significant negative at District level	

²² It is anticipated that no additional shipping movements would occur along the Thames past either site during construction or operation. Whilst construction phase movements will include additional barge movements between the Kent and Essex Project Sites, this is not anticipated to increase shipping traffic within or nearby to either the Thames Estuary and Marshes or Medway Estuary and Marshes SPA/Ramsar Sites. These additional barge movements will be accommodated within the normal and ongoing delivery pattern and will not represent an uplift on disturbance due to the combined and absolute limitations of berthing capacity and tidal restrictions at that site. See Shadow Habitat Regulations Assessment (ES Appendix 12.3), Stage 1 Screening Matrix

²³ The distance between the Project Site and the nearest part of the Thames Estuary and Marshes SPA (foreshore adjoining Eastcourt/Shorne Marshes) is approximately 3.3km and the nearest part of the Ramsar approximately 2.8km. At these distances significant impacts from lighting are not anticipated.

²⁴ In regards to noise, peak or mean (i.e. 24hr) noise in excess of 55dB is not predicted to be experienced outside of the DCO Order Limits for most construction or operational activities, with the exception of construction-phase jetty piling and dredging and pavement construction, for which values are not yet known. However, based on the information provided for more extensive works in association with Tilbury2, 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 (Tilbury2 ES Chapter 17 Table 17.30 [APP-031]). These data indicate that noise levels during construction would not be sufficient to elicit any behavioural responses in birds at over 2.8km (the nearest point of the Thames Estuary and Marshes SPA/Ramsar Site). See Shadow Habitat Regulations Assessment (ES Appendix 12.3), Stage 1 Screening Matrix

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.		
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	Temporary, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants ²⁵ .	Temporary, minor magnitude and extent.	Significant negative at District level ²⁶
		Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level

²⁵ No retained functionally linked habitats lie within 200m of an existing road. Effects due to increased construction traffic have therefore been screened out of this assessment.

²⁶ Given the proximity of construction work to retained functionally linked habitats (<50m in some cases, especially around Black Duck Marsh and along the estuary front), significant dust deposition is anticipated.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level ²⁷
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level
Medway Estuary and Marshes	International	<i>Potential impacts within the European/Ramsar Site itself:</i>		
		Damage to habitats within designated area used by the cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from the Project Site including construction waste and pollutants ; or from disruption of contaminated	Temporary, reversible, minor magnitude and extent.	Not significant ²⁹

²⁷ Although baseline ambient noise levels are high surrounding the site (50db-71db) and average within (44-48db), general construction activities at Gate 1 are expected to increase noise levels by 16-20db at NSR 22, although the effect is attenuated further from the source, with negligible increases at the SW edge of Black Duck Marsh and along the estuary foreshore.

²⁹ Given the distance between the Project Site and the mouth of the Medway estuary (33.4km) (i.e. the receptor pathway for pollutants), no likely significant effects are anticipated on the Medway Estuary and Marshes SPA/Ramsar/SSSI. See Shadow Habitat Regulations Assessment (ES Appendix 12.3), Stage 1 Screening Matrix (Annex 4)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
SPA/Ramsar/SSSI ²⁸		Thames sediments), with potential associated knock-on risk of bioaccumulation.		
		Damage to habitats within the designated area used by cited bird species from changes in air quality , including from dust, construction waste and pollutants, and exhaust emissions .	Temporary, reversible, minor magnitude and extent.	Not significant
		Damage to habitats used by cited bird species within the designated area from introduction or proliferation of INNS , as a result of construction works (and in particular shipping/transport of materials).	Temporary, reversible, minor magnitude and extent.	Not significant
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant ^{30 31}

²⁸ Medway Estuary and Marshes SSSI is a component SSSI to the Medway Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

³⁰ The distance between the Project Site and the nearest part of the Medway Estuary and Marshes SPA is approximately 13.1km. At these distances significant impacts from lighting are not anticipated.

³¹ In regards to noise, peak or mean (i.e. 24hr) noise in excess of 55dB is not predicted to be experienced outside of the DCO Order Limits for most construction or operational activities , with the exception of construction-phase jetty piling and dredging and pavement construction, for which values are not yet known. However, based on the degree of geographical separation between the Project Site and the Medway Estuary and Marshes SPA/Ramsar/SSSI significant effects are not anticipated at this distance

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>		
		Direct loss of/damage to functionally linked land on the Kent Project Site, potentially used by cited bird species , totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Permanent, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	Temporary, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species from	Temporary, minor magnitude and extent.	Significant negative at District level ³³

³³ Given the proximity of construction work to retained functionally linked habitats (<50m in some cases, especially around Black Duck Marsh and along the estuary front), significant dust deposition is anticipated.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		changes in air quality including from dust, construction waste and pollutants ³² .		
		Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level ³⁴
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level

³² No retained functionally linked habitats lie within 200m of an existing road. Effects due to increased construction traffic have therefore been screened out of this assessment.

³⁴ Although baseline ambient noise levels are high surrounding the site (50db-71db) and average within (44-48db), general construction activities at Gate 1 are expected to increase noise levels by 16-20db at NSR 22, although the effect is attenuated further from the source, with negligible increases at the SW edge of Black Duck Marsh and along the estuary foreshore.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
North Downs Woodland SAC, and the component SSSI Wouldham to Detling Escarpment SSSI ³⁵	International	Construction traffic generated air quality impacts – due to potential increases in vehicle movements along the A229 and A259 trunk roads which lie within 200m of areas of North Downs Woodland SAC and link the M2/A2 corridor and the M20.	Temporary, minor magnitude and extent.	Not significant ³⁶
Swanscombe Peninsula SSSI	National	Overall reduction in SSSI area, and fragmentation by the Resort (109.6ha lost, i.e. 42.2%)	Permanent, major magnitude and extent	Significant negative at National level
		Damage to habitats within the designated area from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions.	Temporary, reversible, major magnitude and extent. Likely to be major magnitude due to proximity of construction	Significant negative at National level
		<i>Special feature of interest - populations of rare plants³⁷:</i>		

³⁵ Wouldham to Detling Escarpment SSSI is a component SSSI to the North Downs Woodland SAC, with overlapping reasons for designation. Potential impacts to the SAC as described are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

³⁶ As set out with Air Quality Assessment (ES Chapter 16 Air Quality; Document Reference 6.1.16), for construction the SAC is not within 350m of the site boundary and/or within 50m of the kerb of a road used by construction traffic and any impacts can be ruled as insignificant.

³⁷ Includes only those rare plant populations listed as a reason for notification of the Swanscombe Peninsula SSSI, including divided sedge (*Carex divisa*), yellow vetchling (*Lathyrus aphaca*), slender hare's-ear (*Bupleurum tenuissimum*), Bithynian vetch (*Vicia bithynica*) and round-leaved wintergreen (*Pyrola rotundifolia subsp. maritima*). A separate assessment of potentially significant effects upon 'non-SSSI' rare plants is provided under the 'rare plants' IEF.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality	Temporary, moderate magnitude and extent.	Significant negative at National level
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, major magnitude and extent.	Significant negative at National level
		Damage to supporting habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at National level
		Habitat fragmentation.	Permanent, moderate magnitude and extent.	Significant negative at National level
		Disturbance (lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at National level
Darenth Woods SSSI	National	<p>Direct loss of habitat – not applicable.</p> <p>The Proposed Development will result in no direct land take from within the SSSI. Whilst the DCO boundary previously included the ancient woodland parcels between the A2(T) and A296 slip roads, these have since been removed and will not be affected by The London Resort proposals, which will be limited to minor highway works in this area such as road markings and signage. As a point of clarity, a small number of individual trees will be lost on the edge of 'The Thrift' Ancient Woodland on the southern boundary of the A2(T) and the slip road as a result of the separate A2(T) Bean and</p>	N/A	N/A

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Ebbsfleet Junction improvement works, which were permitted in May 2020.		
		Damage to habitats within the designated area from changes in air quality , including from dust, construction waste and pollutants, and exhaust emissions .	Temporary, reversible, minor magnitude and extent.	Significant at the District level
		Disturbance (noise and lighting) associated with increased construction traffic along A2(T).	Temporary, reversible, minor magnitude and extent.	Not significant ³⁸
Shorne and Ashenbank Woods SSSI	National	Disturbance (noise and lighting) associated with increased construction traffic along A2(T).	Temporary, reversible, minor magnitude and extent.	Not significant ³⁹
Inner Thames Marshes SSSI	National	<i>Potential impacts within the SSSI itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from the Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	Temporary, reversible, minor magnitude and extent.	Not significant
		Damage to habitats within the designated area used by cited bird species from changes in air	Temporary, reversible, minor magnitude and extent.	Not significant

³⁸ Construction traffic is predicted to create an additional 0-0.1db of road noise along the A2(T), as modelled and shown within the Construction Noise Assessment (Document Reference Part 6.2, Chapter 15.3). General construction noise levels are not expected to change significantly at NSR 5, which is significantly closer to construction activities (<500m) and situated between the noise source and SSSI.

³⁹ Construction traffic is predicted to create an additional 0-0.1db of road noise along the A2(T), as modelled and shown within the Construction Noise Assessment (Document Reference Part 6.2, Chapter 15.3). General construction noise levels are not expected to change significantly at NSR 5, which is significantly closer to construction activities (<500m) and situated between the noise source and SSSI.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		quality , including from dust, construction waste and pollutants, and exhaust emissions.		
		Damage to habitats used by cited bird species within the designated area from introduction or proliferation of INNS , as a result of construction works (and in particular shipping/transport of materials).	Temporary, reversible, minor magnitude and extent.	Not significant
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant
		<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>		
		Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by bird species , totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Permanent, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat	Temporary, moderate magnitude and extent	Significant negative at District level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.		
		Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants ⁴⁰ .	Temporary, minor magnitude and extent.	Significant negative at District level ⁴¹
		Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level

⁴⁰ No retained functionally linked habitats lie within 200m of an existing road. Effects due to increased construction traffic have therefore been screened out of this assessment.

⁴¹ Given the proximity of construction work to retained functionally linked habitats (<50m in some cases, especially around Black Duck Marsh and along the estuary front), significant dust deposition is anticipated.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited species potentially using functionally linked habitats.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level ⁴²
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
West Thurrock Lagoon and Marshes SSSI	National	<i>Potential impacts within the SSSI itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (either from surface or groundwater discharges from the Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	Temporary, reversible, minor magnitude and extent.	Not significant
		Damage to habitats within the designated area used by cited bird species from changes in air quality , including from dust, construction waste and pollutants, and exhaust emissions	Temporary, reversible, minor magnitude and extent.	Not significant

⁴² It is likely that the Project Site is functionally linked to the Inner Thames Marshes SSSI. Although baseline ambient noise levels are high surrounding the site (50db-71db) and average within (44-48db), general construction activities at Gate 1 are expected to increase noise levels by 16-20db at NSR 22, although the effect is attenuated further from the source, with negligible increases at the SW edge of Black Duck Marsh and along the estuary foreshore.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to habitats used by cited bird species within the designated area from introduction or proliferation of INNS , as a result of construction works (and in particular shipping/transport of materials).	Temporary, reversible, minor magnitude and extent.	Not significant
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Temporary, reversible, minor magnitude and extent.	Not significant ⁴³
<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>				
		Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by cited bird species , totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Permanent, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage	Temporary, moderate magnitude and extent.	Significant negative at District level

⁴³ Noise levels further from the source into the Thames Estuary and across to Thurrock Lagoon and Marshes SSSI will attenuate are expected to be as low as 35-40db (worst case 45db) on the north bank of the Thames.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		and infill of the CTRL wetland, swamp/wetland habitat along the east/south-east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.		
		Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants ⁴⁴ .	Temporary, minor magnitude and extent.	Significant negative at District level ⁴⁵
		Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level

⁴⁴ No retained functionally linked habitats lie within 200m of an existing road. Effects due to increased construction traffic have therefore been screened out of this assessment.

⁴⁵ Given the proximity of construction work to retained functionally linked habitats (<50m in some cases, especially around Black Duck Marsh and along the estuary front), significant dust deposition is anticipated.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited species potentially using functionally linked habitats.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level ⁴⁶
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
Cobham Woods SSSI	National	Disturbance (noise and lighting) associated with increased construction traffic along A2(T).	Temporary, reversible, minor magnitude and extent.	Not significant ⁴⁷
Great Crabbles Wood SSSI	National	Disturbance (noise and lighting) associated with increased construction traffic along A2(T).	Temporary, reversible, minor magnitude and extent.	Not significant ⁴⁸
Botany Marshes LWS	County	Damage to habitats from changes in air quality , including from dust, construction waste and pollutants.	Temporary, major magnitude and extent.	Significant at Local level

⁴⁶ It is likely that the Project Site is functionally linked to the Inner Thames Marshes SSSI. Although baseline ambient noise levels are high surrounding the site (50db-71db) and average within (44-48db), general construction activities at Gate 1 are expected to increase noise levels by 16-20db at NSR 22, although the effect is attenuated further from the source, with negligible increases at the SW edge of Black Duck Marsh and along the estuary foreshore

⁴⁷ Construction traffic is predicted to create an additional 0-0.1db of road noise along the A2(T), as modelled and shown within the Construction Noise Assessment (Document Reference Part 6.2, Chapter 15.3). General construction noise levels are not expected to change significantly at NSR 5, which is significantly closer to construction activities (<500m) and situated between the noise source and SSSI.

⁴⁸ Construction traffic is predicted to create an additional 0-0.1db of road noise along the A2(T), as modelled and shown within the Construction Noise Assessment (Document Reference Part 6.2, Chapter 15.3). General construction noise levels are not expected to change significantly at NSR 5, which is significantly closer to construction activities (<500m) and situated between the noise source and SSSI.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to habitats from changes to hydrological regime (through destruction of adjoining wetland/grazing marsh), and changes in water quality/quantity.	Permanent, major magnitude and extent.	Significant at Local level
		Damage to habitats from adjacent construction works and deposition of construction materials.	Temporary, moderate magnitude and extent.	Significant at Local level
		Disturbance (noise and lighting) associated with construction activities, giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.	Temporary, minor magnitude and extent.	Significant at Local level ⁴⁹
Ebbsfleet Marshes, Northfleet LWS	County	Direct loss of/damage to habitat through Station Quarter South .	Permanent, moderate magnitude and extent.	Significant at District level
		Damage to habitats from changes in air quality, including from dust, construction waste and pollutants.	Temporary, moderate magnitude and extent.	Significant at Local level
		Damage to habitats from changes to hydrological regime (through destruction of habitat within flood zone of River Ebbsfleet), and changes in water quality/quantity.	Temporary, moderate magnitude and extent.	Significant at Local level
		Damage to habitats from adjacent construction works and deposition of construction materials.	Temporary, moderate magnitude and extent.	Significant at Local level
		Disturbance (noise and lighting) associated with construction activities, giving rise to	Temporary, moderate magnitude and extent.	Significant at Local level ⁵⁰

⁴⁹ Noise levels are expected to reach between 54db and 64db at Botany Marshes LWS, however, minor adverse effects are anticipated because baseline noise and vibration levels from HGV and industrial operations within the Manor Way business park and CEMEX concrete works facility are already significant.

⁵⁰ Noise levels not expected to exceed 59db outside of construction area (within retained habitat), which is not considered significant over the baseline noise levels, which are already significant.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		displacement, behavioural changes or physiological stress to wildlife species within the designated area.		
Alkerden Lane Pit LWS	County	Direct loss of habitat – not applicable. The Proposed Development will result in no direct land take from within the LWS.	N/A	N/A
		Loss of part of plant and invertebrate meta-population through loss of habitat in the Kent Project Site.	Permanent, minor magnitude and extent.	Significant at Local level
		Damage to habitats from changes in air quality , including from dust, construction waste and pollutants .	Temporary, major magnitude and extent.	Significant at Local level
Disused Hospital Grounds, Mabledon LWS	County	Damage to habitats from changes in air quality , including from dust, construction waste and pollutants .	Temporary, major magnitude and extent.	Not significant ⁵¹
Tilbury Marshes LWS	County	Direct loss of habitat – not applicable. The Proposed Development will result in no direct land take from within the LWS.	N/A	N/A
		Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by bird species , totalling a net loss of 15.49ha, including 14.55ha of coastal and	Permanent, moderate magnitude and extent.	

⁵¹ In accordance with IAQM guidance, an assessment of construction dust will normally be required where there is an ‘ecological receptor’ within 50m of the boundary of the site; or 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance. The Disused Hospital Grounds LWS is located 1.3km south-west of the Kent Project Site. Chapter 16: Air Quality (Document reference: 6.1.16) confirms that “...80-90% of construction materials will be transported by river.” The chapter confirms that “The impact from construction traffic emissions is predicted to be negligible at all modelled receptor locations”

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.		
		Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level ⁵²
		Disturbance (human movement or activity), to bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
Habitats/Flora				
Populations of nationally scarce plants	National	N.B. Assessment of potential effects upon scarce plants included under Swanscombe Peninsula SSSI		

⁵² Noise levels further from the source into the Thames Estuary and across to Tilbury during general construction will attenuate are expected to be as low as 35-40db (worst case 45db) on the north bank of the Thames. Additional noise from construction work at Tilbury is expected to be negligible as the existing car park and buildings will be used, with only the addition of a floating jetty.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Broad leaved Semi Natural Woodland	Local	Direct loss of habitat from woodland south of Black Duck Marsh – 3.84ha lost from a total of 21.37ha (18% of the existing total).	Permanent, major magnitude and extent.	Significant at Local level
		Damage to habitat from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant at Local level
Ancient woodland	County	Damage to habitats within the designated area from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions.	Temporary, reversible, minor magnitude and extent.	Significant at the District level
Scrub	Local	Direct loss of habitat , a total of 34.79ha lost (41.71% of the existing total)	Permanent, major magnitude and extent.	Significant at Local level
		Damage to habitats from adjacent construction works and deposition of construction materials in Root Protection Area (RPA).	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitat from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
Semi-improved grassland	Local to District	Direct loss of habitat , 36.19ha lost (44.79% of the existing total)	Permanent, major magnitude and extent.	Significant at Local level
		Damage to habitats from adjacent construction works and deposition of construction materials.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitat from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Coastal/flood plain grazing marsh	District	Direct loss of habitat , 13.74ha lost (100% of the existing total). All CFGM is also included under the Floodplain Wetland Mosaic grouping, within the biodiversity impact calculations (Document reference 6.2, Appendix 12.2).	Permanent, major magnitude and extent.	Significant at District level
Open mosaic on previously developed land	District	Direct loss of habitat , 39.83ha lost (63.7% of the existing total), includes a range of individual habitat components including areas of bare ground, ephemeral vegetation, open grassland and patches of scrub.	Permanent, major magnitude and extent.	Significant at District level
		Damage to habitats from adjacent construction works and deposition of construction materials.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitat from construction dust, waste and pollutants .	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
Waterbodies (ponds, standing water and ditch network)	District	Direct loss of habitat , 2.30ha of waterbodies lost (50.79% of the existing total) and 4.7km of ditches (50.98% of the existing total). 0.22ha of lost waterbodies are also included under the Floodplain Wetland Mosaic grouping, within the biodiversity impact calculations (Document reference 6.2, Appendix 12.2).	Permanent, major magnitude and extent.	Significant at District level
		Damage to habitats from changes to hydrological regime (through destruction of surrounding habitats), and changes in water quality/quantity .	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to habitat from construction dust, waste and pollutants.	Temporary, reversible, minor magnitude and extent.	Significant at Local level
		Damage to habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
Swamp (reedbed)	County	Direct loss of habitat from 13.62ha lost (41.75% of total area). 2.84ha of reedbed is also included under the OMHPDL grouping and 0.88ha under Floodplain Wetland Mosaic, within the biodiversity impact calculations (Document reference 6.2, Appendix 12.2).	Permanent, major magnitude and extent.	Significant at county level
		Damage to habitats from adjacent construction works and deposition of construction materials.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitats from changes to hydrological regime (through destruction of surrounding habitats), and changes in water quality/quantity .	Temporary, moderate magnitude and extent.	Significant at Local level
		Damage to habitat from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
River Ebbsfleet	Local	Direct loss of connected floodplain habitat within Ebbsfleet Valley, such as waterbodies and semi-improved grassland.	Permanent, moderate magnitude and extent.	Significant at Local level
		Damage to habitat from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant at Local level
		Damage to habitats from changes to hydrological regime (through destruction of	Temporary, moderate magnitude and extent.	Significant at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		surrounding habitats), and changes in water quality/quantity.		
		Damage to habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
Species				
Wintering Waterfowl and Wading Bird Assemblage	International	N.B. Assessment of potential habitat loss and disturbance effects upon wintering waterfowl and wading bird assemblage included under SPA/Ramsar Sites		
		Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at District level
Wintering terrestrial bird assemblage	County	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at District level
		Direct habitat loss – loss of suitable habitat such as scrub, grassland, reedbed and woodland, as detailed above.	Permanent, moderate magnitude and extent.	Significant negative at District level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, moderate magnitude and extent.	Significant negative at District level
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at District level
		Damage to habitats from introduction or proliferation of INNS – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Habitat fragmentation, loss of flight paths and dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at District level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (from shipping/ferry movements) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (noise and lighting) – as described above in relation to impacts on habitats functionally linked to SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level
		Disturbance (human movement or activity) – as described above in relation to impacts on habitats functionally linked to SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level
Breeding Bird Assemblage	National	N.B. Assessment of potential effects upon breeding bird assemblage included under Swanscombe Peninsula SSSI		
Bat Assemblage	District - County	Direct killing, injury or harm to individuals – during demolition of buildings with bat roost potential and trees with bat roost potential.	Permanent, major magnitude and extent.	Significant negative at Local level
		Direct loss of potential roosting habitat – including trees, buildings and structures with bat roost potential. Tunnels TU/016 (negligible/low potential with possible pipistrelle hibernation roost) and TU/018 (low potential and winter bat roost uncertain) will be used for access between the transport interchange and staff accommodation.	Permanent, major magnitude and extent.	Significant negative at Local-District level
		Direct loss of foraging, commuting and dispersal habitats - loss of suitable foraging habitat such as scrub, grassland, reedbed and	Permanent, moderate magnitude and extent.	Significant negative at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		woodland, as detailed above, including potential winter foraging habitat.		
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at Local level
		Habitat fragmentation, loss of flight paths and dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Disturbance (noise and lighting) – including on retained roosts, foraging areas and commuting routes.	Temporary, reversible, moderate magnitude and extent.	Significant negative at Local level
Dormouse	District	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at District level
		Direct habitat loss – loss of suitable habitat such as scrub and woodland, as detailed above, and within the Dormouse Mitigation Strategy within the Ecological Mitigation and Management Framework (Document Reference 6.2.12.3).	Permanent, moderate magnitude and extent.	Significant negative at District level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at District level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at District level
		Damage to supporting habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at District level
		Habitat fragmentation and loss of dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at District level
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at District level
Otter	Local	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at Local level
		Direct habitat loss – loss of suitable habitat such as reedbed and waterbodies, as detailed above.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from construction dust, waste and pollutants	Temporary, minor magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at Local level
		Habitat fragmentation and loss of dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Water Vole	Local to district	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at Local level
		Direct habitat loss – including 6.1km of suitable ditches and bankside habitat and reedbed (as detailed above).	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at Local level
		Habitat fragmentation and loss of dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at Local level
Harvest Mouse	Local	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at Local level
		Direct habitat loss – loss of suitable habitat such as reedbed, semi-improved grassland, scrub and tall ruderal, as detailed above.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at Local level
		Habitat fragmentation and loss of dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at Local level
Amphibian assemblage	Local to district	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent.	Significant negative at Local level
		Direct habitat loss – loss of suitable habitat such as reedbed and waterbodies, as detailed above.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from introduction or proliferation of INNS.	Temporary, reversible, minor magnitude and extent.	Significant negative at Local level
		Habitat fragmentation and loss of dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Reptile assemblage	District	Direct killing, injury or harm to individuals – during vegetation clearance.	Permanent, major magnitude and extent	Significant negative at Local level
		Direct habitat loss – loss of suitable habitat such as semi-improved grassland, reedbed and tall ruderal, as detailed above.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Temporary, moderate magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from construction dust, waste and pollutants.	Temporary, minor magnitude and extent.	Significant negative at Local level
		Damage to supporting habitats from introduction or proliferation of INNS .	Temporary, reversible, minor magnitude and extent.	Significant negative at Local level
		Habitat fragmentation and loss of dispersal routes.	Permanent, moderate magnitude and extent.	Significant negative at Local level
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Temporary, reversible, moderate magnitude and extent.	Significant negative at Local level
Invertebrate assemblage	National	N.B. Assessment of potential effects upon invertebrate assemblages included under Swanscombe Peninsula SSSI		

Operational Impacts and Effects

12.242 Without mitigation, the potential effects of the proposed development on the IEFs identified above during the operational phase could include:

- Habitat fragmentation/loss of flight paths/dispersal routes;
- Increased lighting, noise and traffic leading to disturbance of species within retained and newly created habitats;
- Increased collision risk to birds and bats;
- Hydrological effects, including changes to water quality/quantity;
- Damage or degradation to habitats and disturbance of wildlife through increased recreational pressure and trampling; and
- Potential positive effects/benefits through provision of habitats with greater biodiversity value than those currently present, and implementation of appropriate management of the retained and created habitats to maximise their biodiversity potential.

12.243 Further details, including which IEFs these potential effects relate to, are provided within **Table 12.11**.

12.244 In addition, further information on potential effects upon European Sites is provided within Appendix 12.4: *Shadow Habitat Regulations Assessment* (Document Reference 6.2.12.4).

12.245 An impact assessment specific to each species/species assemblage/taxa is also provided within the individual mitigation strategies enclosed within Appendix 12.3: *Ecological Mitigation and Management Framework* (Document Reference 6.2.12.3).

12.246 The assessment of potential effects during operation has been undertaken using information derived from other chapters within the Environmental Statement, notably Chapter 15: Noise and Vibration (Document reference 6.1.15), Chapter 16: Air Quality (Document reference 6.1.16), and Chapter 17: Water Resources and flood risk (Document reference 6.1.17). An assessment of the potential effects of climate change on ecological receptors, using Chapter 20: Greenhouse gas and climate change (Document reference: 6.1.20) is provided towards the end of this chapter.

Air Quality

12.247 To inform the assessment of potential ecological effects arising from changes in air quality, as predicted within Chapter 16: Air Quality (Document reference 6.1.16), transect data

provided in Figures 16.20 – 16.24 have been used to calculate the extent of nitrogen deposition at those ecological receptors included in the air quality assessment based on the area predicted to exceed 1% of the minimum nutrient nitrogen critical load and nitrous oxide critical level). The results in respect of Darenth Wood SSSI are presented in **Tables 12.12 and 12.13**, and in respect of local sites (ancient woodland and LWSs) in **Tables 12.14 and 12.15**.

Table 12.11: Operational Effects on Important Ecological Features without Mitigation

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Designations				
Thames Estuary and Marshes SPA/Ramsar, and the component SSSIs including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI ⁵³	International	<i>Potential impacts within the European/Ramsar Site itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Not significant
		Damage to habitats within the designated area used by cited bird species and/or changes in the food supply of cited species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant ⁵⁴
		Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant

⁵³ South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI are component SSSIs to the Thames Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also

⁵⁴ With reference to the Air Quality Assessment in Chapter 16: Air Quality (Document reference 6.2.16), which is based on a traffic model which incorporates traffic data from relevant cumulative schemes, impacts upon the Thames Estuary and Marshes SPA/Ramsar/SSSI can be ruled insignificant. The designated site is located >200m from the roadside of roads predicted to experience an increase of >1000 AADT. The designated site is within 10km of the energy centre point source, however, the predicted

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁵⁵
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at National level
		<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>		
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant

impact is less than 1% of the relevant critical loads and critical level and can therefore be ruled insignificant. Furthermore, the average N disposition at the SPA/SSSI remains below the critical level for supporting saltmarsh habitats (APIS, 2021) with atmospheric N of low importance for these systems.

⁵⁵ Noise levels generated within the site during operation by traffic and visitors/rides are not anticipated to exceed 49dB at any offshore location. Peaks associated with the resort’s operation can therefore be ruled out as having the potential to give rise to significant effect on either the SPA/Ramsar/SSSI

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level</p>
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level⁵⁶</p>
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Permanent, irreversible, moderate magnitude and extent.</p>	<p>Significant negative at District level</p>

⁵⁶ The most significant noise source during operation will be loudspeaker announcements, which are expected to produce up to 80db at the estuary front, dropping to c.50-59db throughout Black Duck Marsh. However, these announcements will be sporadic and ambient noise levels are expected to be around 40-49db within Black Duck Marsh and along the estuary foreshore.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Medway Estuary and Marshes SPA/Ramsar/SSSI ⁵⁷	International	<i>Potential impacts within the European/Ramsar Site itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Not significant
		Damage to habitats within the designated area used by cited bird species and/or changes in the food supply of cited species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant ⁵⁸
		Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant

⁵⁷ Medway Estuary and Marshes SSSI is a component SSSI to the Medway Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also

⁵⁸ With reference to the Air Quality Assessment in Chapter 16: Air Quality (Document reference 6.2.16), which is based on a traffic model which incorporates traffic data from relevant cumulative schemes, impacts upon the Medway Estuary and Marshes SPA/Ramsar/SSSI can be ruled insignificant. The designated site is located >200m from the roadside of roads predicted to experience an increase of >1000 AADT. The designated site is not within 10km of the energy centre point source. Average N disposition remains below the critical level for supporting saltmarsh habitats (APIS, 2021) with atmospheric N of low importance for these systems.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁵⁹
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Permanent, reversible-irreversible, minor magnitude and extent.	Not significant
<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>				
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species and/or changes in the food supply of cited species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant

⁵⁹ Noise levels generated within the site during operation by traffic and visitors/rides are not anticipated to exceed 49dB at any offshore location. Peaks associated with the resort’s operation can therefore be ruled out as having the potential to give rise to significant effect on either the SPA/Ramsar/SSSI

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level</p>
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level⁶⁰</p>
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Permanent, irreversible, moderate magnitude and extent.</p>	<p>Significant negative at District level</p>

⁶⁰ The most significant noise source during operation will be loudspeaker announcements, which are expected to produce up to 80db at the estuary front, dropping to c.50-59db throughout Black Duck Marsh. However, these announcements will be sporadic and ambient noise levels are expected to be around 40-49db within Black Duck Marsh and along the estuary foreshore.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
North Downs Woodland SAC, and the component SSSI Wouldham to Detling Escarpment SSSI ⁶¹	International	Traffic generated air quality impacts resulting in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity. For the ambient NOx critical level, the critical level is predicted to be exceeded at North Downs Woodland, both with and without the development in place.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁶²
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Permanent, irreversible,, minor magnitude and extent.	Not significant
Swanscombe Peninsula SSSI	National	Damage to habitats within the designated area from traffic generated air quality impacts .	Permanent, irreversible, major magnitude and extent. Likely to be major due to proximity of SSSI to affected road network and energy point source	Significant negative at National level

⁶¹ Wouldham to Detling Escarpment SSSI is a component SSSI to the North Downs Woodland SAC, with overlapping reasons for designation. Potential impacts to the SAC are therefore considered to adequately cover the designated interest features of the SSSI also

⁶² Circa 0.007% of the SAC land area lies within 200m of the A229, whilst 1.2% of SAC land area lies within 200m of the A249. Given the small extent of habitat located with the potential Zol of either main road, the potential for significant negative effects upon the favourable conservation status of the SAC is considered unlikely, whilst those SSSI units (units 26 and 15) in proximity to the A229 and A429 remain in favourable condition. As such, potential impacts arising are considered to be imperceptible and ruled insignificant. With reference to the Air Quality Assessment in Chapter 16: Air Quality (Document reference 6.2.16), which is based on a traffic model which incorporates traffic data from relevant cumulative schemes, the SAC is over 10km from the energy centre point source.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<i>Special feature of interest - populations of rare plants⁶³:</i>		
		Damage to individual plants/supporting habitat, and part of plant meta-population, through increased recreational use, potentially resulting in trampling, littering, dog fouling, unauthorised camping/campfires/barbecues.	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at National level
		Damage to individual plants/supporting habitat, and part of plant meta-population, through inappropriate land management practices.	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at National level
		Damage to retained plants/population from changes to hydrological regime and changes in water quality/quantity.	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at National level
		<i>Special feature of interest - breeding bird assemblages:</i>		
		Damage to on-site habitats potentially used by birds from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at National level

⁶³ Includes only those rare plant populations listed as a reason for notification of the Swanscombe Peninsula SSSI, including divided sedge (*Carex divisa*), yellow vetchling (*Lathyrus aphaca*), slender hare's-ear (*Bupleurum tenuissimum*), Bithynian vetch (*Vicia bithynica*) and round-leaved wintergreen (*Pyrola rotundifolia subsp. maritima*). A separate assessment of potentially significant effects upon 'non-SSSI' rare plants is provided under the 'rare plants' IEF.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise⁶⁴ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bird species using the on-site habitats.	Permanent, irreversible, moderate magnitude and extent.	Significant negative at National level
		Disturbance (human movement or activity) , to bird species, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.	Permanent, irreversible, moderate magnitude and extent.	Significant negative at National level
		Increased collision risk , with potential for killing/injuring birds, as a result of new tall structures in the local environment.	Permanent, irreversible, minor magnitude and extent.	Not significant
		<i>Special feature of interest - invertebrate assemblages:</i>		
		Damage to on-site habitats potentially used by invertebrates from changes to hydrology ; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at National level

⁶⁴ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities.	Permanent, irreversible, minor magnitude and extent.	Significant negative at National level

Dareath Woods SSSI	National	<p>Damage to habitats within the designated area from traffic generated air quality impacts resulting in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity.</p> <p>Chapter 16: Air Quality (Document reference 6.1.16) confirms that the impact of acid deposition can be ruled insignificant.</p> <p>In terms of the critical load for nutrient nitrogen deposition, the contribution from the Proposed Development is predicted to exceed 1% of the minimum critical load at Dareath Wood SSSI. Transect data provided in Figure 16.23 have been used to calculate the extent of nitrogen deposition based on the area predicted to exceed 1% of the minimum nutrient nitrogen critical load. A breakdown of the areas to be affected, with reference to the SSSI units, is provided in full in Table 12.22. In summary, the area predicted to exceed 1% of the minimum nutrient nitrogen critical load is 8.01ha (6.52% of total site area). Three of the nine SSSI units will be unaffected. At this level, and based on the nature of the habitats present, a significant ecological effect on the site's integrity is considered unlikely.</p>	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant at the local level
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Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		For the ambient NOx critical level, the critical level is predicted to be exceeded at Darenth Wood SSSI, both with and without the development in place. The contribution from the proposed development is predicted to exceed 1% of the critical level across 26.5ha; of the SSSI accounting 21.72% of total site area.		
		Disturbance (noise and lighting) associated with traffic, operation of the resort rides and attractions, and entertainment facilities.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁶⁵
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Permanent, irreversible, minor magnitude and extent.	Not significant
Inner Thames Marshes SSSI	National	<i>Potential impacts within the SSSI itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Not significant

⁶⁵ Ambient noise level increases along the A2(t) are predicted to be <1db. Noise generated by rides and other facilities will be sub-significant within 300m of the DCO Order Limits.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Damage to habitats within the designated area used by cited bird species and/or changes in the food supply of cited species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant ⁶⁶
		Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁶⁷
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Permanent, irreversible, minor magnitude and extent.	Not significant

⁶⁶ The SSSI is over 2km from the energy centre point source and over 200m from the roadside of any roads predicted to experience an increase of >1000 AADT, and the impact can be ruled insignificant.

⁶⁷ Noise levels generated within the site during operation by traffic and visitors/rides are not anticipated to exceed 49dB at any offshore location. Peaks associated with the resort’s operation can therefore be ruled out as having the potential to give rise to significant effect on the SSSI

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>		
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at District level
		Damage to functionally linked habitats potentially used by cited bird species and/or changes in the food supply of cited species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant
		Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Significant negative at District level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.	Permanent, irreversible, moderate magnitude and extent.	Significant negative at District level
West Thurrock Lagoon and Marshes SSSI	National	<i>Potential impacts within the SSSI itself:</i>		
		Damage to habitats within designated area used by cited bird species from changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Not significant
		Damage to habitats within the designated area used by cited bird species and/or changes in the food supply of cited species from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant ⁶⁸

⁶⁸ The SSSI is over 2km from the energy centre point source and over 200m from the roadside of any roads predicted to experience an increase of >1000 AADT, and the impact can be ruled insignificant. Average N disposition remains below the critical level for supporting saltmarsh habitats (APIS, 2021) with atmospheric N of low importance for these systems.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁶⁹
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Permanent, irreversible, minor magnitude and extent.	Not significant
		<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>		
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant negative at District level

⁶⁹ Noise levels generated within the site during operation by traffic and visitors/rides are not anticipated to exceed 49dB at any offshore location. Peaks associated with the resort’s operation can therefore be ruled out as having the potential to give rise to significant effect on the SSSI

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Damage to functionally linked habitats potentially used by cited bird species and/or changes in the food supply of cited species from changes in air quality, including from exhaust emissions.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Not significant</p>
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level</p>
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level</p>
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.</p>	<p>Permanent, irreversible, moderate magnitude and extent.</p>	<p>Significant negative at District level</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Shorne and Ashenbank Woods SSSI	National	Damage to habitats within the designated area from traffic generated air quality impacts . Increased disposition of N likely to result in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity with such impacts likely occurring across circa 0.2% of total SSSI area is located within 200m of the A2 whilst the woodland is reported to be in favourable or unfavourable recovering condition.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁷⁰
Cobham Woods SSSI	National	Damage to habitats within the designated area from traffic generated air quality impacts . Increased disposition of N likely to result in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity with such impacts likely occurring across circa 5.7% of total SSSI area is located within 200m of the M2 motorway. Total area of impact is, however, reduced given N sensitive woodland habitat is only present across a proportion of this area.	Permanent, irreversible, minor magnitude and extent.	Not significant ⁷¹

⁷⁰ Given the relatively small area of qualifying woodland habitat within 200m of the A2, combined with the predominantly favourable condition of woodland habitat, significant negative effects upon the integrity of this SSSI and its qualifying features are considered unlikely.

⁷¹ Given the relatively small area of qualifying woodland habitat within 200m of the M2 motorway, combined with its favourable condition, significant negative effects upon the integrity of this SSSI and its qualifying features are considered unlikely.

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Great Crabbles Wood SSSI	National	Damage to habitats within the designated area from traffic generated air quality impacts . Increased disposition of N likely to result in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity with such impacts likely occurring across circa 13.6% of total SSSI area is located within 200m of the A289 whilst the woodland is reported to be in unfavourable recovering condition. Total area of impact is, however, reduced given N sensitive woodland habitat is only present across a proportion of this area.	Permanent, irreversible, minor magnitude and extent.	Significant at the local level
Botany Marshes LWS	County	Damage to habitats from changes in air quality , including from exhaust emissions .	Permanent, irreversible, minor magnitude and extent.	Not significant
		Damage to habitats from changes to hydrological regime , and changes in water quality/quantity .	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant at Local level
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, potentially giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.	Permanent, irreversible, moderate magnitude and extent.	Significant at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff) and potential increased recreational use of Swanscombe Peninsula from members of the general public.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant at Local level</p>

<p>Ebbsfleet Marshes, Northfleet LWS</p>	<p>County</p>	<p>Damage to habitats within the designated area from traffic generated air quality impacts. Increased disposition of N likely to result in nutrient enrichment and acidification of woodland habitat with subsequent changes in structure and diversity. Open water and eutrophic swamp are, however, less sensitive to atmospheric N inputs such that significant effects are unlikely.</p> <p>Chapter 16: Air Quality (Document reference 6.1.16) confirms that the impact of acid deposition can be ruled insignificant.</p> <p>In terms of the critical load for nutrient nitrogen deposition, the contribution from the Proposed Development is predicted to exceed 1% of the minimum critical load at Ebbsfleet Marshes, Northfleet LWS. Transect data provided in Figure 16.21 have been used to calculate the extent of nitrogen deposition based on the area predicted to exceed 1% of the minimum nutrient nitrogen critical load. The area predicted to exceed 1% of the minimum nutrient nitrogen critical load is 3.93ha (8.45% of total site area) (see in Table 12.22). At this level, a significant ecological effect on the site’s integrity is considered unlikely.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant at the local level (on a precautionary basis, subject to further investigation)</p>
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Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>For the ambient NOx critical level, the critical level is predicted to be exceeded at Ebbsfleet Marshes, Northfleet LWS, both with and without the development in place. Further investigation is needed to determine the area predicted to exceed the 1% of the critical level, using transect data, and if this will result in a significant effect in ecology/ site integrity, thereby requiring mitigation. On a precautionary basis, based on the information available, and subject to further investigation, the effect is considered significant at the local level.</p>		
		<p>Damage to habitats from changes to hydrological regime and changes in water quality/quantity.</p>	<p>Temporary-permanent, reversible-irreversible, moderate magnitude and extent.</p>	<p>Significant at Local level</p>
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, potentially giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.</p>	<p>Permanent, irreversible, moderate magnitude and extent.</p>	<p>Significant at Local level</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff) and potential increased recreational use of Swanscombe Peninsula from members of the general public.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant at Local level</p>
<p>Alkerden Lane Pit LWS</p>	<p>County</p>	<p>Damage to habitats from changes in air quality, including from exhaust emissions.</p>	<p>Temporary, reversible, minor magnitude and extent.</p>	<p>Not significant</p>
<p>Disused Hospital Grounds, Mabledon LWS</p>	<p>County</p>	<p>Damage to habitats within the designated area from traffic generated air quality impacts.</p> <p>Chapter 16: Air Quality (Document reference 6.1.16) confirms that the impact of acid deposition, and nutrient nitrogen deposition, can be ruled insignificant.</p> <p>For the ambient NOx critical level, the critical level is predicted to be exceeded at Disused Hospital Grounds, Mabledon LWS, both with and without the development in place. The contribution from the proposed development is predicted to exceed 1% of the critical level across 1.76ha of the LWS accounting for 21.81% of total site area.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant at the local level</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Tilbury Marshes LWS	County	Damage to habitats from changes to hydrological regime and changes in water quality/quantity.	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant at Local level
		Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.	Permanent, irreversible, minor magnitude and extent.	Significant at Local level
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	Permanent, irreversible, minor magnitude and extent.	Significant negative at Local level
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.	Permanent, irreversible, moderate magnitude and extent.	Significant negative at Local level
Habitats/Flora				
Populations of nationally scarce plants	National	N.B. Assessment of potential effects upon scarce plants included under Swanscombe Peninsula SSSI.		

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Retained habitats ⁷² (including woodland, scrub, grassland, open mosaic on previously developed land, wetlands, waterbodies and the River Ebbsfleet).	Local to County (see Baseline section)	Damage to retained habitats, through increased recreational use , potentially resulting in trampling, littering, dog fouling, unauthorised camping/campfires/barbecues.	Permanent, irreversible, moderate magnitude and extent.	Significant at local-County level
		Damage to retained habitats through inappropriate land management practices.	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant at Local-County level
		Damage to retained habitats from changes to hydrological regime and changes in water quality/quantity.	Temporary-permanent, reversible-irreversible, moderate magnitude and extent.	Significant at Local-County level

⁷² Predicted impacts on retained habitats during the operation of the Proposed Development are considered applicable across the full suite of habitats retained, and are therefore considered collectively

<p>Ancient woodland</p>	<p>County</p>	<p>Damage to habitats within the designated area from traffic generated air quality impacts. Increased disposition of N likely to result in nutrient enrichment and acidification of woodland habitat with subsequent changes in structure and diversity.</p> <p>Chapter 16: Air Quality (Document reference 6.1.16) confirms that the impact of acid deposition can be ruled insignificant.</p> <p>In terms of the critical load for nutrient nitrogen deposition, the contribution from the Proposed Development is predicted to exceed 1% of the minimum critical load at the following ecological sites. Transect data provided in Figures 16.20 – 16.24 have been used to calculate the extent of nitrogen deposition based on the area predicted to exceed 1% of the minimum nutrient nitrogen critical load). These areas are provided in brackets in the list below, and in full in Table 12.22.</p> <ul style="list-style-type: none"> • Coombegreen Wood (0.75ha; 4.01% of total site area); • Darenth Wood (8.01ha; 6.52% of total site area); 	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant at the local level</p>
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		<ul style="list-style-type: none"> • Parkhill Wood (1.03ha; 21.59% of total site area); and • The Thrift (1.84ha; 20.74% of total site area). <p>For the ambient NOx critical level, the critical level is predicted to be exceeded at all sites for all scenarios, both with and without the development in place.</p> <p>The contribution from the proposed development is predicted to exceed 1% of the critical level at the following ecological sites:</p> <ul style="list-style-type: none"> • Darenth Wood (26.5ha; 21.72% of total site area); • The Thrift (4.16ha; 50.30% of total site area); • Coombegreen Wood (3.77ha; 22.77% of total site area); • Parkhill Wood; 2.87ha; 60.17% of total site area); • Rams Wood (3.13ha; 86.23% of total site area); 		
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Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<ul style="list-style-type: none"> Disused Hospital; 1.76ha (21.81% of total site area); Cobham Hall Wood; 2.54ha; 49.61% of total site area); Hobbs Hole (1.21ha; 75.16% of total site area); and Jackson Wood (0.59ha; 13.50% of total site area). 		
Species				
Wintering Waterfowl and Wading Bird Assemblage	International	N.B. Assessment of potential habitat loss and disturbance effects upon wintering waterfowl and wading bird assemblage included under SPA/Ramsar Sites.		
		Increased collision risk, with potential for killing/injuring birds, as a result of new tall structures in the local environment.	Permanent, minor magnitude and extent.	Not significant ⁷³

⁷³ Unrestricted flight paths into core habitat area within Black Duck Marsh retained. Botany Marsh West lost resulting in birds less likely to fly over the Swanscombe Peninsula

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Wintering terrestrial bird assemblage	County	Damage to on-site habitats potentially used by birds from changes to hydrology ; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (noise⁷⁴ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bird species using the on-site habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.	Permanent, irreversible, moderate magnitude and extent.	Significant negative at District level
		Increased collision risk , with potential for killing/injuring birds, as a result of new tall structures in the local environment.	Permanent, minor magnitude and extent.	Not significant

⁷⁴ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Breeding Bird Assemblage	National	N.B. Assessment of potential effects upon breeding bird assemblage included under Swanscombe Peninsula SSSI.		
Bat Assemblage	District - County	Damage to on-site habitats potentially used by bats from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bat species using the on-site habitats, including light pollution of foraging, commuting and roosting habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at District level
		Increased collision risk , with potential for killing/injuring bats, as a result of new tall structures in the local environment.	Permanent, minor magnitude and extent.	Not significant
Dormouse	District	Damage to on-site habitats potentially used by dormice from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at Local level

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Disturbance (noise⁷⁵ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to dormice using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at Local level</p>
<p>Otter</p>	<p>Local</p>	<p>Damage to on-site habitats potentially used by otters from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>Temporary-permanent, reversible-irreversible, minor magnitude and extent.</p>	<p>Significant negative at Local level</p>

⁷⁵ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise⁷⁶ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to otters using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at Local level
Water Vole	Local to district	Damage to on-site habitats potentially used by water voles from changes to hydrology ; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at District level

⁷⁶ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		<p>Disturbance (noise⁷⁷ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to water voles using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>Permanent, irreversible, minor magnitude and extent.</p>	<p>Significant negative at District level</p>
<p>Harvest Mouse</p>	<p>Local</p>	<p>Damage to on-site habitats potentially used by harvest mice from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>Temporary-permanent, reversible-irreversible, minor magnitude and extent.</p>	<p>Significant negative at Local level</p>

⁷⁷ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
		Disturbance (noise⁷⁸ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to harvest mice using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at Local level
Amphibian assemblage	Local to district	Damage to on-site habitats potentially used by amphibians from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to amphibians using the on-site habitats, including light pollution of breeding, foraging and hibernation/shelter habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at District level

⁷⁸ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Impact Magnitude	Significance
Reptile assemblage	District	Damage to on-site habitats potentially used by reptiles from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Temporary-permanent, reversible-irreversible, minor magnitude and extent.	Significant negative at District level
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to reptiles using the on-site habitats, including light pollution of potential shelter and hibernation habitats.	Permanent, irreversible, minor magnitude and extent.	Significant negative at District level
Invertebrate assemblage	National	N.B. Assessment of potential effects upon invertebrate assemblages included under Swanscombe Peninsula SSSI.		

Table 12.12 Extent of nitrogen deposition: Darenth Wood SSSI (based on area predicted to exceed 1% of the minimum nutrient nitrogen critical load).

Receptor	Unit	Unit Name	Condition	Area (ha)	Impact area (ha) (within designation)	Impact area (% of total)
Darenth Wood (SSSI/Ancient woodland)	1	Darenth Country Park	Favourable	4.19	0.32	7.63

Receptor	Unit	Unit Name	Condition	Area (ha)	Impact area (ha) (within designation)	Impact area (% of total)
	2	North west	Favourable	17.03	1.25	7.34
	3	North east	Unfavourable - recovering	11.16	1.16	10.40
	4	East	Favourable	8.18	1.40	17.12
	5	Central (badgers mount)	Favourable	18.39	1.68	9.14
	6	West (including former hospital ground)	Favourable	15.41	2.20	14.28
	7	Ladies wood	Favourable	13.49	0.00	0.00
	8	Lords wood	Favourable	32.55	0.00	0.00
	9	Adjacent old hospital site	Favourable	2.52	0.00	0.00
					122.91	8.01

Table 12.13 Extent of NO_x deposition: Darenth Wood SSSI (based on area predicted to exceed 1% of the minimum NO_x critical load).

Receptor	Unit	Unit Name	Condition	Area (ha)	Impact area (ha) (within designation)	Impact area (% of total)
Darenth Wood (SSSI/Ancient woodland)	1	Darenth Country Park	Favourable	4.19	2.18	52.03
	2	North west	Favourable	17.03	4.8	28.19
	3	North east	Unfavourable - recovering	11.16	4.84	43.37
	4	East	Favourable	8.18	6.17	75.43
	5	Central (badgers mount)	Favourable	18.39	4.86	26.43
	6	West (including former hospital ground)	Favourable	15.41	3.65	23.69
	7	Ladies wood	Favourable	13.49	0.00	0.00
	8	Lords wood	Favourable	32.55	0.00	0.00

Receptor	Unit	Unit Name	Condition	Area (ha)	Impact area (ha) (within designation)	Impact area (% of total)
	9	Adjacent old hospital site	Favourable	2.52	1.01	40.08
				122.91	26.5	21.72

Table 12.14 Extent of nitrogen deposition: Ancient Woodlands and Local Wildlife Sites (based on area predicted to exceed 1% of the minimum nutrient nitrogen critical load).

Receptor	Status	Site Area (ha)	Area (ha) within designation exceeding 1% of the critical load)	Impact area (% of total)
Rams Wood	Ancient woodland	3.63	0.21	5.79
The Thrift	Ancient woodland	8.87	1.84	20.74
Parkhill Wood	Ancient woodland	4.77	1.03	21.59
Jackson Wood	Ancient woodland	N/A	0	N/A
Coombegreen	Ancient woodland	18.71	0.75	4.01

Receptor	Status	Site Area (ha)	Area (ha) within designation exceeding 1% of the critical load)	Impact area (% of total)
Ebbsfleet Marshes	Local Wildlife Site	46.49	3.93	8.45
Disused Hospital	Local Wildlife Site	8.07	0.26	3.22

Table 12.15 Extent of nitrogen deposition: Ancient Woodlands and Local Wildlife Sites (based on area predicted to exceed 1% of the minimum nutrient nitrogen critical load).

Receptor	Status	Site Area (ha)	Area (ha) within designation exceeding 1% of the critical load)	Impact area (% of total)
Rams Wood	Ancient woodland	3.63	3.13	86.23
The Thrift	Ancient woodland	8.87	4.16	50.30
Parkhill Wood	Ancient woodland	4.77	2.87	60.17
Jackson Wood	Ancient woodland	N/A	0.59	13.50
Coombegreen	Ancient woodland	18.71	3.77	22.77
Codham Hall Woods	Ancient woodland	5.12	2.54	49.61
Hobbs Hole	Ancient woodland	1.61	1.21	75.16
Disused Hospital	Local Wildlife Site	8.07	1.76	21.81

Biodiversity Impact Assessment

12.248 Under the Environment Act 2021 it will become mandatory for Nationally Significant Infrastructure Projects (NSIPs) to achieve 10% net gain. However, mandatory net gain for NSIPs will not come into effect until secondary legislation has been passed, which is not expected before November 2024.

12.249 Nonetheless, the Applicant has commissioned a Biodiversity Impact Assessment (BIA) of the Proposed Development. The BIA calculations, which are provided in Appendix 12.2: *Biodiversity Impact Assessment* (Document reference 6.2.12.2), have been used to provide an overall biodiversity score for the project using a standardised metric.

12.250 The extent of habitats within the Project Site and the quantities retained, lost and proposed have been assessed using the 'beta test' version of the Biodiversity Metric 2.0, developed by Natural England⁷⁹. As shown in detail in Appendix 12.2 (Document Reference 6.2.12.2), and summarised below, overall, the Proposed Development is considered likely to result in a net loss in habitat units:

- Net biodiversity units (habitat units) = - 1,211.08 units (- 36.15% net loss).

12.251 It should be noted that the calculations are based on the London Resort Masterplan and additional detail regarding landscape treatment as shown on the Landscape Masterplan included within the Landscape Strategy (Document Reference 6.2.11.7), and therefore may be subject to a degree of variance as the detailed design of the resort progresses..

12.252 The Applicant is committed to the funding and delivery of sufficient offsite habitat creation and enhancement to ensure that the post development biodiversity value (as measured in habitat units) exceeds the pre-development baseline.

12.253 It is important to note, however, that the standard metric-based approach to BIA does not adequately account for impacts on protected sites such as SSSIs. This is made clear in the Biodiversity Metric 2.0 User Guide (Beta Version, July 2019)⁸⁰, which includes the following principles and rules for when using the metric:

- *“Principle 1: The metric does not change the protection afforded to biodiversity. Existing levels of protection afforded to protected species and to habitats are not changed by use of this or any other metric. Statutory obligations will still need to be satisfied.*

⁷⁹ <http://publications.naturalengland.org.uk/publication/5850908674228224>

⁸⁰ IAN CROSHER ^A, SUSANNAH GOLD ^B, MAX HEAVER ^D, MATT HEYDON ^A, LAUREN MOORE ^D, STEPHEN PANKS ^A, SARAH SCOTT ^C, DAVE STONE ^A & NICK WHITE ^A. 2019. The Biodiversity Metric 2.0: auditing and accounting for biodiversity value. User guide (Beta Version, July 2019). Natural England A – Natural England, B – Imperial College, University of London, C – Environment Agency, D – Department for Environment, Food and Rural Affairs

- *Principle 2: Biodiversity metric calculations can inform decision-making where application of the mitigation hierarchy and good practice principles⁸¹ conclude that compensation for habitat losses is justified.*
- *Principle 3: The metric's biodiversity units are only a proxy for biodiversity. While it is underpinned by ecological evidence the metric is only a proxy for biodiversity and to be of practical use has been kept deliberately simple. The numerical values generated by the metric represent relative, not absolute, values.*
- *Principle 4: The metric focuses on widespread species and typical habitats. Area based habitats are considered a suitable proxy for widespread species found in typical examples of different habitat types.*
 - *Protected and locally important species needs are not considered through the metric,*
 - *Impacts on protected (e.g. SSSIs) and irreplaceable habitats are not adequately measured by this metric, and will likely require separate consideration."*

12.254 Furthermore, in considering whether biodiversity net gain can also be achieved when compensation of impacts is required, planning policy guidance⁸² associated with the NPPF states:

"Biodiversity net gain complements and works with the biodiversity mitigation hierarchy set out in NPPF paragraph 175a. It does not override the protection for designated sites, protected or priority species and irreplaceable or priority habitats set out in the NPPF. Local planning authorities need to ensure that habitat improvement will be a genuine additional benefit, and go further than measures already required to implement a compensation strategy"

12.255 Thus, ecological enhancement measures can only be deemed to achieve biodiversity net gain where these provide a benefit that goes beyond that required to compensate for impacts which cannot be avoided or mitigated. As described above with respect to construction effects (and below with regard to operational effects) the Proposed Development will unavoidably result in direct negative effects on Swanscombe Peninsula SSSI and its notified features. Such effects are to be addressed through avoidance and mitigation where possible, but inevitably compensatory measures will also be required.

12.256 It is unlikely that the benefits of the off-site enhancement measures proposed will exceed that required to compensate for the on-site impacts on Swanscombe Peninsula SSSI. However, it is anticipated the proposed off-site enhancement measures will result in a net gain in biodiversity units when measured using a standard Biodiversity Metric.

⁸¹ CIEEM, CIRIA, IEMA. 2016 Biodiversity Net Gain – Good Practice Principles for Development. https://www.cieem.net/data/files/Publications/Biodiversity_Net_Gain_Principles.pdf

⁸² <https://www.gov.uk/guidance/natural-environment>; Paragraph: 024 Reference ID: 8-024-20190721, Revision date: 21 07 2019

PROPOSED MITIGATION

12.257 The preceding section of this chapter describes the potential significant environmental effects of the Proposed Development and provides an overview of the inherent mitigation measures incorporated into the Proposed Development. However, not all likely significant negative effects identified can be avoided or reduced in severity through inherent mitigation alone. This section therefore identifies those additional mitigation measures proposed to avoid or reduce the likely significant negative impacts.

12.258 The key mechanisms to deliver mitigation will include measures to:

- Conform with relevant and pertinent legislative requirements, particular those associated with legally protected species; and
- Deliver and, where possible, maximise opportunities for biodiversity enhancement and gain through the Proposed Development.

12.259 The mitigation strategies in respect of certain statutory designations, legally protected species and species of conservation concern have been developed in consultation with Natural England through their Discretionary Advice Service and a series of meetings as set out in **Table 12.2**.

Construction Measures

12.260 The key mechanisms to deliver avoidance or mitigation of potential significant construction effects are summarised below. Further details on these measures, including which IEFs and effects they relate to, are provided within **Table 12.14**.

Construction Environmental Management Plan (CEMP)

12.261 The Principal Contractor for the Proposed Development will produce a Construction Environmental Management Plan (CEMP) to include mitigation measures to protect the environment during both the demolition and construction phases. The CEMP will be secured by a requirement in the DCO. An Outline CEMP has been prepared in support of the DCO application (Document Reference 6.2.3.2). With regard to the avoidance and mitigation of effects on ecological features, the following measures are to be included within the CEMP:

- Restricted working hours and a Sensitive Lighting Strategy (SLS) to minimise impacts on nocturnal wildlife;
- Suppression of construction noise and dust;
- Use of site screening/hoarding to minimise visual, aural and light disturbance;

- Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy; and
- Adherence to pollution prevention guidelines.

Ecological Construction Method Statements (ECMSs)

12.262 A series of ECMSs are contained within an overarching Ecological Mitigation and Management Framework (EMMF) (Document Reference 6.2.12.3), which will be secured as a requirement of the DCO. The measures contained within the ECMSs include (but are not limited to):

- Provision of an Ecological Clerk of Works (ECoW) to supervise construction activities in sensitive areas for habitats and species;
- Provision of 'toolbox talks' to relevant site contractors;
- Method statements for the delivery of works in sensitive areas, including controls over timing/duration of works to avoid sensitive times of year (e.g. the bird breeding season);
- Precautionary methods of working and sensitive vegetation/site clearance (under a European Protected Species where necessary), e.g. 'soft-felling' trees with bat roost potential or removal of suitable dormouse habitat;
- Translocation/displacement of protected species prior to construction works commencing (under a European Protected Species where necessary);
- Sensitive lighting strategy (SLS) to minimise impacts on nocturnal wildlife, where possible;
- Establishment of Ecological Protection Zones (EPZs), through use of protective fencing, to prevent construction activities damaging retained habitats;
- Creation of EPZs coordinated with standard arboricultural management and tree protection measures;
- Bird Monitoring Response Strategy (BMRS) - monitoring of bird use on retained intertidal habitats and functionally linked land during construction with additional control/mitigation measures enforced if the numbers of birds within the monitored area fall below a certain threshold; and
- Update ecology surveys prior to commencement of works.

Mitigation Strategies and Licenses

12.263 The EMMF also contains feature-specific Mitigation and/or Management Strategies, including measures to address construction impacts, for the following features:

- SPAs and wintering birds;
- Swanscombe Peninsula SSSI (including rare plants, breeding birds and invertebrates)
- Bats;
- Dormouse;
- Water vole;
- Otters;
- Harvest mouse;
- Amphibians;
- Reptiles;
- Other rare plants; and
- Invasive plants.

12.264 In the case of certain legally protected species confirmed present on the Kent Project Site where mitigation licenses will be required before development can proceed, including bats, dormice, water vole, and otter, these Mitigation Strategies effectively provide details of the impact avoidance, mitigation measures which, when taken together with off-site compensatory measures where relevant, will ensure the Proposed Development is capable of achieving the relevant EPS/development licenses.

Creation/Enhancement of Functionally Linked Habitat

12.265 Potential indirect effects on several designated sites have been identified which relate to the net loss (and disturbance) of habitat within the Project Site, which is likely to be functionally linked in terms of cited bird species using on-site wetland and intertidal areas within the Project Site for feeding and/or refuge. The designated sites in question are as follows:

- Thames Estuary and Marshes SPA/Ramsar (including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI);

- Medway Estuary and Marshes SPA/Ramsar/SSSI;
- West Thurrock Lagoon and Marshes SSSI;
- Inner Thames Marshes SSSI; and
- Tilbury Marshes LWS

12.266 Potential negative effects within these designated sites as a consequence of habitat loss within the Project Site will be avoided or mitigated by the creation or enhancement of new habitat outside of the Project Site but within the functional range of the relevant bird species.

12.267 Owing to the nature of the potential effects, these off-site measures represent 'avoidance and mitigation' with reference to the mitigation hierarchy sequence, rather than being compensatory measures. This is an important distinction with respect to European Sites, since avoidance and mitigation measures are taken into consideration at the Appropriate Assessment Stage (Stage 2) of the Habitats Regulations Assessment (HRA) process (see Appendix 12.4; Document Reference 6.2.12.4). Similarly, these measures are taken into consideration in this ES Chapter when identifying any residual effects.

12.268 Whilst being deemed avoidance and mitigation for the reasons explained above, these measures will be delivered off-site and are therefore detailed within the Ecological Compensation Framework (Appendix 12.10; Document Reference 6.2.12.10) together with a range of other measures proposed to compensate for impacts on on-site features.

12.269 The extent of new functionally linked habitat (259.33ha) significantly exceeds the area to be lost directly as a result of the Proposed Development. This will therefore avoid or mitigate the effects of any further reduction in the habitat area which is used by cited bird species for feeding and/or refuge as a result of unavoidable disturbance from construction activities.

Table 12.14: Avoidance and Mitigation of Potential Significant Construction Effects

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
Thames Estuary and Marshes SPA/Ramsar, and the component SSSIs including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI	International	<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>	
		Direct loss of/damage to functionally linked land on the Kent Project Site, potentially used by cited bird species , totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the Ecological Mitigation and Management Framework (EMMF) (Document Reference 6.2.12.3). Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
Damage to functionally linked habitats potentially used by cited bird species from	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust		

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>changes in air quality including from dust, construction waste and pollutants.</p>	<p>Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of Invasive Non-Native Species (INNS).</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
		<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Bird Monitoring Response Strategy (BMRS) - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious construction activities then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
		<p>Disturbance (noise and lighting) associated with construction activities, giving rise to</p>	<p>CEMP and Sensitive Lighting Strategy (SLS) - Restricted working hours and sensitive design and location of new</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to estuary front</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
<p>Medway Estuary and Marshes SPA/Ramsar/SSSI⁸³</p>	<p>International</p>	<p><i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i></p>	<p>Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).</p> <p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 –</p>
		<p>Direct loss of/damage to functionally linked land on the Kent Project Site, potentially used by cited bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core</p>	
		<p>Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage</p>	

⁸³ Medway Estuary and Marshes SSSI is a component SSSI to the Medway Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.</p>	<p>Water Resources and Flood Risk (Document Reference 6.1.17).</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS.</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
		<p>Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to estuary front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
Swanscombe Peninsula SSSI	National	Overall reduction in SSSI area, and fragmentation by the Resort.	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, maintenance of scrub habitats across the Peninsula to

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>allow terrestrial bird species to disperse between habitats and maintenance of unrestricted flight path from River Thames into Black Duck Marsh via retaining and managing low-growing vegetation at northern edge of marsh. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula, delivered through the EMMF and Landscape Strategy.</p>
		<p>Damage to habitats within the designated area from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>
		<p><i>Special feature of interest - populations of rare plants⁸⁴:</i></p>	
		<p>Direct loss of individual plants/supporting habitat, and part of plant meta-population through loss of habitat within SSSI.</p>	<p>Landscape Strategy - enhancement of retained habitats on Swanscombe Peninsula and creation of new habitats, managed via the Swanscombe Peninsula SSSI Mitigation Strategy.</p>

⁸⁴ Includes only those rare plant populations listed as a reason for notification of the Swanscombe Peninsula SSSI, including divided sedge (*Carex divisa*), yellow vetchling (*Lathyrus aphaca*), slender hare's-ear (*Bupleurum tenuissimum*), Bithynian vetch (*Vicia bithynica*) and round-leaved wintergreen (*Pyrola rotundifolia subsp. maritima*). A separate assessment of potentially significant effects upon 'non-SSSI' rare plants is provided under the 'rare plants' IEF.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – and subsequent detailed strategies for the translocation of nationally scarce plants/seed bank occurring on the Kent Project Site.
		Damage to retained plants from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to individual plants/supporting habitat from adjacent construction works and deposition of construction materials.	CEMP and Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.
		Damage to plants/their habitats from introduction or proliferation of INNS .	Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – including details on control/eradication of existing populations of non-native species.
		<i>Special feature of interest - breeding bird assemblages:</i>	
		Direct killing, injury or harm to individuals – during vegetation clearance.	CEMP, and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – including sensitive timing and methodology for habitat clearance, establishment of EPZs to protect retained habitats.
		Direct habitat loss – loss of suitable habitat such as scrub, grassland, reedbed and woodland.	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) - enhancement of retained scrub habitat through rotational management to create age class and structural diversity, and maintenance of site wide open mosaic habitats to

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			provide variety of foraging resources, managed via the EMMF.
		Damage to supporting habitats from changes to hydrological regime and changes to water and/or sediment quality.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS.	Swanscombe Peninsula SSSI Mitigation Strategy – including details on control/eradication of existing populations of non-native species.
		Habitat fragmentation, loss of flight paths and dispersal routes.	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, maintenance of scrub habitats across the Peninsula to allow terrestrial bird species to disperse between habitats and maintenance of unrestricted flight path from River Thames into Black Duck Marsh via retaining and managing low-growing vegetation at northern edge of marsh. Creation of new wetland and saltmarsh

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (from shipping/ferry movements) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>habitats on Swanscombe Peninsula, delivered through the EMMF and Landscape Strategy.</p> <p>BMRS - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious construction activities then those disturbance activities will be temporally ceased.</p>
		<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>
		<p>Disturbance (human movement or activity) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the SSSI Mitigation Strategy</p>
		<p><i>Special feature of interest - invertebrate assemblages:</i></p>	
		<p>Direct habitat loss – loss of suitable habitat, particularly Open Mosaic Habitat on Previously Developed Land.</p>	<p>Landscape Strategy, and Swanscombe Peninsula SSSI Mitigation Strategy (Invertebrates) – enhancement of existing retained open mosaic habitat (OMH) to better quality and creation of new brown roofs as described previously. Furthermore, enhancement of retained wetland habitat within Botany Marsh East and Black Duck Marsh through reduction of scrub encroachment, selective ditch re-profiling, and creation of additional scrapes and deep areas in Black Duck Marsh. Creation of additional saltmarsh habitat on the north eastern edge of Swanscombe Peninsula through ‘retiring’ the flood defence. Creation of a number of habitats of value to invertebrates within the amenity spaces within the</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			resort itself, including native tree and shrub planting, wildflower strips, green roofs and walls and 'bug hotels'.
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS.	Swanscombe Peninsula SSSI Mitigation Strategy – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation.	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy (Invertebrates) – retention and enhancement of large area of open mosaic habitat on the Kent Project Site, connected to existing semi-natural habitats.
		Disturbance (lighting) – as described above in relation to impacts on SPA/Ramsar sites.	CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.
Darenth Woods SSSI	National	Damage to habitats within the designated area from changes in air quality , including from	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines,

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>dust, construction waste and pollutants, and exhaust emissions.</p>	<p>to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/maintenance, site monitoring, operation of vehicles/machinery/power tools, and techniques for demolition works, earthworks and construction.</p>
<p>Inner Thames Marshes SSSI</p>	<p>National</p>	<p><i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i></p> <p>Direct loss/damage to functionally linked habitats on the Kent Project Site, potentially used by cited bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.</p> <p>Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants;</p>	<p>Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10)</p> <p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.</p>	
		<p>Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/maintenance, site monitoring, operation of vehicles/machinery/power tools, and techniques for demolition works, earthworks and construction.</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS.</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
		<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited species potentially using functionally linked habitats.</p>	<p>the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p> <p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p>
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		presence on the Project Site during construction.	<p>to take place in summer months, where possible; and access by construction workers to estuary front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
West Thurrock Lagoon and Marshes SSSI	National	<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>	
		<p>Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by cited bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (CTRL wetland and Black Duck Marsh) to accommodate construction of the Leisure Core.</p>	<p>Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland</p>	<p>CEMP – Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 –</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.</p>	<p>Water Resources and Flood Risk (Document Reference 6.1.17).</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>
		<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS.</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
		<p>Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited species potentially using functionally linked habitats.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to estuary front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
Botany Marshes LWS	County	<p>Damage to habitats from changes in air quality, including from dust, construction waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.
		Damage to habitats from changes to hydrological regime (through destruction of adjoining wetland/grazing marsh), and changes in water quality/quantity.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to habitats from adjacent construction works and deposition of construction materials.	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of Ecological Protection Zones (EPZs) where no construction vehicles/works are permitted and where no materials or site facilities may be situated.
		Disturbance (noise and lighting) associated with construction activities, giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
Ebbsfleet Marshes, Northfleet LWS	County	Direct loss of/damage to habitat through Station Quarter South.	Landscape Strategy – Retention of site wide open mosaic of habitats within retained parts of Swanscombe Peninsula, and new constructed wetland, managed through the EMMF (Document Reference 6.2.12.3).
		Damage to habitats from changes in air quality , including from dust, construction waste and pollutants .	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.
		Damage to habitats from changes to hydrological regime (through destruction of habitat within floodzone of River Ebbsfleet), and changes in water quality/quantity .	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to habitats from adjacent construction works and deposition of construction materials.	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.
		Disturbance (noise and lighting) associated with construction activities, giving rise to displacement, behavioural changes or	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		physiological stress to wildlife species within the designated area.	<p>CEMP – sensitive timing of works, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>
Alkerden Lane Pit LWS	County	Loss of part of plant and invertebrate meta-population through loss of habitat in the Kent Project Site.	<p>Landscape Strategy - enhancement of retained habitats on Swanscombe Peninsula and creation of new habitats, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>EMMF and subsequent detailed strategies for the translocation of nationally scarce plants/seed bank occurring on the Kent Project Site.</p>
		Damage to habitats from changes in air quality, including from dust, construction waste and pollutants.	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>
Tilbury Marshes LWS	County	Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially	Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>used by bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.</p>	<p>saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).</p>
		<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.</p>	<p>BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
		<p>Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to estuary front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p>
Habitats/Flora			

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
Populations of nationally scarce plants	National	N.B. Mitigation of potential effects upon scarce plants included under Swanscombe Peninsula SSSI	
Broad leaved Semi Natural Woodland	Local	Direct loss of habitat from woodland south of Black Duck Marsh – 3.84ha lost from a total of 21.37ha (18% of the existing total).	Landscape Strategy - enhancement of retained habitats on Swanscombe Peninsula and creation of new habitats, managed via the EMMF (Document Reference 6.2.12.3).
		Damage to habitat from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
Ancient woodland	County	Damage to habitats within the designated area from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.
Scrub	Local	Direct loss of habitat , a total of 34.79ha lost (41.71% of the existing total)	Landscape Strategy and EMMF –. enhancement of retained scrub habitats and commencement of rotational management to avoid excessive encroachment and to maintain varied structure and open mosaic habitat.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Damage to habitats from adjacent construction works and deposition of construction materials in Root Protection Area (RPA).</p>	<p>CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.</p>
		<p>Damage to habitat from construction dust, waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.</p>
		<p>Damage to habitats from introduction or proliferation of INNS.</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
<p>Semi-improved grassland</p>	<p>Local to District</p>	<p>Direct loss of habitat, a total of 34.79ha lost (41.71% of the existing total)</p>	<p>Landscape Strategy and EMMF – management of existing, retained habitats on Swanscombe Peninsula through commencement of rotational management to avoid excessive scrub encroachment and to maintain varied structure and open mosaic habitat, and create new opportunities for the development of species-rich wildflower grassland.</p>
		<p>Damage to habitats from adjacent construction works and deposition of construction materials.</p>	<p>CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		Damage to habitat from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to habitats from introduction or proliferation of INNS .	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
Coastal/flood plain grazing marsh	District	Direct loss of habitat , 13.74ha lost (100% of the existing total). All CFGM is also included under the Floodplain Wetland Mosaic grouping, within the biodiversity impact calculations (Document reference 6.2, Appendix 12.2).	No on-site measures possible/proposed.
Open mosaic on previously developed land	District	Direct loss of habitat , 39.83ha lost (63.7% of the existing total), includes a range of individual habitat components including areas of bare ground, ephemeral vegetation, open grassland and patches of scrub.	Landscape Strategy , and Swanscombe Peninsula SSSI Mitigation Strategy included in the EMMF – enhancement of existing retained open mosaic habitat (OMH) through introduction of greater variety and complexity, maintaining a range of microhabitats, foodplants and nectar sources. Measures include creation of bare ground scrapes, creation of shallow pools of varying depth, creation of piles/mounds of mixed crushed and coarse concrete rubble, and creation of chalk mounds and low bunds. Furthermore, creation of brown roof habitat on new buildings using substrate

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			(crushed concrete and chalk) originating from the Proposed Development footprint.
		Damage to habitats from adjacent construction works and deposition of construction materials.	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.
		Damage to habitat from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to habitats from introduction or proliferation of INNS.	<p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
Waterbodies (ponds, standing water and ditch network)	District	Direct loss of habitat , 2.30ha of waterbodies lost (50.79% of the existing total) and 4.7km of ditches (50.98% of the existing total). 0.22ha of lost waterbodies are also included under the Floodplain Wetland Mosaic grouping, within the biodiversity impact calculations (Document reference 6.2.12.2, Appendix 12.2).	Landscape Strategy - Creation of new waterbodies/wetlands on Swanscombe Peninsula, including new perimeter swale and new constructed wetland, managed through the EMMF (Document Reference 6.2.12.3).
		Damage to habitats from changes to hydrological regime (through destruction of	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 –

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		surrounding habitats), and changes in water quality/quantity.	Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to habitat from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to habitats from introduction or proliferation of INNS.	<p>Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
Swamp (reedbed)	County	Direct loss of habitat from 13.02ha lost (42.99% of total area). 2.84ha of reedbed is also included under the OMHPDL grouping and 0.88ha under Floodplain Wetland Mosaic, within the biodiversity impact calculations (Document reference 6.2.12.2, Appendix 12.2).	Landscape Strategy - Creation of new waterbodies/wetlands on Swanscombe Peninsula, including new perimeter swale and new constructed wetland, managed through the EMMF (Document Reference 6.2.12.3).
		Damage to habitats from adjacent construction works and deposition of construction materials.	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.
		Damage to habitats from changes to hydrological regime (through destruction of surrounding habitats), and changes in water quality/quantity.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 –

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to habitat from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to habitats from introduction or proliferation of INNS .	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
River Ebbsfleet	Local	Direct loss of connected floodplain habitat within Ebbsfleet Valley, such as waterbodies and semi-improved grassland.	Landscape Strategy - Creation of new waterbodies/wetlands on Swanscombe Peninsula, including new perimeter swale and new constructed wetland, managed through the EMMF (Document Reference 6.2.12.3).
		Damage to habitat from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to habitats from changes to hydrological regime (through destruction of	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 –

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		surrounding habitats), and changes in water quality/quantity . Damage to habitats from introduction or proliferation of INNS .	Water Resources and Flood Risk (Document Reference 6.1.17). Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
Species			
Wintering Waterfowl and Wading Bird Assemblage	International	N.B. Assessment of potential habitat loss and disturbance effects upon wintering waterfowl and wading bird assemblage included under SPA/Ramsar Sites. Direct killing, injury or harm to individuals – during vegetation clearance.	CEMP and SPA and Winter Bird Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including sensitive timing and methodology for habitat clearance, establishment of EPZs to protect retained habitats.
Wintering terrestrial bird assemblage	County	Direct killing, injury or harm to individuals – during vegetation clearance. Direct habitat loss – loss of suitable habitat such as scrub, grassland, reedbed and woodland, as detailed above.	CEMP and SPA and Winter Bird Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including sensitive timing and methodology for habitat clearance, establishment of EPZs to protect retained habitats. Landscape Strategy and SPA and Winter Bird Mitigation Strategy included within EMMF - enhancement of retained scrub habitat through rotational management to create age class and structural diversity, and

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			maintenance of site wide open mosaic habitats to provide variety of foraging resources, managed via the EMMF.
		Damage to functionally linked habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on SPA/Ramsar sites.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to functionally linked habitats from introduction or proliferation of INNS – as described above in relation to impacts on SPA/Ramsar sites.	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation, loss of flight paths and dispersal routes.	Landscape Strategy and EMMF (Document Reference 6.2.12.3)– maintenance of scrub habitats across the Peninsula to allow terrestrial bird species to disperse between habitats.
		Disturbance (from shipping/ferry movements) – as described above in relation to impacts on SPA/Ramsar sites.	BMRS - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious construction activities

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			then those disturbance activities will be temporally ceased.
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>
		Disturbance (human movement or activity) – as described above in relation to impacts on SPA/Ramsar sites.	CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible;

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>
Breeding Bird Assemblage	National	N.B. Impact assessment for the breeding bird assemblage included under Swanscombe Peninsula SSSI.	
Bat Assemblage	District - County	<p>Direct killing, injury or harm to individuals – during demolition of buildings with bat roost potential and trees with bat roost potential.</p>	<p>CEMP, and Bat Mitigation Strategy included within EMMF (Document Reference 6.2.12.3)– including pre-commencement surveys of structures/trees to be demolished/felled, and receipt of European Protected Species Mitigation Licence (EPSML), or site registration under the Bat Mitigation Class Licensing (BMCL) scheme, prior to works commencing, with precautionary method of working (as prescribed by the license), strictly adhered to. Establishment of EPZs to protect retained habitats.</p>
		<p>Direct loss of potential roosting habitat – including trees, buildings and structures with bat roost potential.</p>	<p>Landscape Strategy and Bat Mitigation Strategy included in EMMF Document Reference 6.2.12.3) – creation of new bat roosting habitat, including bat boxes incorporated into new buildings and into the two new bird watching towers, and enhancement of hibernation habitat within retained tunnels.</p>
		<p>Direct loss of foraging, commuting and dispersal habitats - loss of suitable foraging habitat such as scrub, grassland, reedbed and</p>	<p>Landscape Strategy and EMMF (Document Reference 6.2.12.3) – creation/maintenance of a range of habitats including woodland, scrub, wetlands, waterbodies, reedbeds, saltmarsh and invertebrate rich habitats,</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		woodland, as detailed above, including potential winter foraging habitat.	collectively will maintain foraging and commuting bat population on site.
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS.	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation, loss of flight paths and dispersal routes.	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, maintenance of scrub habitats across the Peninsula, and retention of habitat link to the River Thames to allow bats to disperse between habitats on- and off-site.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) – including on retained roosts, foraging areas and commuting routes.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>
<p>Dormouse</p>	<p>District</p>	<p>Direct killing, injury or harm to individuals – during vegetation clearance.</p>	<p>CEMP, and Dormouse Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement surveys of suitable dormouse habitat, and receipt of European Protected Species Mitigation Licence (EPSML) prior to habitat clearance commencing, with dormouse displacement methodologies and precautionary method of working (as prescribed by the license), strictly adhered to. Establishment of EPZs to protect retained habitats.</p>
		<p>Direct habitat loss – loss of suitable habitat such as scrub and woodland, as detailed above</p>	<p>Landscape Strategy and Dormouse Mitigation Strategy included EMMF (Document Reference 6.2.12.3) – enhancement of existing scrub habitats to ensure habitats remain suitable for dormice, through rotational scrub management to improve structural and age class diversity and maintain variety of food sources throughout the dormouse active season.</p>
		<p>Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 –</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS .	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation and loss of dispersal routes.	Landscape Strategy and Dormouse Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – retention of areas of suitable habitat within Broadness grassland, including existing woodland, tree and scrub habitats; retention and management of dense bramble and low growing scrub and trees along the north western boundaries of Black Duck Marsh, to maintain potential dispersal routes from Swanscombe Peninsula to the south-west; retention and enhancement of a continuous belt of woodland habitat along the southern boundaries of Black Duck Marsh, connecting to additional green corridors proposed along the southern boundary adjacent to Tiltman Avenue, to ensure the continued functioning of existing dispersal routes to

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>valuable off-site habitats to the south-west, including the woodland at the Swanscombe Heritage Park; and retention, enhancement and creation of additional woodland habitat alongside the sensitive design of new landscaping around the peripheries of Botany Marsh, necessary to further promote habitat connectivity between Swanscombe Peninsula and habitats across the wider landscape to the south.</p> <p>CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>
Otter	Local	<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p> <p>Direct killing, injury or harm to individuals – during vegetation clearance.</p> <p>Direct habitat loss – loss of suitable habitat such as reedbed and waterbodies, as detailed above.</p>	<p>CEMP, and Otter Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement surveys of suitable habitat, sensitive habitat clearance methodology, and establishment of EPZs to protect retained habitats. In the event an otter holt is found within the Proposed Development footprint, a European Protected Species Mitigation Licence (EPSML) will be needed prior to habitat clearance commencing.</p> <p>Landscape Strategy - new constructed wetland managed through the EMMF (Document Reference 6.2.12.3). Creation of two new artificial otter holts as</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			described in the Otter Mitigation Strategy included in the EMMF.
		<p>Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>
		<p>Damage to supporting habitats from construction dust, waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.</p>
		<p>Damage to supporting habitats from introduction or proliferation of INNS.</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
<p>Habitat fragmentation and loss of dispersal routes.</p>	<p>Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula.</p>		

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>
<p>Water Vole</p>	<p>Local to district</p>	<p>Direct killing, injury or harm to individuals – during vegetation clearance.</p>	<p>CEMP, and Water Vole Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement surveys of suitable habitat, establishment of suitable receptor site, and water vole relocation under licence from Natural England (granted prior to habitat clearance commencing). Establishment of EPZs to protect retained habitats.</p>
		<p>Direct habitat loss – including 6.1km of suitable ditches and bankside habitat and reedbed (as detailed above).</p>	<p>Landscape Strategy - Creation of new wetlands and ditches on Swanscombe Peninsula, as documented within the Water Vole Mitigation Strategy included within EMMF (Document Reference 6.2.12.3).</p>
		<p>Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>
		<p>Damage to supporting habitats from construction dust, waste and pollutants.</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Management Plan (DMP) to provide measures to control dust and other emissions.
		<p>Damage to supporting habitats from introduction or proliferation of INNS.</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>
		<p>Habitat fragmentation and loss of dispersal routes.</p>	<p>Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula.</p>
		<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>
Harvest Mouse	Local	<p>Direct killing, injury or harm to individuals – during vegetation clearance.</p>	<p>CEMP, and Harvest Mouse Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement check of suitable habitat, and</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			precautionary method of working strictly adhered to. Establishment of EPZs to protect retained habitats.
		Direct habitat loss – loss of suitable habitat such as reedbed, semi-improved grassland, scrub and tall ruderal, as detailed above.	Landscape Strategy and Harvest Mouse Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – maintenance of site wide open mosaic habitat including a range of habitats of value to harvest mice including rough, tussocky grassland, tall riparian/marginal/reedbed habitat with adjacent scrub to provide refuge, foraging and breeding opportunities.
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS .	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation and loss of dispersal routes.	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, and maintenance of scrub and rough grassland habitats across the Peninsula to allow individuals to disperse between habitats.</p>
		<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>
Amphibian assemblage	Local to District	<p>Direct killing, injury or harm to individuals – during vegetation clearance.</p>	<p>CEMP, and Amphibian Mitigation Strategy included within EMMF – including translocation of amphibians in tandem with reptile translocation, precautionary methods of working including sensitive drain down of any waterbodies to be removed, timing of works, and establishment of EPZs to protect retained habitats.</p>
		<p>Direct habitat loss – loss of suitable habitat such as reedbed and waterbodies, as detailed above.</p>	<p>Landscape Strategy and Amphibian Mitigation Strategy included within EMMF - Creation of new wetlands, ditches, ponds and waterbodies on Swanscombe Peninsula, as described above in relation to water voles and otters, will also mitigate habitat loss impacts to amphibians.</p>
		<p>Damage to habitats from changes to hydrological regime and changes to water</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		and/or sediment quality – as described above in relation to impacts on habitats.	Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS .	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation and loss of dispersal routes.	Landscape Strategy and EMMF – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula, delivered through the EMMF and Landscape Strategy.
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. CEMP – adoption of mitigation measures to control construction noise and vibration, as described in

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).
Reptile assemblage	District	Direct killing, injury or harm to individuals – during vegetation clearance.	CEMP , and Reptile Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including establishment of suitable receptor site and subsequent translocation of reptiles from construction footprint prior to vegetation clearance commencing, and precautionary methods of working. Establishment of EPZs to protect retained habitats.
		Direct habitat loss – loss of suitable habitat such as semi-improved grassland, reedbed and tall ruderal, as detailed above.	Landscape Strategy and Reptile Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – maintenance of site wide open mosaic habitats on Swanscombe Peninsula to maintain a variety of foraging resources, breeding, basking, sheltering and hibernation habitats. Management of grassland areas to encourage development of structurally complex grassland sward with substantial ‘litter layer’ and areas of bare ground. Creation of log/brush piles and hibernaculum to provide sheltering and hibernating habitats, and grass snake breeding sites from piling arisings from grass cutting.
		Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Damage to supporting habitats from construction dust, waste and pollutants.	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			Management Plan (DMP) to provide measures to control dust and other emissions.
		Damage to supporting habitats from introduction or proliferation of INNS .	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.
		Habitat fragmentation and loss of dispersal routes.	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, and maintenance of scrub and rough grassland habitats across the Peninsula to allow individuals to disperse between habitats. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula.
		Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).
Invertebrate assemblage	National	N.B. Impact assessment for the invertebrate assemblage included under Swanscombe Peninsula SSSI.	

Post-construction and Operational Measures

12.270 The key mechanisms to avoid or mitigate potential significant operational effects are summarised below. Further details on these measures, including which IEFs they relate to, are provided within **Table 12.15**.

A Landscape Management Plan (LMP)

12.271 A Landscape Management Plan (LMP) (ES Appendix 11.8, Document Reference 6.2.11.8) has been prepared in support of the DCO application and should be read in conjunction with the overarching Ecological Mitigation and Management Framework (EMMF) provided as Appendix 12.3 (Document Reference 6.2.12.3). The measures contained within the LMP include (but are not limited to):

- Prescriptions for the ongoing management, maintenance and monitoring of the IEFs and of those newly created habitats to maximise opportunities for biodiversity enhancement and gain;
- Management of open spaces for biodiversity, with controlled/restricted recreational use within sensitive areas;
- Objectives and principles for the long-term management of ecology interests; and
- Compliance checks and monitoring to ensure the success of the implemented measures against the objectives and principles, with interventions carried out as necessary.

Species Mitigation Strategies and Licenses

12.272 The EMMF also contains individual Mitigation Strategies, including measures to address operational impacts, for the following species or species groups:

- Breeding and wintering birds;
- Bats;
- Dormouse;
- Water vole;
- Otters;
- Harvest mouse;
- Amphibians;

- Reptiles;
- Invertebrates; and
- Rare plants

12.273 In the case of certain legally protected species confirmed present on the Kent Project Site where mitigation licenses will be required before development can proceed, including bats, dormice, water vole, and otter, these Mitigation Strategies effectively provide details of the impact avoidance, mitigation and compensation measures necessary to ensure the Proposed Development is capable of achieving the relevant licenses, and will be used to inform applications for such licenses.

Landscape Strategy

12.274 A Landscape Strategy has been prepared in support of the DCO application and is provided as Appendix 11.7 (Document Reference 6.2.11.7). This provides the overall landscape and green infrastructure design for the Proposed Development and forms the basis for a fully detailed Soft Landscaping Scheme (SLS) to be prepared post-consent. Together these will provide overarching design principles and full specifications of new habitat creation and the necessary infrastructure to provide controlled/restricted access for recreation in the open space.

Sustainable Drainage System

12.275 Sustainable Drainage Systems (SuDS) will be incorporated across the Kent Project Site to manage surface water flows and minimise the risk of pollution to the water environment. Appendix 17.2: Surface Water Drainage Strategy (Document reference 6.2.17.1) has been prepared to both avoid or mitigate any potential effects on water quality and flow within sensitive habitats, and to provide suitable hydrological conditions for new wetland habitats of ecological value to become established. Future SuDS design will adhere to Appendix 17.2: Surface Water Drainage Strategy (Document reference 6.2.17.1).

Sensitive Lighting Strategy (SLS)

12.276 An Artificial Lighting Environmental Impact Assessment (Document reference 6.2.12.11) has been prepared for the Proposed Development. This document, along with the Lighting Statement (Document reference 7.9) sets out a lighting strategy and design principles to avoid/minimise light spill on habitats used by sensitive/nocturnal species, where possible. Collectively, these documents are considered part of the Sensitive Lighting Strategy, as referred to in Table 12.13 below, which provides mitigation for operational effects, and is to be secured as a requirement of the DCO.

12.277 The SLS should be read in conjunction with Figure 12.45: Light Mitigation Strategy for Biodiversity (Document Reference 6.3.12.45).

Contribution to SAMMS

12.278 Potential indirect effects on effects upon Thames Estuary and Marshes SPA have been identified, which relate to increased recreational disturbance resulting from the new residential dwellings (staff accommodation) associated with the Proposed Development.

12.279 As described within the Shadow HRA (Appendix 12.4; Document Reference 6.2.12.4), these effects will be avoided or mitigated through a financial contribution to the Strategic Access Management and Monitoring Strategy (SAMMS), which is in operation across the Thames, Medway and Swale estuaries. This strategy ensures that recreational pressures on the three SPA/Ramsar sites relating to those estuaries is managed sufficiently, through a combination of education, access restrictions, enhancement and ranger presence. This is implemented through financial contributions from developers.

Creation/Enhancement of Functionally Linked Habitat

12.280 As described above with respect to mitigation of construction effects, the creation or enhancement of new habitat, outside of the Project Site but within the functional range of relevant bird species, is proposed to mitigate potential effects on relevant statutory designated sites from the loss of functionally linked habitat within the Project Site.

12.281 Whilst being deemed avoidance and mitigation for the reasons explained above, these measures will be delivered off-site and are therefore detailed within the Ecological Compensation Framework (Appendix 12.10; Document Reference 6.2.12.10) together with a range of other measures proposed to compensate for impacts on on-site features.

12.282 The extent of new functionally linked habitat (259.33ha) significantly the area to be lost directly as a result of the Proposed Development. This will therefore also avoid or mitigate the effects of any further reduction in the habitat area which is used by cited bird species for feeding and/or refuge as a result of unavoidable disturbance of retained habitats during the operational phase of the development. This is discussed in further detail in respect of European Sites within Appendix 12.4; Document Reference 6.2.12.4).

Table 12.15: Avoidance and Mitigation of Potential Significant Operational Effects

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
Thames Estuary and Marshes SPA/Ramsar, and the component SSSIs including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI ⁸⁵	International	<i>Potential impacts within the European/Ramsar Site itself:</i>	
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Contribution to SAMMS – proportionate financial contribution to strategic access management.
		<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>	
		Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Sustainable Drainage System (SuDS) – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17). SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.
Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to	BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious		

⁸⁵ South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI are component SSSIs to the Thames Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species using functionally linked habitats.</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
	International	<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>	

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
Medway Estuary and Marshes SPA/Ramsar/SSSI ⁸⁶		<p>Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants)</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to</p>

⁸⁶ Medway Estuary and Marshes SSSI is a component SSSI to the Medway Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>address any residual disturbance effects on retained habitats.</p> <p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p> <p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
Swanscombe Peninsula SSSI	National	<p>Damage to habitats within the designated area from traffic generated air quality impacts resulting in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity.</p>	<p>Landscape Strategy, LMP and SSSI Mitigation Strategy – habitat management and monitoring.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<i>Special feature of interest - populations of rare plants⁸⁷:</i>	
		Damage to individual plants/supporting habitat, and part of plant meta-population, through increased recreational use, potentially resulting in trampling, littering, dog fouling, unauthorised camping/campfires/barbecues.	Landscape Strategy, LMP and Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife.
		Damage to individual plants/supporting habitat, and part of plant meta-population, through inappropriate land management practices.	Landscape Strategy, LMP and Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – Appropriate management of all retained, enhanced or newly created habitats to ensure they continue to support the intended flora and fauna, and provide long term benefits to biodiversity.
		Damage to retained plants/population from changes to hydrological regime and changes in water quality/quantity.	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		<i>Special feature of interest - breeding bird assemblages:</i>	
		Damage to on-site habitats potentially used by birds from changes to hydrology; and changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).

⁸⁷ Includes only those rare plant populations listed as a reason for notification of the Swanscombe Peninsula SSSI, including divided sedge (*Carex divisa*), yellow vetchling (*Lathyrus aphaca*), slender hare's-ear (*Bupleurum tenuissimum*), Bithynian vetch (*Vicia bithynica*) and round-leaved wintergreen (*Pyrola rotundifolia subsp. maritima*). A separate assessment of potentially significant effects upon 'non-SSSI' rare plants is provided under the 'rare plants' IEF.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise⁸⁸ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bird species using the on-site habitats.</p>	<p>Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – updated bird surveys of retained and newly created habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p> <p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained scrub habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking;</p>

⁸⁸ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)
		Disturbance (human movement or activity) , to bird species, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.	Landscape Strategy, LMP and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.
		<i>Special feature of interest - invertebrate assemblages:</i>	
		Damage to on-site habitats potentially used by invertebrates from changes to hydrology ; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities.	SLS - Sensitive design and location of new lighting to minimise impacts on wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones: <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and</p> <ul style="list-style-type: none"> • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced).
Dareth Woods SSSI	National	<p>Potential damage to habitats within the designated area from traffic generated air quality impacts – subject to further investigation to determine the nature of any significant effects.</p>	<p>If significant effects are identified following further investigation, mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England.</p>
Inner Thames Marshes SSSI	National	<p><i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i></p> <p>Damage to functionally linked habitats potentially used by bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p>
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced).

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.</p>	<p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			address any residual disturbance effects on retained habitats.
West Thurrock Lagoon and Marshes SSSI	National	<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>	
		<p>Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and/or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.</p>	<p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>
Great Crabbles Wood SSSI	National	<p>Damage to habitats within the designated area from traffic generated air quality impacts. Increased disposition of N likely to result in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity with such impacts likely occurring across circa 13.6% of total SSSI area is located within 200m of the A289 whilst the woodland is reported to be in unfavourable recovering condition. Total area</p>	<p>Mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		of impact is, however, reduced given N sensitive woodland habitat is only present across a proportion of this area.	
Botany Marshes LWS	County	Damage to habitats from changes to hydrological regime, and changes in water quality/quantity.	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, potentially giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.	SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Botany Marshes LWS to remain in the following Environmental Lighting Zone: <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)
		Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff) and potential	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		increased recreational use of Swanscombe Peninsula from members of the general public.	Creation of new bird hides at key observation locations to reduce visual impact.
Ebbsfleet Marshes, Northfleet LWS	County	Potential damage to habitats within the designated area from traffic generated air quality impacts – subject to further investigation to determine the nature of any significant effects.	If significant effects are identified following further investigation, mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England.
		Damage to habitats from changes to hydrological regime and changes in water quality/quantity.	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, potentially giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.	SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Where possible, parts of Ebbsfleet Marshes, Northfleet LWS to remain in the following Environmental Lighting Zone: <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). With remaining areas (which are already subject to high levels of lighting) within: <ul style="list-style-type: none"> • Environmental Zone E3 (Typical of well inhabited rural and urban settlements). Necessary lighting to create a safe and comfortable environment without over illuminating and reducing light spill onto adjacent areas of the E2 zone.

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
			<p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>
		<p>Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).</p>	<p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p>
<p>Disused Hospital Grounds, Mabledon LWS</p>	<p>County</p>	<p>Potential damage to habitats within the designated area from traffic generated air quality impacts – subject to further investigation to determine the nature of any significant effects.</p>	<p>Mitigation measures to reduce traffic emissions to be developed and agreed with Natural England.</p>
<p>Tilbury Marshes LWS</p>	<p>County</p>	<p>Damage to habitats from changes to hydrological regime and changes in water quality/quantity.</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>
		<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.	operational shipping then those disturbance activities will be temporally ceased. Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.	SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Entire stretch of the River Thames maintained in the following Environmental Lighting Zone: <ul style="list-style-type: none"> • Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition). Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).
		Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.	mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.
Habitats/Flora			
Populations of nationally scarce plants	National	N.B. Mitigation of potential effects upon scarce plants included under Swanscombe Peninsula SSSI.	
Retained habitats ⁸⁹ (including woodland, scrub, grassland, open mosaic on previously developed land, wetlands, waterbodies and the River Ebbsfleet).	Local to County (see Baseline section)	Damage to retained habitats, through increased recreational use , potentially resulting in trampling, littering, dog fouling, unauthorised camping/campfires/barbecues.	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife.
		Damage to retained habitats through inappropriate land management practices.	LMP and EMMF (Document Reference 6.2.12.3) – Appropriate management of all retained, enhanced or newly created habitats to ensure they continue to support the intended flora and fauna, and provide long term benefits to biodiversity.
		Damage to retained habitats from changes to hydrological regime and changes in water quality/quantity.	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).

⁸⁹ Predicted impacts on retained habitats during the operation of the Proposed Development are considered applicable across the full suite of habitats retained, and are therefore considered collectively

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
Ancient woodland	County	Potential damage to habitats within the designated area from traffic generated air quality impacts .	Mitigation measures to reduce traffic emissions to be developed and agreed with Natural England.
Species			
Wintering Waterfowl and Wading Bird Assemblage	International	N.B. Assessment of potential habitat loss and disturbance effects upon wintering waterfowl and wading bird assemblage included under SPA/Ramsar Sites.	
Wintering terrestrial bird assemblage	County	Damage to on-site habitats potentially used by birds from changes to hydrology ; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Sustainable Drainage System (SuDS) – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17). SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) – updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.
		Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bird species using the on-site habitats.	SLS – Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and</p>	<ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p> <p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		entertainment facilities, including increased recreational use of retained habitats.	
Breeding Bird Assemblage	National	N.B. Impact assessment for the breeding bird assemblage included under Swanscombe Peninsula SSSI.	
Bat Assemblage	District - County	Damage to on-site habitats potentially used by bats from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bat species using the on-site habitats, including light pollution of foraging, commuting and roosting habitats.	SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones: <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced).
Dormouse	District	Damage to on-site habitats potentially used by dormice from changes to hydrology; and changes to water and /or sediment quality	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>(from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p> <p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to dormice using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SLS – Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained scrub habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>
Otter	Local	<p>Damage to on-site habitats potentially used by otters from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to otters using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems.</p>
Water Vole	Local to District	<p>Damage to on-site habitats potentially used by water voles from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to water voles using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>
Harvest Mouse	Local	<p>Damage to on-site habitats potentially used by harvest mice from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		<p>the Project Site including operational waste and pollutants).</p> <p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to harvest mice using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>
Amphibian assemblage	Local to District	Damage to on-site habitats potentially used by amphibians from changes to hydrology ; and changes to water and /or sediment quality	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		(from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Resources and Flood Risk (Document Reference 6.1.17).
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to amphibians using the on-site habitats, including light pollution of breeding, foraging and hibernation/shelter habitats.	SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones: <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced).
Reptile assemblage	District	Damage to on-site habitats potentially used by reptiles from changes to hydrology ; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).
		Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or	SLS - Sensitive design and location of new lighting to minimise impacts on wildlife. Retained grassland/scrub habitats within the Kent Project

Ecological Feature	Importance of Receptor	Nature of Impact	Summary of Avoidance/Mitigation Measures
		physiological stress to reptiles using the on-site habitats, including light pollution of potential shelter and hibernation habitats.	Site to remain in the following Environmental Lighting Zone: <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced).
Invertebrate assemblage	National	N.B. Impact assessment for the invertebrate assemblage included under Swanscombe Peninsula SSSI.	

RESIDUAL ENVIRONMENTAL EFFECTS

12.283 The residual effects are the likely effects occurring following implementation of the design measures and the construction phase and operational phase avoidance and mitigation measures described above.

12.284 Aside from those off-site measures which constitute avoidance and mitigation for indirect effects on off-site designated sites, namely effects relating to loss/disturbance of functionally linked land and those relating to recreational disturbance, all other off-site (compensatory) measures are not taken into account in determining residual effects.

12.285 The residual effects predicted to arise during construction are detailed within **Table 12.16**.

12.286 The residual effects predicted to arise during the operational phase are detailed within **Table 12.17**.

Table 12.16: Summary of ecological impact assessment and residual effects during construction phase

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
Thames Estuary and Marshes SPA/Ramsar, and the component SSSIs including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI ⁹⁰	<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>			
	Direct loss of/damage to functionally linked land on the Kent Project Site, potentially used by cited bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Significant at District level (moderate adverse) (permanent).	Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the Ecological Mitigation and Management Framework (EMMF) (Document Reference 6.2.12.3). Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).	No significant effect (potential for significant positive effect in the long term).
	Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south-east of Black	Significant at District level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect

⁹⁰ South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI are component SSSIs to the Thames Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Duck Marsh and other low-lying seasonally inundated areas); and changes to water and/or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.</p>			
	<p>Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants.</p>	<p>Significant at District level (minor adverse) (temporary).</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>techniques for demolition works, earthworks and construction.</p> <p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>	<p>No significant effect</p>
	<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>BMRS - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious construction activities then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at District level (moderate adverse) (temporary, reversible).</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>Significant at District level (moderate adverse) (temporary, reversible).</p>	<p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			– delivered in accordance with the ECF (Document Reference 6.2.12.10).	
Medway Estuary and Marshes SPA/Ramsar/SSSI ⁹¹	<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>			
	Direct loss of/damage to functionally linked land on the Kent Project Site, potentially used by cited bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Significant at District level (moderate adverse) (permanent).	Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3). Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).	No significant effect. (potential for significant positive effect in the long term).
	Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black	Significant at District level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

⁹¹ Medway Estuary and Marshes SSSI is a component SSSI to the Medway Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also. No potential impacts are identified to the SSSI that are additional or different in their nature to those identified to the SPA/Ramsar

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.</p>			
	<p>Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants.</p>	<p>Significant at District level (minor adverse) (temporary).</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			machinery/ power tools, and techniques for demolition works, earthworks and construction.	
	<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS.</p>	Significant at District level (minor adverse) (temporary, reversible).	<p>Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>	No significant effect.
	<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	Significant at District level (minor adverse) (temporary, reversible).	<p>BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	No significant effect
	<p>Disturbance (noise and lighting) associated with increased shipping traffic and</p>	Significant at District level (moderate	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>construction activities, giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>adverse) (temporary, reversible).</p>	<p>impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the</p>	

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>Significant at District level (moderate adverse) (temporary, reversible).</p>	<p>ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p> <p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10)</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			to address any residual disturbance effects on retained habitats	
Swanscombe Peninsula SSSI	Overall reduction in SSSI area, and fragmentation by the Resort.	Significant at National level (major adverse) (permanent).	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, maintenance of scrub habitats across the Peninsula to allow terrestrial bird species to disperse between habitats and maintenance of unrestricted flight path from River Thames into Black Duck Marsh via retaining and managing low-growing vegetation at northern edge of marsh. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula, delivered through the EMMF and Landscape Strategy.	Significant negative at National level.
	Damage to habitats within the designated area from changes in air quality , including from dust, construction waste and	Significant at National level (major adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a	Not significant

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>pollutants, and exhaust emissions.</p>		<p>Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/machinery/power tools, and techniques for demolition works, earthworks and construction.</p>	
<p><i>Special feature of interest - populations of rare plants</i></p>				
	<p>Direct loss of individual plants/supporting habitat, and part of plant meta-population through loss of habitat within SSSI.</p>	<p>Significant at National level (major adverse) (permanent).</p>	<p>Landscape Strategy - enhancement of retained habitats on Swanscombe Peninsula and creation of new habitats, managed via the Swanscombe Peninsula SSSI Mitigation Strategy.</p> <p>Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – and subsequent detailed strategies for the translocation of nationally scarce plants/seed bank occurring on the Kent Project Site.</p>	<p>Significant negative at National level.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Damage to retained plants from construction dust, waste and pollutants.	Significant at National level (major adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to individual plants/supporting habitat from adjacent construction works and deposition of construction materials.	Significant at National level (moderate adverse) (temporary).	CEMP and Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.	No significant effect.
	Damage to plants/their habitats from introduction or proliferation of INNS.	Significant at National level (minor adverse) (temporary).	Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – including details on control/eradication of existing populations of non-native species.	No significant effect.
<i>Special feature of interest - breeding bird assemblages:</i>				
	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at National level (major adverse) (permanent).	CEMP, and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – including sensitive timing	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			and methodology for habitat clearance, establishment of EPZs to protect retained habitats.	
	Direct habitat loss – loss of suitable habitat such as scrub, grassland, reedbed and woodland.	Significant at National level (moderate adverse) (permanent).	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) - enhancement of retained scrub habitat through rotational management to create age class and structural diversity, and maintenance of site wide open mosaic habitats to provide variety of foraging resources, managed via the EMMF.	Significant negative at National level.
	Damage to supporting habitats from changes to hydrological regime and changes to water and/or sediment quality.	Significant at National level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at National level (major adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			Dust Management Plan (DMP) to provide measures to control dust and other emissions.	
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at National level (minor adverse) (temporary).	Swanscombe Peninsula SSSI Mitigation Strategy – including details on control/eradication of existing populations of non-native species.	No significant effect.
	Habitat fragmentation, loss of flight paths and dispersal routes.	Significant at National level (moderate adverse) (permanent).	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, maintenance of scrub habitats across the Peninsula to allow terrestrial bird species to disperse between habitats and maintenance of unrestricted flight path from River Thames into Black Duck Marsh via retaining and managing low-growing vegetation at northern edge of	Significant negative at National level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			marsh. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula, delivered through the EMMF and Landscape Strategy.	
	Disturbance (from shipping/ferry movements) – as described above in relation to impacts on SPA/Ramsar sites.	Significant at National level (minor adverse) (temporary).	BMRS - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious construction activities then those disturbance activities will be temporarily ceased.	Significant negative at National level.
	Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Significant at National level (moderate adverse) (temporary).	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>	
	<p>Disturbance (human movement or activity) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>Significant at National level (moderate adverse) (temporary).</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds).</p>	<p>Significant negative at National level.</p>
<p><i>Special feature of interest - invertebrate assemblages:</i></p>				

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Direct habitat loss – loss of suitable habitat, particularly Open Mosaic Habitat on Previously Developed Land</p>	<p>Significant at National level (major adverse) (permanent).</p>	<p>Landscape Strategy, and Swanscombe Peninsula SSSI Mitigation Strategy (Invertebrates) – enhancement of existing retained open mosaic habitat (OMH) to better quality and creation of new brown roofs as described previously. Furthermore, enhancement of retained wetland habitat within Botany Marsh East and Black Duck Marsh through reduction of scrub encroachment, selective ditch re-profiling, and creation of additional scrapes and deep areas in Black Duck Marsh. Creation of additional saltmarsh habitat on the north-eastern edge of Swanscombe Peninsula through ‘retiring’ the flood defence. Creation of a number of habitats of value to invertebrates within the amenity spaces within the resort itself, including native tree and shrub planting, wildflower strips, green roofs and walls and ‘bug hotels’.</p>	<p>Significant negative at National level.</p>
	<p>Damage to habitats from changes to hydrological</p>	<p>Significant at National level (moderate adverse) (temporary).</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	regime and changes to water and/or sediment quality.		Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at National level (major adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to supporting habitats from introduction or proliferation of INNS.	Significant at National level (minor adverse) (temporary).	Swanscombe Peninsula SSSI Mitigation Strategy – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
	Habitat fragmentation.	Significant at National level (moderate adverse) (permanent).	Landscape Strategy and Swanscombe Peninsula SSSI Mitigation Strategy (Invertebrates) – retention and enhancement of large area of open mosaic habitat on	Significant negative at National level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>Significant at National level (moderate adverse) (temporary).</p>	<p>the Kent Project Site, connected to existing semi-natural habitats.</p> <p>CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p>	<p>No significant effect.</p>
<p>Darenth Woods SSSI</p>	<p>Damage to habitats within the designated area from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions.</p>	<p>Significant at National level (moderate adverse) (temporary).</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/maintenance, site monitoring, operation of vehicles/machinery/power tools, and techniques for demolition works, earthworks and construction.</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
Inner Thames Marshes SSSI	<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>			
	<p>Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).</p>	<p>No significant effect. (potential for significant positive effect in the long term subject to final off-site mitigation package).</p>
	<p>Damage to functionally linked habitats potentially used by bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and/or sediment quality (either from surface or groundwater discharges from</p>	<p>Significant at District level (moderate adverse) (temporary).</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.			
	Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants .	Significant at District level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.	No significant effect.
	Damage to functionally linked habitats potentially used by cited bird species from	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	introduction or proliferation of INNS .		control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	
	Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Significant at District level (minor adverse) (temporary, reversible).	BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required. Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats	No significant effect.
	Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited species potentially using functionally linked habitats.	Significant at District level (moderate adverse) (temporary, reversible).	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p>	
West Thurrock Lagoon and Marshes SSSI	<p><i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i></p> <p>Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by cited bird species, totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black</p>	Significant at District level (moderate adverse) (permanent).	<p>Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3).</p>	No significant effect

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Duck Marsh) to accommodate construction of the Leisure Core.		Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10).	
	Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology (as a result of drainage and infill of the CTRL wetland, swamp/wetland habitat along the east/south east of Black Duck Marsh and other low-lying seasonally inundated areas); and changes to water and /or sediment quality (either from surface or groundwater discharges from Project Site including construction waste and pollutants ; or from disruption of contaminated Thames sediments), with potential associated knock-on risk of bioaccumulation.	Significant at District level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Damage to functionally linked habitats potentially used by cited bird species from changes in air quality including from dust, construction waste and pollutants.</p>	<p>Significant at District level (minor adverse) (temporary).</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>	<p>No significant effect.</p>
	<p>Damage to functionally linked habitats potentially used by cited bird species from introduction or proliferation of INNS.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p> <p>BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>
	<p>Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving rise to displacement, behavioural changes or physiological stress to cited species potentially using functionally linked habitats.</p>	<p>Significant at District level (moderate adverse) (temporary, reversible).</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months,</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>presence on the Project Site during construction.</p>		<p>where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
Botany Marshes LWS	Damage to habitats from changes in air quality, including from dust, construction waste and pollutants.	Significant at Local level (major adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.	No significant effect.
	Damage to habitats from changes to hydrological regime (through destruction of adjoining wetland/grazing marsh), and changes in water quality/quantity.	Significant at Local level (major adverse) (permanent).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to habitats from adjacent construction works and deposition of construction materials.	Significant at Local level (moderate adverse) (temporary).	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of Ecological Protection Zones (EPZs)	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (noise and lighting) associated with construction activities, giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>where no construction vehicles/works are permitted and where no materials or site facilities may be situated.</p> <p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	<p>No significant effect.</p>
<p>Ebbsfleet Marshes, Northfleet LWS</p>	<p>Direct loss of/damage to habitat through Station Quarter South.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>Landscape Strategy – Retention of site wide open mosaic of habitats within retained parts of Swanscombe Peninsula, and creation of new constructed wetland</p>	<p>No significant effect</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Damage to habitats from changes in air quality, including from dust, construction waste and pollutants.</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>managed through the EMMF (Document Reference 6.2.12.3). CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/maintenance, site monitoring, operation of vehicles/machinery/power tools, and techniques for demolition works, earthworks and construction.</p>	<p>No significant effect.</p>
	<p>Damage to habitats from changes to hydrological regime (through destruction of habitat within flood zone of River Ebbsfleet), and changes in water quality/quantity.</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Damage to habitats from adjacent construction works and deposition of construction materials.</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.</p>	<p>No significant effect.</p>
	<p>Disturbance (noise and lighting) associated with construction activities, giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
Alkerden Lane Pit LWS	<p>Loss of part of plant and invertebrate meta-population through loss of habitat in the Kent Project Site.</p>	<p>Significant at Local level (minor adverse) (permanent).</p>	<p>Landscape Strategy - enhancement of retained habitats on Swanscombe Peninsula, managed via the EMMF (Document Reference 6.2.12.3).</p> <p>EMMF and subsequent detailed strategies for the translocation of nationally scarce plants/seed bank occurring on the Kent Project Site.</p>	<p>Significant negative at Local level.</p>
	<p>Damage to habitats from changes in air quality, including from dust, construction waste and pollutants.</p>	<p>Significant at Local level (major adverse) (temporary).</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/ maintenance, site monitoring, operation of vehicles/ machinery/ power tools, and techniques for demolition works, earthworks and construction.</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
Tilbury Marshes LWS	Direct loss of/damage to functionally linked habitats on the Kent Project Site, potentially used by cited bird species , totalling a net loss of 15.49ha, including 14.55ha of coastal and floodplain grazing marsh (Botany Marsh West) and 0.94ha of reedbeds (Black Duck Marsh) to accommodate construction of the Leisure Core.	Significant at District level (moderate adverse) (permanent).	Landscape Strategy - enhancement of retained wetland habitat on Swanscombe Peninsula and creation of new saltmarsh, wetland and reedbed habitats, managed via the EMMF (Document Reference 6.2.12.3). Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10)	No significant effect.
	Disturbance (from shipping/ferry movements) giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.	Significant at District level (minor adverse) (temporary, reversible).	BMRS - to monitor bird activity and inform the development of further control/mitigation measures as required. Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats	No significant effect.
	Disturbance (noise and lighting) associated with increased shipping traffic and construction activities, giving	Significant at District level (moderate adverse) (temporary, reversible).	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>rise to displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.</p>		<p>impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the</p>	

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (human movement or activity), to bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during construction.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p> <p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10)</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			to address any residual disturbance effects on retained habitats	
Populations of nationally scarce plants	N.B. Mitigation of potential effects upon scarce plants included under Swanscombe Peninsula SSSI.			
Broad leaved Semi Natural Woodland	Direct loss of habitat from woodland south of Black Duck Marsh – 3.84ha lost from a total of 21.37ha (18% of the existing total).	Significant at Local level (major adverse) (permanent).	Landscape Strategy - enhancement of retained habitats on Swanscombe Peninsula, managed via the EMMF (Document Reference 6.2.12.3).	Significant negative at Local level.
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
Ancient woodland	Damage to habitats within the designated area from changes in air quality, including from dust, construction waste and pollutants, and exhaust emissions.	Significant at District level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions. The CEMP will secure a suite of construction	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			mitigation measures as detailed in Chapter 16: Air Quality (Document reference 6.1.16), relating to site management/maintenance, site monitoring, operation of vehicles/machinery/power tools, and techniques for demolition works, earthworks and construction.	
Scrub	Direct loss of habitat , a total of 34.79ha lost (41.71% of the existing total)	Significant at Local level (major adverse) (permanent).	Landscape Strategy and EMMF – enhancement of retained scrub habitats and commencement of rotational management to avoid excessive encroachment and to maintain varied structure and open mosaic habitat.	Significant negative at Local level.
	Damage to habitats from adjacent construction works and deposition of construction materials in Root Protection Area (RPA).	Significant at Local level (minor adverse) (temporary). Temporary, minor magnitude and extent.	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.	No significant effect.
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			Dust Management Plan (DMP) to provide measures to control dust and other emissions.	
	Damage to habitats from introduction or proliferation of INNS .	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
Semi-improved grassland	Direct loss of habitat , 36.19ha lost (44.79% of the existing total)	Significant at Local level (major adverse) (permanent).	Landscape Strategy and EMMF – management of existing, retained habitats on Swanscombe Peninsula through commencement of rotational management to avoid excessive scrub encroachment and to maintain varied structure and open mosaic habitat, and create new opportunities for the development of species-rich wildflower grassland.	Significant negative at Local level.
	Damage to habitats from adjacent construction works	Significant at Local level (minor adverse) (temporary).	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	and deposition of construction materials.		EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.	
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to habitats from introduction or proliferation of INNS.	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
Coastal/floodplain grazing marsh	Direct loss of habitat , 13.74ha lost (100% of the existing total). All CFGM is also included under the Floodplain Wetland Mosaic grouping, within the	Significant at District level (major adverse) (permanent).	No on-site measures possible/proposed.	Significant negative at District level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	biodiversity impact calculations (Document reference 6.2, Appendix 12.2).			
Open mosaic on previously developed land	<p>Direct loss of habitat, 39.83ha lost (63.7% of the existing total), includes a range of individual habitat components including areas of bare ground, ephemeral vegetation, open grassland and patches of scrub.</p>	Significant at District level (major adverse) (permanent).	<p>Landscape Strategy, and Swanscombe Peninsula SSSI Mitigation Strategy included in the EMMF – enhancement of existing retained open mosaic habitat (OMH) through introduction of greater variety and complexity, maintaining a range of microhabitats, foodplants and nectar sources. Measures include creation of bare ground scrapes, creation of shallow pools of varying depth, creation of piles/mounds of mixed crushed and coarse concrete rubble, and creation of chalk mounds and low bunds. Furthermore, creation of brown roof habitat on new buildings using substrate (crushed concrete and chalk) originating from the Proposed Development footprint.</p>	Significant negative at District level.
	<p>Damage to habitats from adjacent construction works and deposition of construction materials.</p>	Significant at Local level (minor adverse) (temporary).	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction	No significant effect

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			vehicles/works are permitted and where no materials or site facilities may be situated.	
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect
	Damage to habitats from introduction or proliferation of INNS .	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect
Waterbodies (ponds, standing water and ditch network)	Direct loss of habitat , 2.30ha of waterbodies lost (50.79% of the existing total) and 4.7km of ditches (50.98% of the existing total). 0.22ha of lost waterbodies are also included under the Floodplain Wetland	Significant at District level (major adverse) (permanent).	Landscape Strategy - Creation of new waterbodies/wetlands on Swanscombe Peninsula, including new perimeter swale, new constructed wetland, managed	Significant negative at District level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Mosaic grouping, within the biodiversity impact calculations (Document reference 6.2.12.2, Appendix 12.2).		through the EMMF (Document Reference 6.2.12.3).	
	Damage to habitats from changes to hydrological regime (through destruction of surrounding habitats), and changes in water quality/quantity.	Significant at Local level (moderate adverse) (permanent).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to habitats from introduction or proliferation of INNS.	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	
Swamp (reedbed)	Direct loss of habitat from 13.62ha lost (41.75% of total area). 2.84ha of reedbed is also included under the OMHPDL grouping and 0.88ha under Floodplain Wetland Mosaic, within the biodiversity impact calculations (Document reference 6.2, Appendix 12.2).	Significant at County level (major adverse) (permanent).	Landscape Strategy - Creation of new waterbodies/wetlands on Swanscombe Peninsula, including new perimeter swale and new constructed wetland managed through the EMMF (Document Reference 6.2.12.3).	Significant negative at County level.
	Damage to habitats from adjacent construction works and deposition of construction materials.	Significant at Local level (minor adverse) (temporary).	CEMP and EMMF – detailing sensitive construction methodology, including set up and maintenance of EPZs where no construction vehicles/works are permitted and where no materials or site facilities may be situated.	No significant effect.
	Damage to habitats from changes to hydrological regime (through destruction of surrounding habitats), and changes in water quality/quantity.	Significant at Local level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary)	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to habitats from introduction or proliferation of INNS.	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
River Ebbsfleet	Direct loss of connected floodplain habitat within Ebbsfleet Valley, such as waterbodies and semi-improved grassland.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy - Creation of new waterbodies/wetlands on Swanscombe Peninsula, including new perimeter swale and new constructed wetland, managed through the EMMF (Document Reference 6.2.12.3).	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Damage to habitat from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to habitats from changes to hydrological regime (through destruction of surrounding habitats), and changes in water quality/quantity.	Significant at Local level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to habitats from introduction or proliferation of INNS.	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
Wintering Waterfowl and	N.B. Assessment of potential habitat loss and disturbance effects upon wintering waterfowl and wading bird assemblage included under SPA/Ramsar Sites.			

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
Wading Bird Assemblage	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at District level (major adverse) (permanent).	CEMP and SPA and Winter Bird Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including sensitive timing and methodology for habitat clearance, establishment of EPZs to protect retained habitats.	No significant effect.
Wintering terrestrial bird assemblage	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at District level (major adverse) (permanent).	CEMP and SPA and Winter Bird Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including sensitive timing and methodology for habitat clearance, establishment of EPZs to protect retained habitats.	No significant effect.
	Direct habitat loss – loss of suitable habitat such as scrub, grassland, reedbed and woodland, as detailed above.	Significant at District level (moderate adverse) (permanent).	Landscape Strategy and SPA and Winter Bird Mitigation Strategy included within EMMF - enhancement of retained scrub habitat through rotational management to create age class and structural diversity, and maintenance of site wide open mosaic habitats to provide variety of foraging resources, managed via the EMMF.	Significant negative at District level.
	Damage to functionally linked habitats from changes to hydrological regime and	Significant at District level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	changes to water and/or sediment quality – as described above in relation to impacts on SPA/Ramsar sites.		Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at District level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to functionally linked habitats from introduction or proliferation of INNS – as described above in relation to impacts on SPA/Ramsar sites.	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
	Habitat fragmentation, loss of flight paths and dispersal routes.	Significant at District level (moderate adverse) (permanent).	Landscape Strategy and EMMF (Document Reference 6.2.12.3)– maintenance of scrub habitats across the Peninsula to allow	Significant negative at District level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Disturbance (from shipping/ferry movements) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>Significant at District level (minor adverse) (temporary, reversible).</p>	<p>terrestrial bird species to disperse between habitats.</p> <p>BMRS - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious construction activities then those disturbance activities will be temporally ceased.</p>	<p>Significant negative at District level.</p>
	<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>Significant at District level (moderate adverse) (temporary, reversible).</p>	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – sensitive timing of works causing in excess of 55dB of noise at the river frontage or functionally linked habitat, to take place in summer months, where possible, as detailed in the Bird Mitigation Strategy enclosed within the EMMF (Document Reference 6.2.12.3).</p>	<p>Significant negative at District level.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p> <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p>	
	<p>Disturbance (human movement or activity) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>Significant at District level (moderate adverse) (temporary, reversible).</p>	<p>CEMP – use of site screening/hoarding; sensitive timing of works within 300m of the the river frontage or functionally linked habitat and visible from that habitat to take place in summer months, where possible; and access by construction workers to the river front restricted within 500m of visible wetland habitats, where possible; as detailed in the Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3).</p>	<p>Significant negative at District level.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.	
Breeding Bird Assemblage	N.B. Impact assessment for the breeding bird assemblage included under Swanscombe Peninsula SSSI.			
Bat Assemblage	Direct killing, injury or harm to individuals – during demolition of buildings with bat roost potential and trees with bat roost potential.	Significant at Local level (major adverse) (permanent).	CEMP , and Bat Mitigation Strategy included within EMMF (Document Reference 6.2.12.3)– including pre-commencement surveys of structures/trees to be demolished/felled, and receipt of European Protected Species Mitigation Licence (EPSML), or site registration under the Bat Mitigation Class Licensing (BMCL) scheme, prior to works commencing, with precautionary method of working (as prescribed by the license), strictly adhered to. Establishment of EPZs to protect retained habitats.	No significant effect.
	Direct loss of potential roosting habitat – including trees, buildings and structures with bat roost potential.	Significant at Local - District level (major adverse) (permanent).	Landscape Strategy and Bat Mitigation Strategy included in EMMF Document Reference 6.2.12.3)– creation of new bat roosting habitat, including bat boxes incorporated into new buildings and into the two new bird watching	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			towers, and enhancement of hibernation habitat within retained tunnels.	
	<p>Direct loss of foraging, commuting and dispersal habitats - loss of suitable foraging habitat such as scrub, grassland, reedbed and woodland, as detailed above, including potential winter foraging habitat.</p>	<p>Significant at Local level (moderate adverse) (permanent).</p>	<p>Landscape Strategy and EMMF (Document Reference 6.2.12.3) – creation/maintenance of a range of habitats including woodland, scrub, wetlands, waterbodies, reedbeds, saltmarsh and invertebrate rich habitats, collectively will maintain foraging and commuting bat population on site.</p>	<p>Significant negative at Local level.</p>
	<p>Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>	<p>No significant effect.</p>
	<p>Damage to supporting habitats from construction dust, waste and pollutants.</p>	<p>Significant at Local level (minor adverse) (temporary).</p>	<p>CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at Local level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
	Habitat fragmentation, loss of flight paths and dispersal routes.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, maintenance of scrub habitats across the Peninsula, and retention of habitat link to the River Thames to allow bats to disperse between habitats on- and off-site.	Significant negative at Local level.
	Disturbance (noise and lighting) – including on retained roosts, foraging areas and commuting routes.	Significant at Local level (moderate adverse) (temporary, reversible).	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	
<p>Dormouse</p>	<p>Direct killing, injury or harm to individuals – during vegetation clearance.</p>	<p>Significant at District level (major adverse) (permanent).</p>	<p>CEMP, and Dormouse Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement surveys of suitable dormouse habitat, and receipt of European Protected Species Mitigation Licence (EPSML) prior to habitat clearance commencing, with dormouse displacement methodologies and precautionary method of working (as prescribed by the license), strictly adhered to. Establishment of EPZs to protect retained habitats.</p>	<p>No significant effect.</p>
	<p>Direct habitat loss – loss of suitable habitat such as scrub and woodland, as detailed above.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>Landscape Strategy and Dormouse Mitigation Strategy included EMMF (Document Reference 6.2.12.3) – enhancement of existing scrub habitats to ensure habitats remain suitable for dormice, through rotational scrub management to</p>	<p>Significant negative at District level.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			improve structural and age class diversity and maintain variety of food sources throughout the dormouse active season.	
	Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Significant at District level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at District level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at District level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Habitat fragmentation and loss of dispersal routes.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p> <p>Landscape Strategy and Dormouse Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) –retention of areas of suitable habitat within Broadness grassland, including existing woodland, tree and scrub habitats; retention and management of dense bramble and low growing scrub and trees along the north western boundaries of Black Duck Marsh, to maintain potential dispersal routes from Swanscombe Peninsula to the south-west; retention and enhancement of a continuous belt of woodland habitat along the southern boundaries of Black Duck Marsh, connecting to additional green corridors proposed along the southern boundary adjacent to Tiltman Avenue, to ensure the continued functioning of existing dispersal routes to valuable off-site habitats to the south-west, including the woodland at the Swanscombe</p>	<p>Significant negative at District level.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			Heritage Park; and retention, enhancement and creation of additional woodland habitat alongside the sensitive design of new landscaping around the peripheries of Botany Marsh, necessary to further promote habitat connectivity between Swanscombe Peninsula and habitats across the wider landscape to the south.	
	Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Significant at District level (moderate adverse) (temporary, reversible).	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	No significant effect.
Otter	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at Local level (major adverse) (permanent).	CEMP , and Otter Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement surveys of suitable habitat, sensitive	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			habitat clearance methodology, and establishment of EPZs to protect retained habitats. In the event an otter holt is found within the Proposed Development footprint, a European Protected Species Mitigation Licence (EPSML) will be needed prior to habitat clearance commencing.	
	Direct habitat loss – loss of suitable habitat such as reedbed and waterbodies, as detailed above.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy - new constructed wetland, managed through the EMMF (Document Reference 6.2.12.3). Creation of two new artificial otter holts as described in the Otter Mitigation Strategy included in the EMMF.	Significant negative at Local level.
	Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Significant at Local level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	<p>Damage to supporting habitats from introduction or proliferation of INNS.</p>	<p>Significant at Local level (minor adverse) (temporary, reversible).</p>	<p>Dust Management Plan (DMP) to provide measures to control dust and other emissions.</p> <p>Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species.</p> <p>CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.</p>	<p>No significant effect.</p>
	<p>Habitat fragmentation and loss of dispersal routes.</p>	<p>Significant at Local level (moderate adverse) (permanent).</p>	<p>Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula.</p>	<p>Significant negative at Local level.</p>
	<p>Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.</p>	<p>Significant at Local level (moderate adverse) (temporary, reversible).</p>	<p>CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			<p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	
Water Vole	<p>Direct killing, injury or harm to individuals – during vegetation clearance.</p>	<p>Significant at Local level (major adverse) (permanent).</p>	<p>CEMP, and Water Vole Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement surveys of suitable habitat, establishment of suitable receptor site, and water vole relocation under licence from Natural England (granted prior to habitat clearance commencing). Establishment of EPZs to protect retained habitats.</p>	<p>No significant effect.</p>
	<p>Direct habitat loss – including 6.1km of suitable ditches and bankside habitat and reedbed (as detailed above).</p>	<p>Significant at Local level (moderate adverse) (permanent).</p>	<p>Landscape Strategy - Creation of new wetlands on Swanscombe Peninsula, as documented within the Water Vole Mitigation Strategy included within EMMF (Document Reference 6.2.12.3).</p>	<p>Significant negative at Local level.</p>
	<p>Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as</p>	<p>Significant at Local level (moderate adverse) (temporary).</p>	<p>CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined</p>	<p>No significant effect.</p>

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	described above in relation to impacts on habitats.		within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at Local level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
	Habitat fragmentation and loss of dispersal routes.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development	Significant negative at Local level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			footprint. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula.	
	Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Significant at Local level (moderate adverse) (temporary, reversible).	<p>CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	No significant effect.
Harvest Mouse	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at Local level (major adverse) (permanent).	CEMP , and Harvest Mouse Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including pre-commencement check of suitable habitat, and precautionary method of working strictly adhered to. Establishment of EPZs to protect retained habitats.	No significant effect.
	Direct habitat loss – loss of suitable habitat such as reedbed, semi-improved	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and Harvest Mouse Mitigation Strategy included within the EMMF (Document Reference 6.2.12.3) – maintenance	Significant negative at Local level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	grassland, scrub and tall ruderal, as detailed above.		of site wide open mosaic habitat including a range of habitats of value to harvest mice including rough, tussocky grassland, tall riparian/marginal/reedbed habitat with adjacent scrub to provide refuge, foraging and breeding opportunities.	
	Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Significant at Local level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at Local level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	
	Habitat fragmentation and loss of dispersal routes.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, and maintenance of scrub and rough grassland habitats across the Peninsula to allow individuals to disperse between habitats.	Significant negative at Local level.
	Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Significant at Local level (moderate adverse) (temporary, reversible).	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			and Vibration Mitigation (Document reference 6.2.15.5).	
Amphibian assemblage	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at Local level (major adverse) (permanent).	CEMP , and Amphibian Mitigation Strategy included within EMMF – including translocation of amphibians in tandem with reptile translocation, precautionary methods of working including sensitive drain down of any waterbodies to be removed, timing of works, and establishment of EPZs to protect retained habitats.	No significant effect.
	Direct habitat loss – loss of suitable habitat such as reedbed and waterbodies, as detailed above.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and Amphibian Mitigation Strategy included within EMMF - Creation of new wetlands, ditches, ponds and waterbodies on Swanscombe Peninsula, as described above in relation to water voles and otters, will also mitigate habitat loss impacts to amphibians.	Significant negative at Local level.
	Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Significant at Local level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to provide measures to control dust and other emissions.	No significant effect.
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at Local level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
	Habitat fragmentation and loss of dispersal routes.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and EMMF – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula, delivered	Significant negative at Local level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			through the EMMF and Landscape Strategy.	
	Disturbance (noise and lighting) – as described above in relation to impacts on SPA/Ramsar sites.	Significant at Local level (moderate adverse) (temporary, reversible).	<p>CEMP and SLS – Restricted working hours and sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife.</p> <p>CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).</p>	No significant effect.
Reptile assemblage	Direct killing, injury or harm to individuals – during vegetation clearance.	Significant at Local level (major adverse) (permanent).	CEMP , and Reptile Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including establishment of suitable receptor site and subsequent translocation of reptiles from construction footprint prior to vegetation clearance commencing, and precautionary methods of working. Establishment of EPZs to protect retained habitats.	No significant effect.
	Direct habitat loss – loss of suitable habitat such as semi-improved grassland, reedbed	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and Reptile Mitigation Strategy included within EMMF (Document Reference	Significant negative at Local level.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	and tall ruderal, as detailed above.		6.2.12.3) – maintenance of site wide open mosaic habitats on Swanscombe Peninsula to maintain a variety of foraging resources, breeding, basking, sheltering and hibernation habitats. Management of grassland areas to encourage development of structurally complex grassland sward with substantial ‘litter layer’ and areas of bare ground. Creation of log/brush piles and hibernaculum to provide sheltering and hibernating habitats, and grass snake breeding sites from piling arisings from grass cutting.	
	Damage to habitats from changes to hydrological regime and changes to water and/or sediment quality – as described above in relation to impacts on habitats.	Significant at Local level (moderate adverse) (temporary).	CEMP - Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy, as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
	Damage to supporting habitats from construction dust, waste and pollutants.	Significant at Local level (minor adverse) (temporary).	CEMP – including details on safe/appropriate disposal of construction waste, and pollution prevention guidelines, to be strictly adhered to. CEMP will also include a Dust Management Plan (DMP) to	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
			provide measures to control dust and other emissions.	
	Damage to supporting habitats from introduction or proliferation of INNS .	Significant at Local level (minor adverse) (temporary, reversible).	Non-native Invasive Plant Species Mitigation Strategy included within EMMF (Document Reference 6.2.12.3) – including details on control/eradication of existing populations of non-native species. CEMP – to include control measures to prevent spread of INNS and INNS impacted soils.	No significant effect.
	Habitat fragmentation and loss of dispersal routes.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy and EMMF (Document Reference 6.2.12.3) – maintenance of connectivity across the Peninsula through the inclusion of a chain of watercourses and wetland areas wrapping around the side of the Proposed Development footprint, and maintenance of scrub and rough grassland habitats across the Peninsula to allow individuals to disperse between habitats. Creation of new wetland and saltmarsh habitats on Swanscombe Peninsula.	Significant negative at Local level.
	Disturbance (noise and lighting) – as described above	Significant at Local level (moderate adverse) (temporary, reversible).	CEMP and SLS - Restricted working hours and sensitive design and location of new lighting to minimise	No significant effect.

Ecological Feature	Description of Effect	Potential Impact including Significance	Avoidance and Mitigation	Residual Effect including Significance
	in relation to impacts on SPA/Ramsar sites.		impacts on nocturnal/crepuscular wildlife. CEMP – adoption of mitigation measures to control construction noise and vibration, as described in Appendix 15.5: Construction Noise and Vibration Mitigation (Document reference 6.2.15.5).	
Invertebrate assemblage	N.B. Impact assessment for the invertebrate assemblage included under Swanscombe Peninsula SSSI.			

Table 12.17: Summary of Ecological Impact Assessment and Residual Effects During Operational Phase

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Designations				
	<i>Potential impacts within the European/Ramsar Site itself:</i>			
	Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Significant at National level (minor adverse) (permanent).	Contribution to SAMMS – proportionate financial contribution to strategic access management.	No significant effect.
	<i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i>			

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Thames Estuary and Marshes SPA/Ramsar, and the component SSSIs including South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI ⁹²	Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at the District level (moderate adverse) (temporary-permanent).	<p>Sustainable Drainage System (SuDS) – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>	No significant effect.

⁹² South Thames Estuary and Marshes SSSI and Mucking Flats and Marshes SSSI are component SSSIs to the Thames Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at the District level (minor adverse) (permanent).</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species using functionally linked habitats.</p>	<p>Significant at the District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
			<p>noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Significant at the District level (moderate adverse) (permanent).</p>	<p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Medway Estuary and Marshes SPA/Ramsar/SSSI ⁹³	<p><i>Potential impacts solely on functionally linked resources (outside of the European/Ramsar Site):</i></p> <p>Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	Significant at District level (minor adverse) (temporary-permanent).	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>	No significant effect.

⁹³ Medway Estuary and Marshes SSSI is a component SSSI to the Medway Estuary and Marshes SPA/Ramsar, with overlapping reasons for designation. Potential impacts to the SPA/Ramsar Site are therefore considered to adequately cover the designated interest features of the SSSI also

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
			<p>noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance	
Swanscombe Peninsula SSSI	Damage to habitats within the designated area from traffic generated air quality impacts resulting in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity.	Significant at National level (major adverse) (permanent).	Landscape Strategy and LMP and SSSI Mitigation Strategy – habitat management and monitoring.	No significant effect.	
	<i>Special feature of interest - populations of rare plants</i>				
	Damage to individual plants/supporting habitat, and part of plant meta-population, through increased recreational use , potentially resulting in trampling, littering, dog fouling, unauthorised camping/campfires/barbecues.	Significant at National level (moderate adverse) (temporary-permanent).	Landscape Strategy, LMP and Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife.	No significant effect.	
Damage to individual plants/supporting habitat, and part of plant meta-population, through inappropriate land management practices.	Significant at National level (moderate adverse) (temporary-permanent).	Landscape Strategy, LMP and Swanscombe Peninsula SSSI Mitigation Strategy (Rare Plants) – Appropriate management of all retained, enhanced or newly created habitats to ensure they continue to support the intended flora and fauna, and provide long term benefits to biodiversity.	No significant effect.		

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Damage to retained plants/population from changes to hydrological regime and changes in water quality/quantity.</p>	<p>Significant at National level (moderate adverse) (temporary-permanent).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>	<p>No significant effect.</p>
<i>Special feature of interest - breeding bird assemblages:</i>				
	<p>Damage to on-site habitats potentially used by birds from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>Significant at National level (moderate adverse) (temporary-permanent).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – updated bird surveys of retained and newly created habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>	<p>No significant effect.</p>

	<p>Disturbance (noise⁹⁴ and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bird species using the on-site habitats.</p>	<p>Significant at National level (moderate adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained scrub habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)</p>	<p>Significant negative at National level.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (human movement or activity), to bird species, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Significant at National level (moderate adverse) (permanent).</p>	<p>Landscape Strategy, LMP and Swanscombe Peninsula SSSI Mitigation Strategy (Breeding Birds) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p>	<p>Significant negative at National level.</p>
<p><i>Special feature of interest - invertebrate assemblages:</i></p>				
	<p>Damage to on-site habitats potentially used by invertebrates from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>Significant at National level (moderate adverse) (temporary-permanent).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>	<p>No significant effect.</p>

⁹⁴ Operational noise impacts are limited to the operational hours of the resort. Negligible impacts are expected between 23:00-0700. See Chapter 15 – Noise and Vibration (Document reference 6.1.15)

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities.	Significant at National level (minor adverse) (permanent).	SLS - Sensitive design and location of new lighting to minimise impacts on wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones: <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). 	No significant effect.
Darenth Woods SSSI	Potential damage to habitats within the designated area from traffic generated air quality impacts .	Significant at Local level (minor adverse) (temporary-permanent)	Mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England, following completion of updated AQ assessment.	No significant effect, subject to adoption of mitigation as required.
<i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i>				

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Inner Thames Marshes SSSI	Damage to functionally linked habitats potentially used by bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at District level, (moderate adverse) (temporary-permanent).	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at District level, (minor adverse) (permanent).</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats</p>	<p>No significant effect.</p>

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Significant at District level, (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
			<p>noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.</p>	<p>Significant at District level, (moderate adverse) (permanent).</p>	<p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>
<p><i>Potential impacts solely on functionally linked resources (outside of the SSSI):</i></p>				

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
West Thurrock Lagoon and Marshes SSSI	Damage to functionally linked habitats potentially used by cited bird species from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at District level (moderate adverse) (temporary-permanent).	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to cited bird species potentially using functionally linked habitats.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>BMRS – monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
			<p>noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Great Crabbles Wood SSSI	Damage to habitats within the designated area from traffic generated air quality impacts . Increased disposition of N likely to result in nutrient enrichment and acidification of qualifying woodland habitat with subsequent changes in structure and diversity with such impacts likely occurring across circa 13.6% of total SSSI area is located within 200m of the A289 whilst the woodland is reported to be in unfavourable recovering condition. Total area of impact is, however, reduced given N sensitive woodland habitat is only present across a proportion of this area.	Significant at Local level (minor adverse) (permanent).	Mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England, following completion of updated AQ assessment.	No significant effect, subject to adoption of mitigation as required.
Botany Marshes LWS	Damage to habitats from changes to hydrological regime, and changes in water quality/quantity .	Significant at Local level (moderate adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, potentially giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.</p>	<p>Significant at Local level (moderate adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Botany Marshes LWS to remain in the following Environmental Lighting Zone:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff) and potential increased recreational use of Swanscombe Peninsula from members of the general public.	Significant at Local level (minor adverse) (permanent).	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.	No significant effect.
Ebbsfleet Marshes, Northfleet LWS	Potential damage to habitats within the designated area from traffic generated air quality impacts – subject to further investigation to determine the nature of any significant effects.	Significant at Local level (minor adverse) (permanent) (on a precautionary basis, subject to further investigation).	If significant effects are identified following further investigation, mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England.	No significant effect, subject to adoption of mitigation as required.
	Damage to habitats from changes to hydrological regime and changes in water quality/quantity .	Significant at Local level (moderate adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, potentially giving rise to displacement, behavioural changes or physiological stress to wildlife species within the designated area.</p>	<p>Significant at Local level (moderate adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Where possible, parts of Ebbsfleet Marshes, Northfleet LWS to remain in the following Environmental Lighting Zone:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>With remaining areas (which are already subject to high levels of lighting) within:</p> <ul style="list-style-type: none"> • Environmental Zone E3 (Typical of well inhabited rural and urban settlements). Necessary lighting to create a safe and comfortable environment without over illuminating and reducing light spill onto adjacent areas of the E2 zone. <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
			loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).	
	Recreational disturbance of flora and fauna within designated area as a result of increased residential population (due to residential accommodation for staff).	Significant at Local level (minor adverse) (permanent).	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.	No significant effect.
Disused Hospital Grounds, Mabledon LWS	Potential damage to habitats within the designated area from traffic generated air quality impacts – subject to further investigation to determine the nature of any significant effects.	Significant at Local level (minor adverse) (permanent).	Mitigation measures to reduce traffic emissions will need to be developed and agreed with Natural England, following completion of updated AQ assessment.	No significant effect, subject to adoption of mitigation as required.
Tilbury Marshes LWS	Damage to habitats from changes to hydrological regime and changes in water quality/quantity .	Significant at Local level (moderate adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (from increased ferry movements) associated with the new Thames Clipper river bus service and operational deliveries, potentially giving rise to displacement, behavioural changes or physiological stress to bird species potentially using functionally linked habitats.</p>	<p>Significant at Local level (minor adverse) (permanent).</p>	<p>BMRS - monitoring of bird use on the intertidal habitats and other functionally linked land – if the numbers of birds within the monitored area fall below a certain threshold in response to obvious operational shipping then those disturbance activities will be temporally ceased.</p> <p>Creation/Enhancement of 259.33ha Functionally Linked Habitat Off-site – delivered in accordance with the ECF (Document Reference 6.2.12.10) to address any residual disturbance effects on retained habitats.</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to cited bird species within the designated area.</p>	<p>Significant at Local level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Entire stretch of the River Thames maintained in the following Environmental Lighting Zone:</p> <ul style="list-style-type: none"> • Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	Disturbance (human movement or activity) , to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions, and entertainment facilities.	Significant at Local level (moderate adverse) (permanent).	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.	No significant effect.
Habitats/Flora				
Populations of nationally scarce plants	N.B. Mitigation of potential effects upon scarce plants included under Swanscombe Peninsula SSSI.			
Retained habitats ⁹⁵ (including woodland, scrub, grassland, open mosaic on	Damage to retained habitats, through increased recreational use , potentially resulting in trampling, littering, dog fouling, unauthorised camping/campfires/barbecues.	Significant at Local-County level (moderate adverse) (Permanent, irreversible).	Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife.	Significant effect at Local-District level.

⁹⁵ Predicted impacts on retained habitats during the operation of the Proposed Development are considered applicable across the full suite of habitats retained, and therefore are addressed collectively

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
previously developed land, wetlands, waterbodies and the River Ebbsfleet). See Appendix 12.8 for no deterioration assessment for the River Ebbsfleet	Damage to retained habitats through inappropriate land management practices.	Significant at Local level (moderate adverse) (temporary-permanent).	LMP and EMMF (Document Reference 6.2.12.3) – Appropriate management of all retained, enhanced or newly created habitats to ensure they continue to support the intended flora and fauna, and provide long term benefits to biodiversity.	No significant effect.
	Damage to retained habitats from changes to hydrological regime and changes in water quality/quantity.	Significant at Local level (moderate adverse) (temporary-permanent)	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.
Ancient woodland	Damage to habitats within the designated area from traffic generated air quality impacts . Increased disposition of N likely to result in nutrient enrichment and acidification of woodland habitat with subsequent changes in structure and diversity.	Significant at the Local level (moderate adverse) (permanent).	Mitigation measures to reduce traffic emissions to be developed and agreed with Natural England.	No significant effect, subject to adoption of mitigation as required.
Species				
Wintering Waterfowl and Wading Bird Assemblage	N.B. Assessment of potential habitat loss and disturbance effects upon wintering waterfowl and wading bird assemblage included under SPA/Ramsar Sites.			

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
<p>Wintering terrestrial bird assemblage</p>	<p>Damage to on-site habitats potentially used by birds from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>Significant at District level (minor adverse) (temporary-permanent).</p>	<p>Sustainable Drainage System (SuDS) – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p> <p>SPA and Winter Bird Mitigation Strategy enclosed within EMMF (Document Reference 6.2.12.3) - updated bird surveys of retained and newly created wetlands and functionally linked habitats in years 3, 5 and 10 post-completion to ensure habitats continue to support the intended habitats and desired flora/fauna.</p>	<p>No significant effect.</p>

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bird species using the on-site habitats.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS – Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>BMRS – to monitor bird activity and inform the development of further control/mitigation measures as required.</p> <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate</p>	<p>Significant effect at Local level.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (human movement or activity), to cited bird species potentially using functionally linked habitats, as a result of increased human presence on the Project Site during operation of the resort rides and attractions and entertainment facilities, including increased recreational use of retained habitats.</p>	<p>Significant at District level (moderate adverse) (permanent).</p>	<p>clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15)</p> <p>Landscape Strategy, LMP and EMMF (Document Reference 6.2.12.3) – Recreational use managed via trail network, signage and interpretation boards to mitigate against knock-on effects on on-site wildlife. Creation of new bird hides at key observation locations to reduce visual impact.</p>	<p>Significant effect at Local level.</p>
<p>Breeding Bird Assemblage</p>	<p>N.B. Impact assessment for the breeding bird assemblage included under Swanscombe Peninsula SSSI.</p>			

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Bat Assemblage	Damage to on-site habitats potentially used by bats from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at District level (minor adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to bat species using the on-site habitats, including light and noise pollution of foraging, commuting and roosting habitats.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). 	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Dormouse	Damage to on-site habitats potentially used by dormice from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at Local level (minor adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to dormice using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>Significant at Local level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained scrub habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Otter	Damage to on-site habitats potentially used by otters from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at Local level (minor adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to otters using the on-site habitats, including light and noise pollution of potential foraging, dispersal and breeding habitats.</p>	<p>Significant at Local level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems.</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Water Vole	Damage to on-site habitats potentially used by otters from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at District level (minor adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to water voles using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Harvest Mouse	Damage to on-site habitats potentially used by harvest mice from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at Local level (minor adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

	<p>Disturbance (noise and lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to harvest mice using the on-site habitats, including light and noise pollution of foraging, dispersal and potential breeding/hibernating habitats.</p>	<p>Significant at Local level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). <p>Disturbance control measures – final ride design to include deliberate placement of ‘scream zones’; strict noise specification to eliminate clanking; building placement to reduce noise spread; and controls on location, direction and sound pressure level of loudspeaker systems. (See Chapter 15, Document reference: 6.1.15).</p>	<p>No significant effect.</p>
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Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Amphibian assemblage	Damage to on-site habitats potentially used by amphibians from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).	Significant at District level (minor adverse) (temporary-permanent).	SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).	No significant effect.

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
	<p>Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to amphibians using the on-site habitats, including light pollution of breeding, foraging and hibernation/shelter habitats</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on nocturnal/crepuscular wildlife. Retained intertidal and marsh habitats within the Kent Project Site to remain in the following Environmental Lighting Zones:</p> <ul style="list-style-type: none"> • River Thames and Intertidal Zone – Environmental Zone E1 (Typical of relatively uninhabited rural areas. No artificial lighting. Maintain the river in its current condition); and • Black Duck, Botany and Broadness Marshes - Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). 	<p>No significant effect.</p>

Ecological Feature	Description of effect	Potential impact including significance	Mitigation and enhancement	Residual effect including significance
Reptile assemblage	<p>Damage to on-site habitats potentially used by reptiles from changes to hydrology; and changes to water and /or sediment quality (from surface or groundwater discharges from the Project Site including operational waste and pollutants).</p>	<p>Significant at District level (minor adverse) (temporary-permanent).</p>	<p>SuDS – designed in accordance with best practice guidance as outlined within Chapter 17 – Water Resources and Flood Risk (Document Reference 6.1.17).</p>	<p>No significant effect.</p>
	<p>Disturbance (lighting) from the operation of the resort rides and attractions and entertainment facilities, giving rise to displacement, behavioural changes or physiological stress to reptiles using the on-site habitats, including light pollution of potential shelter and hibernation habitats.</p>	<p>Significant at District level (minor adverse) (permanent).</p>	<p>SLS - Sensitive design and location of new lighting to minimise impacts on wildlife. Retained grassland/scrub habitats within the Kent Project Site to remain in the following Environmental Lighting Zone:</p> <ul style="list-style-type: none"> • Environmental Zone E2 (Typical of sparsely inhabited rural areas. No lighting sources visible from animal habitats. Protect the natural areas that are to be conserved and enhanced). 	<p>No significant effect.</p>
Invertebrate assemblage	<p>N.B. Impact assessment for the invertebrate assemblage included under Swanscombe Peninsula SSSI.</p>			

COMPENSATION

12.287 As identified in the Tables above, the updated assessment has identified significant negative residual effects on a number of IEFs resulting from the construction and operational phases of the Proposed Development. In line with mitigation hierarchy, these effects should as a last resort be compensated for.

12.288 Table 12.18 summarises the IEFs which are anticipated to experience significant negative residual effects.

Table 12.18: Summary of significant negative residual effects requiring compensation

IEF(s)	Negative Effect	Level of significance
Swanscombe Peninsula SSSI	Overall reduction in area and fragmentation (construction)	National
	Direct loss of notified rare plants/supporting habitat (construction)	National
	Direct loss and fragmentation of habitat for notified breeding birds (construction)	National
	Indirect/effective loss of habitat for notified breeding birds due to disturbance from shipping movements and human activity (construction)	National
	Indirect/effective loss of habitat for notified breeding birds due to disturbance from resort rides and attractions, and increased recreational activity within retained habitat (operation)	National
	Direct loss and fragmentation of habitat for notified invertebrates (construction)	National
Alkerden Lane Pit LWS	Loss of part of plant and invertebrate meta-population through loss of habitat in the Kent Project Site	Local
Habitats	Direct loss (construction) and damage through increase recreational use (operation) of the following habitats: <ul style="list-style-type: none"> • Scrub; • Semi-improved grassland; • Coastal/floodplain grazing marsh; • Open mosaic on previously developed land; • Waterbodies (ponds, standing water and ditch network); and • Swamp (reedbed). 	Local - County
Species	Direct loss and fragmentation of habitat for the following species (construction): <ul style="list-style-type: none"> • Terrestrial wintering birds; 	Local - District

	<ul style="list-style-type: none"> • Bats (foraging); • Dormouse; • Otter; • Water Vole; • Harvest Mouse; • Amphibians; and • Reptiles. 	
	Indirect/effective loss of habitat for terrestrial wintering birds due to disturbance from shipping movements and human activity (construction)	District
	Indirect/effective loss of habitat for terrestrial wintering birds due to from resort rides and attractions, and increased recreational activity within retained habitat (operation)	Local

12.289 Proposed compensatory measures in respect of the negative residual effects identified above are set out within the Ecological Compensation Framework (ECF) (Appendix 12.10; Document Reference 6.2.12.10). In essence, direct habitat loss and indirect/effective habitat loss for species due to predicted disturbance levels are to be compensated for by the creation of new habitat, or restoration of existing habitat in poor condition, off-site, which will fulfil the same function as the habitat being lost/disturbed/damaged.

12.290 As detailed in the ECF, a precautionary approach has been taken to off-site compensation, where the quantity of new/restored habitat exceeds the quantity to be lost/disturbed/damaged.

12.291 There is considerable overlap in the nature of these negative residual effects where they apply to both habitats and the species that the habitats support. Consequently, the same off-site habitat creation/restoration measures can often meet several compensation requirements.

12.292 Additional land is still being acquired to fulfil all of the compensation requirements and achieve ecological equivalence with those habitats being loss/disturbed on site, such that further details of specific off-site land parcels will be added to the ECF as these become available.

12.293 Based solely on the off-site land which has been secured to date, the predicted net change in habitat units (as measured using a standard Biodiversity Metric) is +456.10 units (+13.61%).

CUMULATIVE AND IN-COMBINATION EFFECTS

12.294 The assessment of the Proposed Development concludes that, through the adoption of appropriate mitigation measures as detailed in the ES, the project would not give rise to

any significant negative residual effects on ecology. However, this does not exclude the potential for insignificant effects to become significant in combination with other consented/Proposed Developments and associated infrastructure within the surrounding landscape, on sensitive habitats, fauna and flora. A range of sites have been identified in the wider landscape which warrant further consideration in terms of their potential to give rise to in cumulative effects owing to their size or proximity to the Site.

12.295 **Table 12.19** below provides an assessment of those schemes identified within the 'short list' of cumulative sites set out in the Cumulative Assessment Chapter (ES Chapter 21; Document Reference 6.1.21) which were screened in as potentially capable of having cumulative impacts on ecological receptors. All other potential cumulative sites were screened out either on the basis of lying outside the ZOI of all pertinent receptors, or due to the temporal scope or scale/nature of the development proposed. The assessment has been completed following review of the ecological assessment submitted in support of the respective applications for each project as available from the relevant planning portal.

12.296 In summary, the assessment concludes that there are considered to be no significant cumulative effects in combination with the other projects evaluated.

Table 12.19 Cumulative impact assessment on ecological receptors.

ID	Application Reference	Applicant and Brief Description	Distance from Project	Status	IEFs Potentially at Risk of Cumulative Impacts	Nature of Potential Impact	Assessment	Conclusion
1	https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury2/	Tilbury2 Port Expansion by Port of Tilbury London Limited. DCO application for a new port facility acting alongside the existing Port of Tilbury. Determined by: NSIP/Planning Inspectorate.	c. 4.3km east of Kent site. c. 820 east of Essex site.	Secretary of State for Transport granted development consent for this application on 20/04/19.	Estuarine European Sites and SSSIs.	Temporary and permanent loss/disturbance of functionally linked habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield Invertebrates (local metapopulation).	Permanent loss of habitat.	Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
2	https://infrastructure.planninginspectorate.gov.uk/projects/south-east/thurrock-flexible-generation-plant/	Thurrock Flexible Generation Plant, by Thurrock Plant Ltd. Determined by: NSIP/Planning Inspectorate.	c. 4.0km east of Kent site. c. 400m east of Essex site.	Pre-examination Stage (Part 2 of Preliminary Meeting postponed to February 2021).	Estuarine European Sites and SSSIs.	Temporary and permanent loss/disturbance of functionally linked habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield Invertebrates (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
3	https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing/	Lower Thames Crossing, by Highways England. Determined by: NSIP/Planning Inspectorate.	c. 5.4km east of Kent site c. 2.6km east of Essex site.	Application withdrawn. The Applicant has not yet set a timetable for a revised application	Estuarine European Sites and SSSIs.	Temporary and permanent loss/disturbance of functionally linked habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield Invertebrates (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
4	https://infrastructure.planninginspectorate.gov.uk/projects/south-east/tilbury-energy-centre/	Tilbury Energy Centre, by RWE Generation UK plc. Determined by: NSIP/Planning Inspectorate.	c. 4.6km east of Kent site. c. 1.8km east of Essex site.	Pre-application stage. Latest update November 2018: RWE have made the decision to freeze the Tilbury Energy Centre.	Estuarine European Sites and SSSIs.	Temporary and permanent loss/disturbance of functionally linked habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield Invertebrates (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.

ID	Application Reference	Applicant and Brief Description	Distance from Project	Status	IEFs Potentially at Risk of Cumulative Impacts	Nature of Potential Impact	Assessment	Conclusion
9	16/00201/EDCCON https://publicaccess.dartford.gov.uk/online-applications/simpleSearchResults.do?action=firstPage	Eastern Quarry, Swanscombe by Barton Wilmore. A mixed-use development of up to 6250 dwellings & in addition up to 231,000 square metres of built floorspace (in total), including: Use classes A1-5, B1, D1, D2, and C1. Development also includes open space provision, highways and public transport facilities, and facilities for mooring, launching and landing watercraft. Determined by: Dartford Borough Council.	c. 1.4km south of Kent site. c. 4.6 km south west of Essex site.	Permission granted 23/01/13 A number of Reserved Matters and Discharge of Conditions applications have been submitted since permission was granted. Most recently, a discharge of conditions application was granted on 23/06/20.	Estuarine European Sites and SSSIs	Recreational disturbance	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Dormice (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield Invertebrates (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
10	https://highwaysengland.co.uk/projects/a2-bean-and-ebbsfleet-junction-improvements/	A2 Bean and Ebbsfleet Junction Improvements by Highways England. Construction of 5 new slip roads and 1 modified roundabout to connect the A2 Trunk Road to the B255 Bean North and Bean South Roundabouts and Ebbsfleet East Roundabout. Determined by: Secretary of State for Transport.	c. 2.5km south west of Kent site. c. 6.0 km south west of Essex site.	On 2 nd June 2020 Highways England received confirmation from the Secretary of State for Transport that the scheme can proceed to construction.	Darenth Wood SSSI.	Temporary and permanent air quality impacts.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Dormice (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
11	KCC/DA/0232/2019 https://www.kentplanningapplications.co.uk/Planning/Display/KCC/DA/0232/2019	Bluewater Shopping Centre by Kent County Council. Full planning application for a new tunnel (the Bean Road Tunnel) and associated road works to include bus, cycling and pedestrian access to the east of Bluewater Shopping Centre to link to the Eastern Quarry development, including tree planting at land adjacent to lake 5 and tunnel infilling. Determined by: Kent County Council.	c. 2.4km south west of Kent site. c. 6.0km south west of Essex site.	Granted with conditions 24/06/2020.	Dormice (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
14	05/00221/OUT https://publicaccess.dartford.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=DECZLBQK0000	Stone Pit II, by Barton Wilmore Planning. Development of up to 870 dwellings nad up to 1,200sq metres of built floorspace for B1(a), (b), and (c), D1 and D2, and A1-A5 uses. Development includes ancillary infrastructure and works to create ecological and natural reserves and refuge areas. Determined by: Dartford Borough Council.	c. 3.0km south west of Kent site. c. 7.4km south west of Essex site.	Permission granted 30/10/17. A discharge of conditions application was submitted and approved on 04/05/20 relating to	Estuarine European Sites and SSSIs.	Recreational disturbance.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Darenth Wood SSSI.	Temporary and permanent air quality impacts.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects	No significant cumulative effect.

ID	Application Reference	Applicant and Brief Description	Distance from Project	Status	IEFs Potentially at Risk of Cumulative Impacts	Nature of Potential Impact	Assessment	Conclusion
				condition 16 of the original permission (Ecological Mitigation Strategy).			from Proposed Development.	
18	20150155 EDC http://applications.ebbsfleetdc.org.uk/online-applications/applicationDetails.do?keyVal=NK267YHPFZZ00&activeTab=summary	Land West of Springhead Road, by Countryside Properties (UK) Ltd. Outline application for mixed use development of up to 789,550 sqm floorspace comprising employment, residential, hotel and leisure uses, supporting retail and community facilities and provision of car parking, open space, roads and infrastructure. Determined by: Ebbsfleet Development Corporation (Consulting with Gravesham Borough Council).	Adjacent to southern boundary of Kent site. c. 3.0km south west of Essex site.	Permission granted February 2016. A number of reserved matters application have been submitted since this application was approved. The most recent RM application was granted permission on 17/04/20 (EDC/19/0194). Note: this application is to be delivered in phases.	Darenth Wood SSSI.	Temporary and permanent air quality impacts.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					River Ebbsfleet.	Temporary and permanent hydrological impacts.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Dormice (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
19	EDC/18/0009 http://applications.ebbsfleetdc.org.uk/online-applications/applicationDetails.do?keyVal=P2OU7PUAFG800&activeTab=summary	Land West of Springhead Road, by Countryside Properties (UK) Ltd. Reserved matters application pursuant to application 20150155 EDC relating to the erection of 172 residential dwellings in Phase 3 of Springhead Quarter. Determined by: Ebbsfleet Development Corporation (Consulting with Gravesham Borough Council).	Adjacent to southern boundary of Kent site. c. 3.0km south west of Essex site.	Permission granted June 2018. A number of discharge of conditions and NMA applications have been submitted since this application was approved. The most recent discharge of conditions application was granted permission on 09/08/19. 7 such applications are currently awaiting a decision. The most recent of these applications is a discharge of conditions	Estuarine European Sites and SSSIs.	Recreational disturbance.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Darenth Wood SSSI.	Temporary and permanent air quality impacts.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					River Ebbsfleet.	Temporary and permanent hydrological impacts.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Dormice (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.

ID	Application Reference	Applicant and Brief Description	Distance from Project	Status	IEFs Potentially at Risk of Cumulative Impacts	Nature of Potential Impact	Assessment	Conclusion
				application validated 24/03/20 (EC/20/0046).				
27	19/01058/OUT https://regs.thurrock.gov.uk/online-applications/caseDetails.do?caseType=Application&keyVal=PUFLM8QGIZ00	Land Part of Little Thurrock Marshes, by Nordor Holdings Ltd. Outline application for 161 new dwellings and 7,650sqm of employment floorspace (B1c/B2/B8) and associated infrastructure. Determined by: Thurrock Council.	c. 1.8km north east of Kent site. c. 2.3km north west of Essex site.	Application validated 11/07/19. Determination deadline 10/10/19. Awaiting decision. Application still receiving consultee comments.	Estuarine European Sites and SSSIs. Brownfield Invertebrates (local metapopulation).	Recreational disturbance. Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development. Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect. No significant cumulative effect.
31	17/01668/OUT https://regs.thurrock.gov.uk/online-applications/applicationDetails.do?keyVal=P109FAQGKX00&activeTab=summary	Application for outline planning permission, with all matters reserved for subsequent approval, except for means of access, for mixed-use redevelopment involving the demolition of existing buildings and other structures, site preparation works, and the development of up to 2,850 dwelling houses (Use Class C3) comprising a mix of 1, 2, 3 and 4 bedroom units including affordable housing, up to 11,000 sq.m (f/s) of business uses (Use Class B1), up to 8,880 sq.m (f/s) of shops (Use Class A1), up to 5,220 sq.m (f/s) of restaurants and cafes (Use Class A3), up to 900 sq.m (f/s) drinking establishments (Use Class A4), up to 20,000 sq.m (f/s) of hotel accommodation (Use Class C1), up to 18,300 sq.m (f/s) of non-residential institutions uses, comprising a primary school, secondary school and sixth form, medical and community uses (Use Class D1), up to 6,200 sq.m (f/s) of assembly and leisure uses (Use Class D2), up to 135,000 sq.m (f/s together with external backlot production space) film and television production space including ancillary workshops, offices and post production facilities and ancillary infrastructure, together with ancillary car park, provision of temporary railway station facilities, up to 1,600 sq.m (f/s) of upgraded railway station facilities and local waste and power facilities (Sui Generis), all together with associated vehicle parking, open space, landscape and public realm provision, ecological mitigation, highways, pedestrian and vehicular access routes, and other associated engineering, utilities and infrastructure works including but not limited to,	c. 5.0km north west of Kent site. c. 9.3km north west of Essex site.	Permission granted 20/12/19. A number of reserved matters applications have been submitted related to this application. The most recent of these applications were validated in March 2020 and are awaiting determination.	Estuarine SSSIs.	Temporary and permanent loss/disturbance of functionally linked habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.

ID	Application Reference	Applicant and Brief Description	Distance from Project	Status	IEFs Potentially at Risk of Cumulative Impacts	Nature of Potential Impact	Assessment	Conclusion
		rebuilding, repairing, replacing and upgrading of river wall and flood defence wall and associated works of repair and reinstatement of the former Yara Purfleet Terminal jetty and the former Cory's Wharf jetty to facilitate the river wall and flood defence works, the provision of four grade separated railway crossings including a new bridge as part of the re-profiling and realignment of London Road. Determined by: Thurrock Council.						
33	18/01404/OUT https://regs.thurrock.gov.uk/online-applications/caseDetails.do?caseType=Application&keyVal=PFPEBQGHUX00	Outline planning permission with all matters (except for access) reserved for the demolition, phased remediation and redevelopment of 167 hectares of former Coryton Oil Refinery to provide up to 480,000 sq. m of commercial development including a Food Park (Use Class B2/B8); Energy & Waste related facilities (Use Class Sui Generis/B2/B8); A Central Hub incorporating a range of active uses (office, leisure, education, hotel and conferencing facilities) (Use Classes B1; D1; D2; C1) and ancillary retail/leisure/community facilities (Use Classes A1, A3, A4, A5, D2 & Sui Generis), as well as additional land set aside for a Rail Freight Terminal; 4.1 Hectares of Open Storage (Use Class B8); Lorry Parking Facilities; structural landscaping; car parking, new road and access facilities; vehicular crossing over Shellhaven Creek; pedestrian crossing facilities to existing and proposed estate roads; retention of existing jetties; and associated infrastructure works. Determined by: Thurrock Council.	c.14.1km north east of Kent site. c. 10.7km north east of Essex site.	Awaiting decision. Most recent consultee comment submitted April 2020.	Estuarine European Sites and SSSIs.	Temporary and permanent loss/disturbance of functionally linked habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
39	EDC/16/0004 http://applications.ebbsfleetdc.org.uk/online-applications/applicationDetails.do?keyVal=KH2EC1HP02600&activeTab=summary	Outline application for a mixed development and comprising: up to 532 Homes, up to 46,000 sq. m Employment Floorspace and a Mixed Use Neighbourhood Centre. Determined by: Ebbsfleet Development Corporation.	c. 600m east of Kent site. c. 1.9km south west of Essex site.	Approved subject to 106 08/06/18. A number of discharge of conditions applications have been submitted, the most recent of these was submitted in June 2020 and is	Estuarine European Sites and SSSIs.	Recreational disturbance.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Breeding birds (local metapopulations).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield	Temporary and	Planning policy requires	No significant

ID	Application Reference	Applicant and Brief Description	Distance from Project	Status	IEFs Potentially at Risk of Cumulative Impacts	Nature of Potential Impact	Assessment	Conclusion
				awaiting decision.	Invertebrates (local metapopulation).	permanent loss/disturbance of habitat.	scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	cumulative effect.
41	EDC/17/0038 http://applications.ebbsfleetdc.org.uk/online-applications/applicationDetails.do?keyVal=ON7TV7UA00K00&activeTab=summary	Hybrid planning application comprising: 598 residential dwellings, a two form entry primary school and for the refurbishment, change of use (for Use Classes A1/A2/A3/B1(a)/C3/D1) and demolition of the boundary wall and rear portion of the WT Henley Building. Determined by: Ebbsfleet Development Corporation.	c. 2.2km south east of Kent site. c. 1.1 south west of Essex site.	Approved subject to 106 20/03/19. There are a number of linked applications. The most recent of these applications is the submission of the Rosherville Pier Management Plan required by the S106, which is awaiting determination (EDC/20/0063).	Estuarine European Sites and SSSIs.	Recreational disturbance.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
42	EDC/17/0110 http://applications.ebbsfleetdc.org.uk/online-applications/applicationDetails.do?keyVal=OVFNE0UAKRW00&activeTab=summary	Outline planning application for residential development of up to 220 dwellings including new vehicular access to Tilman Avenue, creation of a development platform and associated works. Determined by: Ebbsfleet Development Corporation.	Adjacent to southern site boundary of Kent site. c. 4.4km west of Essex site.	Approved subject to 106 18/12/18. There are a number of linked applications. The most recent of these application is an application to modify a planning obligation, which is awaiting decision (EDC/20/0090).	Estuarine European Sites and SSSIs.	Recreational disturbance.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Breeding birds (local metapopulations).	Temporary and permanent loss/disturbance of habitat.	Legislation and planning policy require scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.
					Brownfield Invertebrates (local metapopulation).	Temporary and permanent loss/disturbance of habitat.	Planning policy requires scheme to avoid or mitigate negative impacts. No residual effects from Proposed Development.	No significant cumulative effect.

CLIMATE CHANGE

- 12.297 Potential climate change projections have been calculated for the Proposed Development and are detailed within Chapter 20: *Greenhouse gases and climate change* (Document Reference 6.1.20). In summary, the projections estimate an increase in winter and summer mean temperatures, an increase in winter mean precipitation, a decrease in summer mean precipitation, and rising sea levels.
- 12.298 Given that the valued habitats and species within the Project Site are ‘largely’ widespread and the Project Site is largely not near the edge of their ranges; the projected change in temperatures is not anticipated to result in any significant impacts on the designated site, habitat and species IEFs. However, it can reasonably be expected that some species more typically associated with continental Europe, and warmer climates, may expand their range further north and/or, in the case of migratory species, arrive in the UK earlier.
- 12.299 The projected changes in precipitation may have impacts on the aquatic habitats within the Kent Project Site, including the reedbed, grazing marsh, waterbodies and watercourse, and consequently the species associated with them, such as otter, water vole, amphibians and invertebrates. It is considered that the generous provision of greenspace within the Proposed Development, which will be managed to promote biodiversity, the large area of varied SuDs/attenuation features proposed throughout the scheme and the large buffer afforded to the watercourse corridor (with additional aquatic features incorporated within it), will provide sufficient resilience to any likely effects of future climate change.
- 12.300 Furthermore, future monitoring of the new and retained habitats within the Project Site recommended to be detailed within the LMP at Appendix 11.8 (Document Reference 6.2.11.8), and as described above in the mitigation section, will allow an opportunity for management prescriptions to be reviewed and amended to reflect any impacts as a result of climate change. This will further safeguard the habitat and species interests at the Project Site over the long term.

SUMMARY AND CONCLUSIONS

- 12.301 This chapter provides an assessment of the significance and consequences of likely ecological impacts upon identified Important Ecological Features (IEFs) arising from the Proposed Development for the London Resort. It has been prepared to accompany a DCO application for the Project Site.
- 12.302 A suite of impact avoidance, mitigation and compensation measures have been prepared as part of a holistic ecology and landscape strategy for the Proposed Development, to address any likely significant effects that may arise during construction and after completion (operation) of the Proposed Development. Additional measures to mitigate and compensate for potentially significant effects have been provided.

12.303 Further baseline information in support of this chapter is included within Appendix 12.1: *Ecology Baseline Report* (Document Reference 6.2.12.1) and is referred to throughout the assessment. The approach taken in this assessment is made with reference to the guidelines published in 2018 by the Chartered Institute of Ecology and Environmental Management (CIEEM)⁹⁶.

12.304 The baseline survey work, and consultation with statutory and non-statutory consultees, has identified the following IEFs pertinent to the Proposed Development:

Designated Sites

- Thames Estuary and Marshes SPA/Ramsar;
- Medway Estuary and Marshes SPA/Ramsar/SSSI;
- North Downs Woodland SAC;
- Darenth Woods SSSI;
- Inner Thames Marshes SSSI;
- South Thames Estuary and Marshes SSSI;
- West Thurrock Lagoon and Marshes SSSI;
- Mucking Flats and Marshes SSSI
- Wouldham to Detling Escarpment SSSI;
- Botany Marshes LWS;
- Ebbsfleet Marshes, Northfleet LWS;
- Alkerden Lane Pit LWS; and
- Tilbury Marshes LWS.

Habitats/Flora

- Rare plants;
- Broad leaved Semi Natural Woodland;

⁹⁶ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

- Ancient woodland;
- Scrub;
- Semi-improved grassland;
- Coastal/Floodplain Grazing Marsh;
- Open mosaic on previously developed land;
- Waterbodies (ponds, standing water and ditches);
- Swamp (reedbed); and
- River Ebbsfleet.

Species

- Wintering waterfowl and wading bird assemblage;
- Wintering terrestrial bird assemblage;
- Breeding bird assemblage;
- Bat assemblage;
- Dormouse;
- Otter;
- Water vole;
- Harvest mouse;
- Amphibian assemblage;
- Reptile assemblage; and
- Invertebrates.

12.305 The impact assessment has identified that certain actions could result in significant negative impacts on these IEFs without mitigation. Inherent avoidance and mitigation measures and the implementation of an *Ecological Mitigation and Management Framework* (Document Reference 6.2.12.3), which will be secured as a requirement of the

DCO, including construction methods statements and long-term habitat management principles, are considered to ameliorate to some degree those significant impacts identified.

- 12.306 Despite the proposed avoidance and mitigation measures, the updated assessment has identified significant negative residual effects on a number of IEFs resulting from the construction and operational phases of the Proposed Development. In line with mitigation hierarchy, these effects should as a last resort be compensated for. Proposed compensatory measures in respect of these negative residual effects are set out within the Ecological Compensation Framework (ECF) (Appendix 12.10; Document Reference 6.2.12.10).
- 12.307 In essence, direct habitat loss and indirect/effective habitat loss for species due to predicted disturbance levels are to be compensated for by the creation of new habitat, or restoration of existing habitat in poor condition, off-site which will fulfil the same function as the habitat being lost/disturbed/damaged. As detailed in the ECF, a precautionary approach has been taken to off-site compensation, where the quantity of new/restored habitat exceeds the quantity to be lost/disturbed/damaged.
- 12.308 There is considerable overlap in the nature of these negative residual effects where they apply to both habitats and the species that the habitats support. Consequently, the same off-site habitat creation/restoration measures can often meet several compensation requirements.
- 12.309 Additional land is still being acquired to fulfil all of the compensation requirements and achieve ecological equivalence with those habitats being loss/disturbed on site, such that further details of specific off-site land parcels will be added to the ECF as these become available.
- 12.310 Based solely on the off-site land which has been secured to date, the predicted net change in habitat units (as measured using a standard Biodiversity Metric) is +456.10 units (+13.61%).
- 12.311 Overall, it is considered that the Proposed Development is capable of achieving a range of positive residual effects and compensating for those residual effects, which cannot be avoided or mitigated.