

National Grid Cable Tunnel Replacement Project

Environmental Statement Volume III

Chapter 7 Biodiversity - Tilbury

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Quality information

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7 Biodiversity

7.1 Introduction

- 7.1.1 This chapter assesses the likely significant effects of the Tilbury to Grain and Tilbury to Kingsnorth (TKRE) Cable Tunnel Replacement Project (“the Proposed Development”) on Important Ecological Features¹ (IEFs) at the Tilbury Site. It considers the likely effects on ecological receptors during the construction, and operational phases.
- 7.1.2 This chapter also identifies any measures to avoid or reduce likely adverse effects on ecology arising from the Proposed Development, and where appropriate compensation for those residual impacts that cannot be avoided.
- 7.1.3 This chapter should be read together with the introductory chapters of this Environmental Statement (ES) (ES Volume II Chapters 1 – 6). Details of the effects of the Proposed Development on IEF’s at the Gravesend Site can be found in ES Volume IV Chapter 15.
- 7.1.4 The ecological assessment has been informed by the design drawings for the Proposed Development and data from other technical chapters, in particular the following comprising:
- Chapter 8: Landscape and Visual;
 - Chapter 11: Noise and Vibration;
 - Chapter 12: Air Quality; and
 - Chapter 13: Water Environment.
- 7.1.5 This chapter is supported by the following appendices (ES Volume VI) and figures:
- Appendix 7.1: Preliminary Ecological Appraisal (PEA);
 - Appendix 7.2: Ornithology Baseline Report;
 - Appendix 7.3: Great Crested Newt (GCN) eDNA Report;
 - Appendix 7.4: Bat Survey Report;
 - Appendix 7.5: Otter and Water Vole Survey Report;
 - Appendix 7.6: Badger Survey Report (Confidential);
 - Appendix 7.7: Reptile Survey Report;
 - Appendix 7.8: Invertebrate Survey Report;
 - Appendix 7.9: National Vegetation Classification / Habitat Condition Assessment Survey;
 - Appendix 7.10: Marine Assessment Screening;
 - Figure 7-1: Designated Sites for Nature Conservation;
 - Figure 7-2: Phase 1 habitat map;
 - Figure 7-3: Distribution of Tall Fescue Dominated Habitat; and
 - Figure 7-4: Ecological Mitigation Measures.
- 7.1.6 This chapter has also been supported by a Report to Inform Habitat Regulations Assessment (HRA) Test of Likely Significant Effects and Biodiversity Net Gain (BNG) Assessment and Strategy Report which accompany the planning applications.

¹ As defined in Chapter 4 of the Chartered Institute of Ecology and Environmental Management’s Guidelines for Ecological Impact in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. [ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf \(cieem.net\)](https://cieem.net/publications/ecia-guidelines-2018-terrestrial-freshwater-coastal-and-marine-v1.2-april-22-compressed.pdf) Accessed 27/09/23

7.2 Relevant Legislation, Policy and Guidance

Introduction

7.2.1 The section of this chapter provides an overview of the relevant legislation, planning policy and technical guidance relevant to the ecological assessment.

Legislation

- 7.2.2 The following pieces of legislation apply specifically to the ecological assessment:
- Wildlife and Countryside Act (WCA) 1981 (as amended) (Ref 7-1);
 - Countryside and Rights of Way (CROW) Act 2000 (as amended) (Ref 7-2);
 - Natural Environment and Rural Communities (NERC) Act 2006 (as amended) (Ref 7-3);
 - The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) (Ref 7-4);
 - The Environment Act 2021 (Ref 7-5);
 - Protection of Badgers Act 1992 (as amended) (Ref 7-6);
 - The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD) (Ref 7-7);
 - Animal Welfare Act 2006 (Ref 7-8); and
 - Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (Ref 7-9).

National Policy

7.2.3 National Planning Policy relevant to this ecological assessment are detailed in Table 7-1..

Table 7-1: National Planning Policy

Policy Reference	Relevant Policy and Context
National Planning Policy Framework (2023) (Ref 7-10) – Paragraphs 174, 175 & 179	Paragraph 174 states that planning policies and decisions should contribute to and enhance the natural and local environment through a number of means including: <i>‘minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures’;</i> Paragraph 175 states that “Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.” Paragraph 179 states that “To protect and enhance biodiversity and geodiversity, plans should: <i>a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and</i>

Policy Reference	Relevant Policy and Context
	<i>b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity”.</i> Paragraph 180 states that “When determining planning applications, local planning authorities should apply the following principles: <i>a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;</i> <i>b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;</i> <i>c) 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; and</i> <i>d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.”</i>
Environment Act (2021) Schedule 14 (Ref 7-5)	Schedule 14 makes provision for grants of planning permission in England to be subject to a condition to secure biodiversity net gain (BNG). Schedule 14 will only apply when relevant secondary legislation is in place. It is currently expected that majority of projects consented under the Town and Country Planning Act 1990 (Ref 7-11) will be required to deliver 10% BNG from January 2024 onwards (Ref 7-12).
Overarching National Policy Statement (NPS) EN-1 Section 5.3 Biodiversity and Geological Conservation (Ref 7-13)	The 2011 versions of the National Policy Statements remain in force until the revised NPS are designated in early 2024. Paragraphs 5.3.3 to 5.3.9 mirror the requirements in the NPPF to consider effects on designated sites, protected species and habitats. In addition, advocating application of the mitigation hierarchy, in particular seeking to avoid impacts on SSSI's. Paragraph 5.3.13 promotes due consideration of Local Nature Reserves and Local Sites. However, states that given the need for new infrastructure, these designations should not be used in themselves to refuse development consent. Paragraph 5.3.15 – Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, the IPC should maximise such opportunities in and around developments, using requirements or planning obligations where appropriate. Paragraph 5.3.17 – The IPC should refuse consent where harm to habitats and species of principal importance would result, unless the benefits (including the need) of the development outweigh that harm. Paragraph 5.3.18 – The applicant should include appropriate mitigation measures as an integral part of the proposed development.

Policy Reference	Relevant Policy and Context
National Policy Statement for Electricity Networks Infrastructure (EN5) (Ref 7-14)	Paragraph 2.7.2 – The applicant will need to consider whether proposed overhead lines will cause problems for large birds such as swans and geese colliding with overhead lines.
Overarching National Policy Statement for Energy (EN-1) (November 2023) (Ref 7-15)	The 2023 versions of the National Policy Statements come into force in early 2024. Paragraph 5.4.8 mirrors the protections in the NPPF, and presumes against development within SSSIs except where the benefits (including need) of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs Paragraph 5.4.21 – states that the design process should embed opportunities for nature inclusive design, seeking Biodiversity Net Gain and wider environmental gains. The scope of potential gains will be dependent on the type, scale, and location of each project. Paragraph 4.2.9 to Paragraph 4.2.13 – Before submitting an application applicants should seek the views of the Statutory Nature Conservation Body to determine if an Appropriate Assessment under the Habitat Regulations is required. Para 5.4.41 – states that developments should consider the mitigation hierarchy and consider reasonable alternatives. Where significant harm cannot be avoided, impacts should be mitigated and as a last resort, appropriate compensation measures should be sought.
National Policy Statement for Electricity Networks Infrastructure (EN-5) (November 2023) (Ref 7-16)	The 2023 versions of the National Policy Statements come into force in early 2024. Paragraph 2.8.1 – notes that when planning and evaluating the proposed development's contribution to environmental and biodiversity net gain opportunities to reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows should be considered.

Local Planning Policy

7.2.4 Local Planning Policies relevant to this ecological assessment are detailed in Table 7-2.

Table 7-2: Local Planning Policy

Policy Reference	Policy Context
Thurrock Council Core Strategy (Ref 7-17) Policy SS011	To sustain and enhance the open character of the Green Belt in Thurrock and only allow development in very special circumstances.
Thurrock Council Core Strategy - Policy SS012	Protect and enhance the natural, historic and built environment including biodiversity, landscape character, Conservation Areas, Listed Buildings, Scheduled Monuments and other heritage assets and open space through positive improvement.
Thurrock Borough Council Local Plan (2015) – Policy SS013	Develop the Greengrid network of biodiversity sites, historic sites, green infrastructure and open spaces linking existing and new communities, the urban areas to countryside and access to the river. Provide new open spaces, improve the accessibility of existing open spaces and ensure safe connecting routes and corridors linking them.

Policy Reference	Policy Context
Thurrock Council Core Strategy (2015) – Policy SS019	To safeguard and enhance the Thurrock riverside and coastal land for its various roles as a key asset of the Borough: including its value for wildlife.
Thurrock Council Core Strategy – Policy CSTP18 – Green Infrastructure	The policy seeks to ensure that the Council and its partners will ‘<i>restore, protect, enhance and where appropriate create its green assets.</i>’ In addition, it states that ‘<i>The Council will require a net gain in Green Infrastructure. This will contribute to addressing the existing and developing deficiencies, ensuring connectivity and relieving pressure on designated biodiversity sites such as SSSI’s</i>’, and that development should seek opportunity to increase green infrastructure including ‘<i>incorporation of features such as green roofs, green walls and other habitat/wildlife creation and also innovative technology.</i>’
Thurrock Council Core Strategy – Policy CSTP19 Biodiversity	Development will be encouraged to include measures to contribute positively to the overall biodiversity in the Borough, including safeguarding and enhancing the existing network of designated sites. The Council will ensure that all designated sites are managed appropriately and will prepare suitable Biodiversity Management Plans, with partners, to demonstrate how positive management will be achieved. The Council will promote small-scale biodiversity interventions such as green roofs. “
Thurrock Council Core Strategy – Policy PMD7 – Biodiversity, Geological Conservation and Development.	The policy states that development affecting locally designated sites or significant biodiversity habitat will only be permitted where it can be demonstrated that retention is not possible and that there is no alternative. Where this is the case, the developer is required to set out why the loss is unavoidable and how the impacts would be mitigated or compensated. Where it is necessary to secure the biodiversity or geological interest of a development site, the Council will seek the provision and implementation of a Biodiversity or Geological Management through planning obligations.

Guidance

7.2.5 This ecological assessment has been carried out taking into account the following guidance:

- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (Ref 7-18);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines – Third Edition (Ref 7-19);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines – Fourth Edition (Ref 7-20);
- Green Roofs for Invertebrates : A Best Practice Guide (Ref 7-21);
- Biodiversity Metric 4.0 – User Guide (Ref 7-22).

7.3 Scope and Methodology

Study Area/Zone of Influence

- 7.3.1 The assessment of the likely significant effects on biodiversity has included an assessment of IEFs with the potential to be directly or indirectly affected by the Proposed Development.
- 7.3.2 Based on the nature of the Proposed Development, the potential for impacts on the following biodiversity resources/receptors were considered as part of the assessment:
- Statutory and non-statutory sites designated for nature conservation value within 2km (10km for The National Site Network²);
 - Legally protected or otherwise notable species at the Site or within 2km (5km radius for bat species); and
 - Habitats or features within or adjacent to the Site based on the likely zone of influence of the Proposed Development for each IEF, and an understanding of the maximum distances typically considered by statutory consultees.

Scope and Assessment Methodology

- 7.3.3 This assessment considers the potential impacts of the Proposed Development at the Tilbury Site taking into account the proposed design and programme set out in ES Volume II Chapter 3 Project Description. The assessment considers both the impacts during construction and when the Proposed Development is operational.
- 7.3.4 The potential impacts of the Proposed Development at the Gravesend Site are described separately in ES Volume IV Chapter 15.

The baseline for the assessment is considered based on current site conditions, drawing upon information collected during field surveys undertaken between October 2022 and September 2023, and other relevant pre-existing information from previous surveys undertaken at the Tilbury Site including information collected by National Highways (in support of Lower Thames Crossing) (Ref 7-24); Thurrock Power Limited (in support of Thurrock Flexible Generation Plant) (Ref 7-25), and Natural England (Ref 7-26 Bioscan (2021) Land at the Former Tilbury Power Station: Tilbury 3: Temporary Use of Land For Port-Related Storage – Ecological Appraisal November 2021 Available at https://regs.thurrock.gov.uk/online-applications/files/CAC2F3238A203CAD43D932A0A07E81B5/pdf/21_01927_FUL-ECOLOGICAL_APPRAISAL-754664.pdf

- 7.3.5 Ref 7-27; Ref 7-28; Ref 7-29; Ref 7-30).

Impact Assessment Method

- 7.3.6 The biodiversity assessment has been undertaken in accordance with the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref 7-18). The aims of the ecological assessment are to:
- identify Important Ecological Features (IEFs) (i.e., designated sites, habitats, species or ecosystems) which may be impacted by the Proposed Development;
 - provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be positive or negative;
 - facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to biodiversity and biodiversity conservation, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and

² i.e., Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites.

- set out what steps will be taken to adhere to legal requirements relating to the relevant ecological features concerned.

7.3.7 The principal steps involved in the CIEEM approach (Ref 7-18) can be summarised as:

- Ecological features that are both present and might be affected by the Proposed Development are identified (both those likely to be present at the time works begin and those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- The importance of the identified ecological features is evaluated, placing their relative biodiversity conservation importance into geographic context, which is then used to define the relevant biodiversity features that need to be considered further;
- The changes or perturbations predicted to result as a consequence of the Proposed Development (i.e., the potential impacts) and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- The likely effects (positive or negative) on relevant ecological features are then assessed, and where possible quantified;
- Measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines) and if necessary, measures to compensate for effects on features of biodiversity conservation importance are also included;
- Any residual effects of the Proposed Development are reported;
- Scope for ecological enhancement is considered.

7.3.8 It is not necessary in the assessment to address all habitats and species with potential to occur in the relevant study area and instead the focus is on those that are “relevant” i.e., ecological features that are considered to be important and potentially affected by the Proposed Development. The CIEEM guidelines (Ref 7-18) makes clear that there is no need to “carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable”. This does not mean that efforts should not be made to safeguard wider biodiversity and requirements for this have been considered. National and local planning policy documents emphasise the need to achieve net gains for nature and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution. These considerations have been applied to the assessment method in this chapter.

7.3.9 Following assessment utilising the CIEEM methodology, in order to enable the results of the ecological assessment to be compared with those from other chapters of the ES, the residual impacts have been equated to the comparable significance criteria that are utilised within other chapters of this ES.

7.3.10 Embedded mitigation measures have been developed and outlined within the Outline CEMP (and inform required protected species licences). Following this each key ecological receptor would be evaluated to determine whether there are any effects and whether mitigation is required to reduce the significance of the effect.

Determining Importance of Ecological Features

7.3.11 Data received through consultation, desk-based assessments and field-based investigations were used to allow the importance of ecological features (including designated sites, ecosystems, habitat and species) of value (or potential value) to be identified, and the main factors contributing to their value described and related to available guidance. Each ecological feature or resource has then been subject to evaluation to assign a level of importance (or potential importance) within a defined geographical context using the following geographic scales of reference:

- International (i.e., European);
- National (i.e., England);
- Regional (i.e., South East England);
- County (i.e., Essex);
- District (i.e., Thurrock);
- Local (e.g., Tilbury);
- Site; and
- Negligible (used where the value is lower than the site level).

7.3.12 The value of relevant ecological features is based on consideration of their intrinsic and potential ecological importance and does not include consideration of social and economic values.

7.3.13 For the purposes of the assessment within this chapter, only ecological features of at least Local importance are considered as IEFs that require assessment for potential significant effects.

Characterising Ecological Impacts and Effects

7.3.14 In accordance with the CIEEM guidelines the terminology used within the Ecological Impact Assessment (EclA) draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EclA, these terms are defined as follows:

- Impact – Actions resulting in changes to an ecological feature. For example, demolition activities leading to the removal of a building utilised as a bat roost.
- Effect – Outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature. For example, killing/injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

7.3.15 Potential impacts (and where relevant resultant effects) have been characterised as follows:

- Beneficial/adverse – is the impact likely to be positive or negative;
- Magnitude – the 'size' or 'amount' of an impact – this is determined on a quantitative basis where possible;
- Spatial extent – the area or distance over which the impact occurs;
- Duration – the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. For the purposes of this assessment the following categories are utilised where relevant: short-term (up to 1 year), medium-term (1-5 years), long term (more than 5 years) and permanent. The duration of an effect may be longer than the duration of an activity or impact;
- Reversibility – is the impact temporary or permanent. A reversible (temporary) impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable; and
- Timing and frequency – consideration of the point at which the impact occurs in relation to critical life-stages or seasons.

Significance Criteria

7.3.16 For each ecological feature, only those characteristics relevant to understanding the ecological effect of the Proposed Development and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- Not significant – no effect on structure and function, or conservation status; and

- Significant – structure and function, or conservation status is affected.

7.3.17 The CIEEM guidelines (Ref 7-18) state that:

‘For the purposes of EclA a ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ (i.e., relevant ecological features) or for biodiversity in general’.....

In broad terms, 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).

7.3.18 For designated sites, the assessment has considered how the proposed development is likely to affect the conservation objectives for the site and/or its interest/qualifying features. For ecosystems, consideration is given to if the proposals are likely to result in a change in ecosystem structure and/or function.

7.3.19 For species and habitats the effects of impacts on individual habitats and species are considered in relation to ‘conservation status’ which is defined in the CIEEM guidelines as follows:

- For 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;*
- For 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.*

7.3.20 In considering effects on conservation status, reference has been made to relevant available guidance on the existing conservation status of the feature. Such judgements are based, wherever possible, on quantitative evidence. However, where necessary the professional judgement of an experienced ecologist has been applied.

7.3.21 For those effects considered significant, the effect has also been characterised as appropriate (e.g., adverse or beneficial), and qualified with reference to the geographic scale at which the effect is significant (e.g., an adverse effect significant at a national level). The output is dependent on both the characteristics and magnitude of the impact and the value of the feature concerned. For example, an affected feature that, as a whole, is of national value may be subject to effects that only affect that feature at a local-scale, and do not affect it at a national level.

7.3.22 In order to provide consistency of terminology in the conclusions of the assessment, the residual effects of the Proposed Development have been translated to a significance level on a scale of negligible, minor, moderate and major comparable to that used in the other assessments reported within this ES, as outlined in Table 7-3. These conclusions have been provided in each case in brackets following the equivalent CIEEM assessment conclusion.

Table 7-3: Relating CIEEM Assessment to Terminology Used in Other Chapters

Effect significance terminology used in other ES chapters		Equivalent CIEEM assessment
Significant (Beneficial)	Major Beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
	Moderate Beneficial	Beneficial effect on structure/function or conservation status at County or District level.
Not significant	Minor Beneficial	Beneficial effect on structure/function or conservation status at Site or local level.
	Negligible	No effect on structure/function or conservation status.
	Minor Adverse	Adverse effect on structure or conservation status at Site – local level

Effect significance terminology used in other ES chapters		Equivalent CIEEM assessment
Significant (Adverse)	Moderate Adverse	Adverse effect on structure/function or conservation status at County or District level.
	Major Adverse	Adverse effect on structure/function or conservation status at regional, national or international level

Establishing Baseline Conditions

Desk Study

- 7.3.23 A desk study was carried out to identify nature conservation designations and protected and notable habitats and species potentially relevant to the Proposed Development including scheduled invasive non-native species.
- 7.3.24 The study area used for the desk study is defined in Paragraphs 7.3.1 to 7.3.2 of this chapter.
- 7.3.25 Desk study sources are summarised in Table 7-4.

Table 7-4: Desk Study Sources

Data Source	Date Obtained/ Reviewed	Data Requested
Multi-Agency Geographic Information for the Countryside (MAGIC) website	November 2023	International statutory designations within 10 km of the Site. Other statutory designations within 2 km. Ancient woodlands and notable habitats within 500m of the Site. Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints.
Essex Field Club	December 2022	Statutory and Non-statutory designations within 1 km of the Site Protected and notable species records within 1 km of the Site (records for the last 10 years only).
Publicly available aerial photography	December 2022	Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints.
Lower Thames Crossing Development Consent Order application documents (Ref 7-24)	November 2023	Review of publicly available information documenting surveys of protected and/or notable species and habitats undertaken in support of DCO application (undergoing examination) which adjoins the Proposed Development.
Thurrock Flexible Generation Plant DCO application documents (Ref 7-25)	November 2023	Review of publicly available information documenting surveys of protected and/or notable species and habitats undertaken in support of consented DCO scheme which adjoins/partially overlaps the Proposed Development.
Tilbury 2 DCO application documents (Ref 7-23)	November 2023	Review of publicly available information documenting surveys of protected and/or notable species and habitats undertaken in support of consented DCO scheme which adjoins the Proposed Development.

Data Source	Date Obtained/ Reviewed	Data Requested
Land at Former Tilbury Power Station: Temporary use of Land for Port Related Storage - Ecological Appraisal (Ref 7-26)	November 2023	Review of publicly available information documenting surveys of protected and/or notable species and habitats undertaken in support of consented external storage application
Natural England Access to Evidence	November 2023	Review of the following documents for information relevant to the baseline for the Proposed Development: - NECR494 North Thames Estuary and Marshes Vascular Plant and Charophyte Survey 2022³; (Ref 7-26 Bioscan (2021) Land at the Former Tilbury Power Station: Tilbury 3: Temporary Use of Land For Port-Related Storage – Ecological Appraisal November 2021 Available at https://regs.thurrock.gov.uk/online-applications/files/CAC2F3238A203CAD43D932A0A07E81B5/pdf/21_01927_FUL-ECOLOGICAL_APPRAISAL-754664.pdf - Ref 7-27) - NECR469 Tilbury Fort Marshes Terrestrial Invertebrate Survey Report 2022 (Ref 7-28 - NECR473 North Thames Estuary and Marshes – LTC4 area Terrestrial Invertebrate Survey (Ref 7-29) - NECR472 North Thames Estuary and Marshes Breeding Birds report (Ref 7-30)

Field Surveys

A series of habitat and species surveys commenced in October 2022 and concluded in September 2023 as set out in Table 7-5. Survey methods were based upon Natural England standing advice (Ref 7-31) and CIEEM best practice guidance for protected species and habitats (Ref 7-18).

- 7.3.26 A Preliminary Ecological Appraisal was produced in January 2023 (survey undertaken in November 2022) (Volume VI – Appendix 7.1) in support of an initial options appraisal, as a consequence covered a larger area than will be impacted by the proposals.

Limitations

- 7.3.27 Details of limitations (e.g., weather conditions, health and safety considerations) that may have affected the outcome of individual survey visits are provided within the accompanying baseline appendices (Volume VI – Appendix 7.1 to Appendix 7.10). As detailed within the baseline survey reports these constraints have been taken into account when interpreting the survey results and where appropriate a precautionary approach has been taken when assigning importance values to ecological features, with a 'reasonable worst case' importance rating assigned, based both the 2023 field survey data and other available data for the Site.
- 7.3.28 Based on this approach, there is confidence that the outputs of the ecological assessment provide a robust assessment, enabling all likely significant effects of the Proposed Development at the Tilbury Site to be robustly identified.

Biodiversity Net Gain

³ [NECR494 North Thames Estuary and Marshes Vascular Plant and Charophyte Survey 2022 - NECR494 \(naturalengland.org.uk\)](https://naturalengland.org.uk/NECR494-North-Thames-Estuary-and-Marshes-Vascular-Plant-and-Charophyte-Survey-2022)

Biodiversity Net Gain

- 7.3.29 A Biodiversity Net Gain Assessment for the Proposed Development as a whole (i.e. both the Tilbury and Gravesend Sites combined) has been undertaken utilising Natural England's Biodiversity Metric 4.0 (Ref 7-31Ref 7-31) and is reported separately within the accompanying Biodiversity Net Gain Assessment and Strategy.
- 7.3.30 National Grid are committed to ensuring that the Proposed Development achieves a BNG of 10-15%.

Table 7-5: Protected Species and Habitat Surveys

Survey Type and relevant technical appendix)	Scope and Method	Survey Period	Survey Extent
Extended Phase 1 Habitat Survey (Volume VI Appendix 7.1)	An extended Phase 1 Habitat Survey and an appraisal of the potential suitability of the habitats present to support protected and notable species and invasive species was undertaken on 17 and 25 November 2023. The Phase 1 Habitat Survey was undertaken in accordance with the standard survey methods (Ref 7-47) It involved categorising the different habitat types and habitat features within the survey area. The information gained from the survey was used to determine the likely ecological value of the Site, and to direct any more specific survey work required.	November 2022 with updates September 2023	November 2022 survey covered the Tilbury and Gravesend Sites and a much larger area to the East as part of an initial options analysis. September 2023 updates covered minor updates to Ste boundary associated with access routes.
National Vegetation Classification (NVC) Survey (Volume VI Appendix 7.9)	NVC survey was undertaken at the Tilbury Site on 21 August 2023 to characterise the habitats present and identify the extent of homogenous habitats. Results were used to identify closest affinities to the communities described in the NVC manuals. The NVC survey was supplemented by a structured walk through the area to assess the overall abundance and distribution of any protected and/or notable species.	August 2023	Fields of grassland and reedbed directly to the north and south of the proposed Tilbury Sealing End Compound (SEC)
Intertidal Birds (Volume VI Appendix 7.2)	Between October 2022 and March 2023, the following surveys were undertaken at each Site: - Monthly high water roost count covering adjacent intertidal mudflat habitat; and - Monthly low water feeding count covering adjacent intertidal mudflat habitat. For intertidal surveys, at high water all areas were visited sequentially, and a single count of all species present undertaken within the two-hour period either side of high water. At low water all areas were visited sequentially and counts of waterbirds feeding on the intertidal mud undertaken, with birds and their numbers recorded on both the rising and falling tide, where possible. Subsequently visits at each Site using the same methodologies were undertaken in June, July and August 2023 to assess usage of the same areas of intertidal habitat by protected/notable species during the breeding season.	October 2022 – March 2023 and June to August 2023.	Intertidal surveys extended 200m east and west of the sections of foreshore adjoining the Proposed Development to record waterbird species occurring in areas that may be at risk from noise and visual disturbance during construction and operation.
Non-Breeding Birds (Volume VI Appendix 7.3)	Surveys of terrestrial habitats for non-breeding birds were undertaken monthly between October 2022 and March 2023 with surveys based on the methods described by Bibby <i>et al.</i> (Ref 7-33) and Gilbert <i>et al.</i> (Ref 7-34).	October 2022 – March 2023	Wintering surveys of terrestrial habitats covered the areas of the Proposed Development walked to within 50m, including

Survey Type and relevant technical appendix)	Scope and Method	Survey Period	Survey Extent
VI Appendix 7.2)			approximately a 50m buffer of the Site.
Breeding Birds (Volume VI Appendix 7.2)	A standard territory mapping methodology for surveying breeding birds as detailed in Bibby et al. (Ref 7-33) and Gilbert et al. (Ref 7-34) was implemented. Regular stopping points were included along the survey route to record any species that may be passing through the survey area. Bird behaviour (singing, calling, carrying food, nest building) was recorded and mapped. A total of three visits were undertaken between June and July 2023. Due to the survey being undertaken late in the season any species recorded within the terrestrial habitats of the Site was deemed to be breeding where birds were recorded singing; were in suitable habitat; agitated behaviour/anxiety calls from adults (suggesting the presence of a nest or young nearby); or juvenile birds were recorded.	June-July 2023	Areas of terrestrial habitat at and surrounding the main works areas at Tilbury. Access routes along existing roads or access tracks were excluded from the scope.
Bats – Roost Suitability Surveys (Volume VI Appendix 7.5)	Following identification of features potentially suitable for roosting during the November 2023 Extended Phase 1 survey an internal inspection of the small switch room building within the proposed Tilbury SEC was undertaken on 22 February 2023. An external preliminary roost assessment (PRA) of all existing trees and structures at the Tilbury Site was undertaken on 5 May 2023.	February & May 2023	Existing SEC at Tilbury and smaller switch room building within hard standing area at proposed Tilbury SEC.
Bats – Activity Surveys (Volume VI Appendix 7.5)	A total of three bat transect surveys were undertaken at the Tilbury Site, with visits in May, July, and August 2023. Surveys were undertaken in accordance with the relevant Bat Conservation Trust (BCT) guidelines at time of survey (Ref 7-19) covering the period from sunset until 2 hours after sunset. Prior to each walked transect a static bat detector was deployed. This device was left in-situ for a minimum of 5 nights after each transect survey.	April – September 2023	Bat activity transect covered the Tilbury Site and adjacent habitat.
Bats – Emergence Surveys (Volume VI Appendix 7.5)	One dusk bat emergence was undertaken on 24 May 2023 for the small switch room within the hard standing area at proposed Tilbury SEC (low roost suitability). Two surveyors observed the building from 15 minutes before sunset to 2 hours after sunset. All emergence/re-entry surveys will include the use of an IR camera in line in accordance with BCT's interim guidance note (Ref 7-35).	May 2023	Switch room building within hard standing area at proposed Tilbury SEC.
Great Crested Newt (Volume VI Appendix 7.3)	Habitat Suitability Index (I) surveys were undertaken in parallel with the Extended Phase 1 Habitat survey in November 2023 utilising the method set out within Amphibian Reptile Group (ARG) Advice Note 5 (Ref 7-36). Great crested newt environmental DNA (eDNA) samples were undertaken of the ditches within and adjoining the Tilbury Site on 4 May 2023, and subject to laboratory analysis.	November 2023 (HSI) and May	Suitable waterbodies within 500m of the Site

Survey Type and relevant technical appendix)	Scope and Method	Survey Period	Survey Extent
		2023 (eDNA)	
Invertebrates (Volume VI Appendix 7.8)	An invertebrate specialist with previous experience of surveying at the Site visited on three occasions (July, August and September 2023) to undertake walkover surveys and collect samples. During each visit a range of techniques were used including ground searching, yellow pan traps, sweep netting, suction sampling; beating and direct observation. A particular focus was placed on establishing the presence/absence of protected and/or notable species known to occur within the wider Tilbury Estuary and Marshes.	July-September 2023	Habitats within and adjacent to the Site
Badger (Volume VI Appendix 7.6)	Walkovers surveys of the Tilbury Site were undertaken on 7 July 2023 and 11 September 2023. The aim of the surveys was to provide robust evidence for the presence or likely absence of badgers. The survey was conducted using best practice guidance based on Harris S, Cresswell P and Jefferies D Surveying Badgers (Ref 7-37), recording field signs indicating presence of badger including setts, day beds (above ground areas where badgers sleep), badger latrines, diggings or snuffle holes. Two sett entrances (one within and one outside of the Site) were subject to camera trap survey between 11 th September 2023 and 24 th September 2023 to confirm levels of current badger activity.	July & September 2023	Habitats within and adjacent to the Site + known sett locations to the south-east of the Site
Reptile (Volume VI Appendix 7.7)	A total of 50 artificial refugia (a mix of roofing felt and corrugated iron) were deployed within the Tilbury Site on 4 May 2023. Refugia were then subject to survey checks in accordance with the guidance provided in Froglife Advice Sheet 10 (Ref 7-38) and the Herpetofauna Workers' Manual (Ref 7-39) between 19 May 2023 and 5 October 2023. Due to unseasonably hot conditions during early September 2023 a total of 8 survey visits were undertaken.	April - September 2023	Habitats within and adjacent to the Site
Water Vole and Otter (Volume VI Appendix 7.4)	A water vole survey was undertaken on ditches WB1 and WB2 within and adjacent to the Site. Suitable ditches or watercourses within the site were searched for signs of water voles and/or otter. Two survey visits were undertaken in accordance with the methods set out in the Water Vole Mitigation Handbook (Ref 7-40). The first in May 2023 and the second in September 2023.	May - September 2023	Ditches within and adjacent to the Site.

7.4 Consultation and Stakeholder Engagement

7.4.1 There has been ongoing consultation and engagement with stakeholders. This is reported in Table 7-6. Project Responses to the EIA Screening Opinion received from Gravesham Borough Council are presented in ES Volume VI Appendix 4.2. Wider details on the consultation undertaken for the ES is detailed in ES Volume II Chapter 5: Consultation.

Table 7-6: Consultation and Stakeholder Engagement Log

Date	Type	Topics Discussed/Comments Received	Project Response
25 November 2022	Royal Society for the Protection of Birds (RSPB)	The RSPB stated that ground nesting birds will be a key consideration during construction phase along with other Schedule 1 birds such as marsh harriers and water voles. The RSPB also recommended Cliffe Pools as being suitable locations for exported spoil, stating that the RSPB are interested in using tunnel spoil from the Proposed Development to provide wildlife benefits at this location, should it be suitable. During the meeting, details of relevant RSPB contacts were provided to allow continued and meaningful engagement.	Embedded mitigation includes measures to ensure habitat clearance works are timed appropriately to minimise impact on bird populations.
1 December 2022	Meeting - RSPB	A meeting was held with the RSPB to further introduce the project and the options considered. The RSPB stated that the Shorne coast designated site is one of the best breeding sites for Redshank in the country, and that the area would benefit from improvements to the freshwater supplies.	No change in water quality expected as a consequence of the Proposed Development.
28 November 2022	Meeting – Natural England	Natural England outlined proposals for designation of a SSSI as part of the 'Thames Estuary Invertebrates Essex and Kent SSSI' notification project. Concern raised in particular regarding Goshem's Farm, an Ingrebourne Valley site which consists of ash deposits, has undergone 10 years of ecological monitoring and is particularly important for invertebrates with species of national interest. Identified importance of foreshore habitats at Tilbury as potentially supporting habitat for the SPA.	The final design at Tilbury has sought to minimise the impact on any future SSSI notification. The raised plateau of invertebrate interest has been avoided entirely. Bird surveys have been undertaken to ascertain the value of the foreshore habitats at Tilbury and Gravesend as supporting habitat for the nearby SPA.

Date	Type	Topics Discussed/Comments Received	Project Response
09 February 2023	Meeting – Natural England	National Grid updated on the project's option work and progression with the new tunnel option, and currently looking at options for siting the required sealing end compounds. Natural England advised to ensure that location decision making is an iterative process informed by ecological survey findings consistent with best practice. A robust demonstration of alternatives will be critical for the EIA process, as the current proposed location falls within an area proposed by NE for SSSI notification in the coming months. As a 's28g' public body with duties towards both biodiversity generally and SSSIs specifically, the project is urged to avoid areas proposed for SSSI notification. Natural England also advised that the ash field is particularly sensitive and should be avoided. Natural England were also keen to engage in beneficial re-use of tunnel arisings.	The design at the Tilbury Site has sought to minimise impacts through positioning the proposed SEC largely within an existing area of hardstanding. National Grid are still in discussion with a number of parties regarding sustainable disposal of tunnel spoil and are confident of securing a sustainable end-use for tunnelled material.
20 March 2023	Meeting – Natural England	National Grid presented optioneering work on ecological constraints. National Grid set out view that HRA was not required for the GI works proposed. NE subsequently confirmed HRA was required if works were to occur during the wintering season. Natural England identified a number of NE funded survey reports to be published via Access to Evidence covering surveys undertaken in support of proposed North Thames Estuary and Marshes SSSI.	National Grid delayed GI works such that they commenced outside of the time window of concern to National Grid. Natural England survey reports subsequently obtained via Access to Evidence website and included in desk study data sources (see Table 7-4)
17 September 2023	Meeting - Buglife	National Grid outlined results of 2023 surveys and design of the Proposed Development. Buglife were reassured by the small footprint of the project at Tilbury, and not concerned regarding expected impacts assuming embedded mitigation measures are included. Requested that in reinstating the site the contractor is encouraged not to flatten the site and leave ruts/depressions to increase invertebrate habitat mosaic.	Guidance on reinstatement incorporated to embedded mitigation measures identified in Section 7-40; and will be included as a requirement within the Contractor's requirements. A biodiverse brown roof has been included within the design at both Tilbury and Gravesend sites. Design will incorporate principles identified in Buglife guidance (Ref 7-41).

Date	Type	Topics Discussed/Comments Received	Project Response
22 September 2022	Meeting – Natural England	A meeting was held with Natural England to discuss the scope and progress of the ecological assessment, the Report to inform the HRA and the approach to Biodiversity Net Gain (BNG) HRA: The working noise modelling results were discussed. It was confirmed that an increase of 3dB from the baseline is Natural England's internally agreed approach, but that there is a difference between perceptible noise change and what would influence bird behaviours/cause disturbance. It was also raised that the HRA should consider other functionally linked land than just the foreshore and to consider ringed plover in the area, further inland of the foreshore. It was agreed that a draft of the Report to Inform the HRA would be provided to Natural England prior to the submission of the planning applications. Ecology Surveys: The ecology surveys undertaken for the Proposed Development were discussed, in particular the invertebrate, bird, reptile, badger and water vole surveys and the likely mitigation where required. BNG: A "first draft" of the BNG metric 4.0 was presented with an explanation of which elements of the work were being recorded as a loss/retained/delayed. This was to be developed to include a post-construction plan (landscape plan) and a BNG strategy to be included with the planning submission.	Changes to the requested scope of the HRA have been reflected in the final version of the HRA Likely Significant Effects Test Report.

Date	Type	Topics Discussed/Comments Received	Project Response
28 September 2023	Meeting - RSPB	A meeting was held with the RSPB to update on the progress of the project. An update was provided on the ecological survey work to date as well as early plans for reinstatement and landscaping. The RSPB suggested small ponds, which will help wildlife and that an approach that complements the Lower Thames Crossing's proposal. It was suggested no grazing or mowing, scrub habitat (hawthorn and blackthorn), long rough grass etc. The banks for existing ditches were also discussed e.g., shelves in south facing ditch banks and sand capping.	Relevant to Gravesend only – see Volume VI – Chapter 15
07 November 2023	Online Briefing – Thurrock Council	Thurrock officers requested that National Grid continue to seek engagement from local stakeholder groups and counsellors who may not have engaged with the process to date.	Project team has approached counsellors again and will reach out to smaller groups when planning application is submitted.
September/October 2023	Public consultation responses	Public comments raised the following points: - Water vole present in the Thames and Medway Canal - Seals using the mudflats and lots of migrating birds present Works need to be sensitively planned due to value of Site for birds.	These points are taken into account in the embedded mitigation measures incorporated into the design of the Proposed Development.
September/October 2023	Public consultation responses	Public comments raised the following points: - Water vole present in the Thames and Medway Canal - Seals using the mudflats and lots of migrating birds present - Works need to be sensitively planned due to value of Site for birds.	These points are taken into account in the embedded mitigation measures incorporated into the design of the Proposed Development.

Date	Type	Topics Discussed/Comments Received	Project Response
6 December 2023	Feedback on landscaping and invertebrate mitigation (Tilbury only)	Natural England requested: - removal of scattered scrub and trees from landscaping proposals for Tilbury Site; - further details on habitat translocation proposed; - habitat loss gain figures relating to tall fescue planthopper - relate impacts to % availability of the habitat resource for tall fescue planthopper - details of how retained habitats will be safeguarded. In addition, they stated that a Landscape and Ecological Mitigation Plan or equivalent will be required, and that monitoring and long-term management arrangement should be set out	Scrub and trees have been removed from the Outline Landscape and Ecology Plan. Further details of habitat translocation and expected management/monitoring are provided in Sections 7.8 and 7.10. It is expected a detailed mitigation strategy for tall fescue planthopper will be provided via condition.

7.5 Baseline Environment

Designated Sites

Statutory Designated Sites

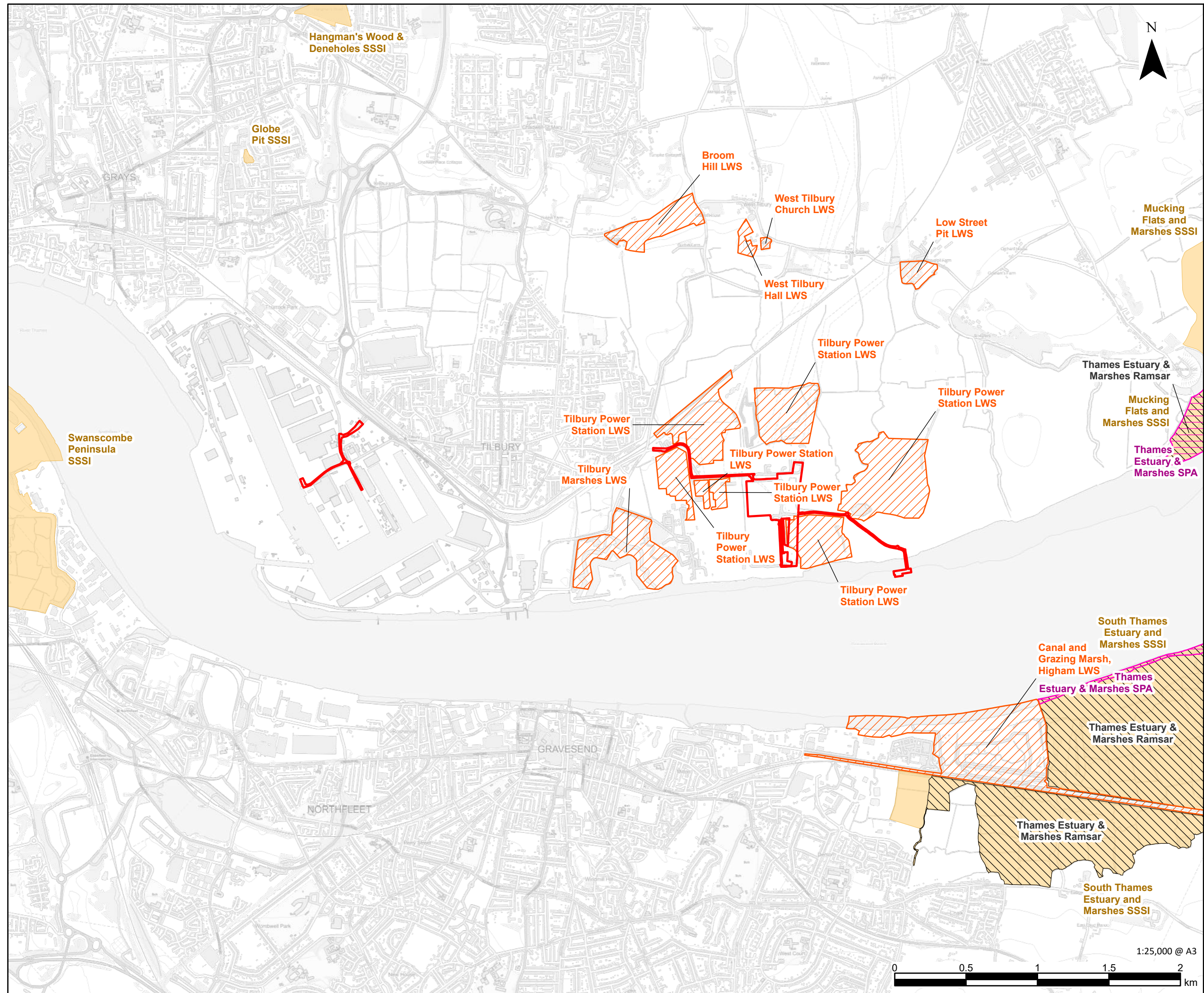
7.5.1 Table 7-7 provides a summary of the statutory designated sites within the Study Area, as shown on Figure 7-1.

Table 7-7: Statutory Designated Sites within Study Area

Site	Reason for Designation	Distance from Tilbury Site
Thames Estuary & Marshes Special Protection Area (SPA)	The site consists of coastal, estuary, floodplain, and intertidal habitats, hosting a range of internationally significant overwintering birds. Qualifying species include overwintering populations of pied avocet (<i>Recurvirostra avosetta</i>); and hen harrier (<i>Circus cyaneus</i>). In addition, the following migratory species: ringed plover (<i>Charadrius hiaticula</i>); grey plover (<i>Pluvialis squatarola</i>); dunlin (<i>Calidris alpina</i>); knot (<i>Calidris canutus</i>); black-tailed godwit (<i>Limosa islandica</i>); and redshank (<i>Tringa tetanus</i>). The estuary and adjacent grazing marsh areas support an important assemblage of wintering waterbirds including grebes, geese, ducks and waders.	1.3km south-east (southern bank of Thames) and 1.9km east (northern bank of Thames)
Thames Estuary & Marshes Ramsar site	The site comprises a complex of brackish, floodplain grazing marsh ditches, saline lagoons and intertidal saltmarsh and mudflat. The habitats support internationally important numbers of wintering waterfowl, and the saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.	1.3km south-east (southern bank of Thames) and 1.9km east (northern bank of Thames)
Mucking Flats & Marshes Site of Special Scientific Interest (SSSI)	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. Also supports significant numbers of waders such as Curlew sandpiper and an important late summer flock of yellow-legged herring gulls. Between the sea wall and mean high water line lie areas of high-level saltmarsh of a type uncommon in Essex. The saltmarsh has a high invertebrate interest, which includes the rare spider <i>Baryphyma duffeyi</i> .	1.3km south-east (southern bank of Thames) 1.9km east (northern bank of Thames)
South Thames Estuary and Marshes SSSI	The site consists of an extensive mosaic of grazing marsh, saltmarsh, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes. Supports outstanding numbers of wintering birds, and also of breeding bird interest	3km south-east (southern bank of Thames)
Swanscombe Marine Conservation Zone (MCZ)	The Thames Estuary as a whole is an extremely important tidal river. The seabed of Swanscombe MCZ is composed largely of shells, pebbles, sands and mud. The site supports tentacled lagoon worm (<i>Alkmaria rominini</i>), which are found in the intertidal and subtidal soft sediments. This small worm is scarce throughout the UK.	2.2km north-west
Swanscombe Peninsula SSSI	A corridor of habitats connecting Ebbsfleet Valley with the southern shore of the River Thames between Dartford and Gravesend. Biological features of special interest are populations of a number of rare /notable plant species; assemblages of invertebrates and breeding birds.	1660m to the west
North Downs Woodlands Special Areas of	The site consists of mature Asperulo-Fagetum beech forests and yew (<i>Taxus baccata</i>) woods within a mosaic of scrub and other woodland types. The site also contains semi-natural dry	8.4km south

Site	Reason for Designation	Distance from Tilbury Site
Conservation (SAC)	grasslands and scrubland facies on calcareous substrates which is an important orchid site.	
Medway Estuary and Marshes SPA	Medway Estuary and Marshes SPA covers both marine and terrestrial areas. There is a diverse mix of intertidal habitats, including saltmarshes, mudflats, shell beaches and eelgrass beds. These habitats support a diverse range of water birds throughout the year, including breeding waders and terns in the summer and important numbers of geese, ducks, grebes and waders in winter.	9.9km southeast

- 7.5.2 The Thames Estuary and Marshes SPA and Ramsar Sites are both of **International** importance. These sites cover areas of coastal, estuary, floodplain, and intertidal habitats located on both sides of the River Thames. The distances shown in Table 7-7 identify the distance to the boundary of the designated site at its closest point. However, the northern banks of the Thames adjoining the Tilbury Site support significant areas of intertidal habitat and along with terrestrial habitats adjoining the Tilbury Site have been identified in correspondence with Natural England (pre-application meeting 28/11/22 see Table 7-6) as potential 'supporting habitat' for the bird populations for which the Thames Estuary and Marshes Ramsar/SPA are designated.
- 7.5.3 The North Downs Woodland SAC; Medway Estuary is of **International** importance but being located 8.4km to the south of the Tilbury Site with no functional linkage is not expected to be impacted by the Proposed Development. It is not considered further in the assessment.
- 7.5.4 The Mucking Flats and Marshes SSSI and South Thames Estuary SSSI are both of **National** importance. Natural England is considering an extension to the Mucking Flats and Marshes SSSI. It is understood that the area being considered includes the land to the north and south of the proposed Tilbury SEC. Given that the proposed SSSI is yet to be formally notified to interested parties, it is currently not considered to have a legal status. As such the areas proposed for designation are not considered as a statutory site in this assessment. However, the value of these areas is reflected in the valuation of existing non-statutory sites and in relation to the valuation of the species populations and assemblages which they support.
- 7.5.5 The Swanscombe Marine Conservation Zone (MCZ) is located within the channel of the River Thames approximately 2.2km to the west of the existing docks at Tilbury which would be used for spoil removal by barge. It is approximately 5km to the west of the cable tunnel alignment. It is of **National** importance.
- 7.5.6 The Swanscombe Peninsula SSSI is of National importance and while within 2km of the existing docks at Tilbury which would be used for spoil removal by barge, the SSSI is over 4km from the remainder of the Tilbury Site.



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NOTES	
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Environmental Statement	
PROJECT NUMBER	
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FIGURE TITLE	
Designated Sites for Nature Conservation	
FIGURE NUMBER	
Figure 7.1	

Non-Statutory Designated Sites

7.5.7 Table 7-8 provides a summary of the non-statutory designated sites within the Study Area, as shown on Figure 7-1.

Table 7-8: Non-Statutory Designated Sites within Study Area

Site (size ha)	Reason for Designation	Distance from Tilbury Site
Tilbury Power Station Local Wildlife Site (LWS) (48.8ha)	A large, multi-site designation that encompasses a number of previously designated sites including Lytag Brownfield, Tilbury Centre and Goshems Farm. The sites are of importance for their coastal grazing marshes, post-industrial sites and hotspots for reptile diversity. The habitat also supports key invertebrate communities.	Partly within the Site
Tilbury Marshes LWS (40.5ha)	Relic grazing-marsh, brackish ditches, outer moats and grasslands at Tilbury Fort. The Site supports many Nationally Scarce plant species and important invertebrate communities.	0.6km southeast
West Tilbury Church LWS (0.5ha)	Ancient grassland beyond a privately owned church with nationally restricted plant assemblages including Wild Clary (<i>Salvia verbenaca</i>) and Lesser Calamint (<i>Clinopodium calamintha</i>).	1.46km north
West Tilbury Hall LWS (1.6ha)	A river terrace slope site selected for the lowland dry acid grassland habitat of principal importance and diverse invertebrate fauna including nationally rare Bryony Mining Bee (<i>Andrena florea</i>)	1.46km north
Canal and Grazing Marsh, Higham LWS (60.57ha)	Coastal and floodplain grazing marsh is found on low-lying coasts and along slow-flowing rivers and estuaries. Some 500 plants have been recorded from the most diverse grazing marshes, but these comprise just 5% of grazing marshes - most have been agriculturally 'improved' and are of limited botanical interest. Perennial rye-grass (<i>Lolium perenne</i>), Yorkshire fog (<i>Holcus lanatus</i>) and rushes tend to dominate the sward, enlivened by damper patches of floating sweet-grass (<i>Glyceria fluitans</i>), creeping bent (<i>Agrostis stolonifera</i>) and silverweed (<i>Argentina anserina</i>).	1.20km southeast
Low Street Pit LWS (3.6ha)	A site that lies on regionally important Thames terrace gravel. Remnants of old grassland with a diverse invertebrate community associated with the site, including hornet robberfly (<i>Asilus crabroniformis</i>) a national BAP species.	1.44km northeast

7.5.8 Habitats within the Tilbury Power Station LWS form part of the larger network of habitat to the north of the Thames that Natural England are considering as an extension to the Mucking Flats & Marshes SSSI. While the area is yet to be formally statutory designated, given the known value of the site for both invertebrates and reptiles the LWS is considered on a precautionary basis as being of up to **National** importance.

7.5.9 Areas required for the removal of overhead lines linking to the existing Tilbury SEC are located within the Tilbury Power Station LWS. However, the proposed Tilbury SEC is located outside of, but adjacent to the Tilbury Power Station LWS.

7.5.10 All of the remaining LWS's within the Study Area are of **County** importance.

7.5.11 Most of the Site (except the Tilbury SEC) falls within an area identified by Buglife as an Important Invertebrate Area (IAA) (Ref 7-40). This denotes an area Buglife consider to be nationally or internationally significant places for the conservation of invertebrates.

7.5.12 The access route to the Ingrebourne Valley jetty is located within an area identified within the 'All of a Buzz in the Thames Gateway' study by Buglife and Natural England (Ref 7-42) as of high potential for supporting notable invertebrate assemblages.

- 7.5.13 The Tilbury Site also falls within the Greater Thames Marshes Nature Improvement Area (NIA). The NIA seeks to protect and enhance this valuable habitat and increase numbers of endangered species and protect existing flora and fauna.
- 7.5.14 Land adjacent to the eastern boundary of the Gravesend Site to the south of the Thames is part of the Shorne Marshes RSPB reserve. This is a reserve not accessible to the public but managed for its nature conservation importance, including value to a range of bird species. Impacts on the site are considered within Volume IV Chapter 15 of this ES, and therefore are not considered further in this chapter.
- 7.5.15 There is no ancient woodland within 2km of the Site.

Habitats

- 7.5.16 The habitats within the Site are shown on Figure 7-2.

Hardstanding and bare ground

- 7.5.17 The proposed SEC and cable tunnel shaft are located predominately within an area of existing hardstanding, which was disused and starting to revegetate with locally frequent growth of young butterfly bush (*Buddleja davidii*) and occasional ruderal/ephemeral species including broad-leaved dock (*Rumex obtusifolius*), mugwort (*Artemisia vulgaris*), scentless mayweed (*Tripleurospermum inodorum*) and sea beet (*Beta vulgaris*).
- 7.5.18 The area immediately to the south of the proposed Tilbury SEC and area of car parking and access road linking to the existing SEC also consist of hardstanding with occasional ruderals. A large area to the east of the proposed SEC is currently used for car storage and is unvegetated. A narrow strip of unmanaged grassland between the hardstanding slab and the access road support tussocky grassland dominated by tall fescue.
- 7.5.19 The Tilbury Site includes a route via existing tarmacked roads to an existing berth at the Port of Tilbury. An alternative access route to a jetty to the east of the Site (Ingrebourne Valley jetty) utilises a combination of existing tarmacked roads and unsurfaced tracks/bare ground that have been regularly disturbed by vehicles movements during to the ongoing reclamation/restoration of this area.
- 7.5.20 The areas of hardstanding habitat and immediate surrounds are common, widespread and not Habitat of Principal Importance under Section 41 of the NERC Act (2006 as amended). As a consequence, they are only of **Negligible** importance and are not considered further in the assessment.

Grassland/scrub/reed mosaic

- 7.5.21 The area of grassland to the north of the proposed Tilbury SEC would be subject to temporary works for realignment of pylons and other services. It showed strongest affinity to the NVC community MG1b *Arrhenatherum elatius* grassland. This area was species poor, dominated by false-oat grass (*Arrhenatherum elatius*) with other grasses including occasional tall fescue and frequent bristly ox-tongue (*Helminthotheca echioides*) and creeping thistle (*Cirsium vulgare*). Areas of dense scrub surround the grassland and scrub species included Russian olive (*Elaeagnus angustifolia*), bramble (*Rubus fruticosus* agg), common hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), common plum (*Prunus domestica*) and buddleja (*Buddleja davidii*). Some areas were dominated by common reed (*Phragmites australis*) and are classified as NVC community S4 *Phragmites australis* swamp and marshes.
- 7.5.22 The eastern margin of the proposed Tilbury SEC location contains a strip of roadside verge (approx. 10m width) dominated by tall fescue (*Schedonorus arundinaceus*) and false-oat grass with encroaching stands of dense scrub.
- 7.5.23 The area of grassland to the south of the proposed Tilbury SEC would be subject to temporary works associated with the removal of existing overhead lines. It consisted of unmanaged grassland with scattered mixed scrub and localised patches of tall ruderals. The 2023 NVC survey found the grassland areas to have closest affinity with the NVC community MG1b *Arrhenatherum elatius*

grassland – *Urtica dioica* subcommunity. It was found to be relatively diverse in comparison with the area to the north, dominated by false oat-grass, with frequent common couch (*Elymus repens*), and occasional species including rough meadow grass (*Poa trivialis*), goat's rue (*Galega officinalis*), creeping cinquefoil (*Potentilla reptans*), black medick (*Medicago lupulina*), fennel (*Foeniculum vulgare*), wild carrot (*Daucus carota*), mugwort (*Artemisia vulgaris*) and crow garlic (*Allium vineale*). The areas of grassland were interspersed with dense stands of scrub with a similar range of species to those recorded in the area to the north of the proposed Tilbury SEC.

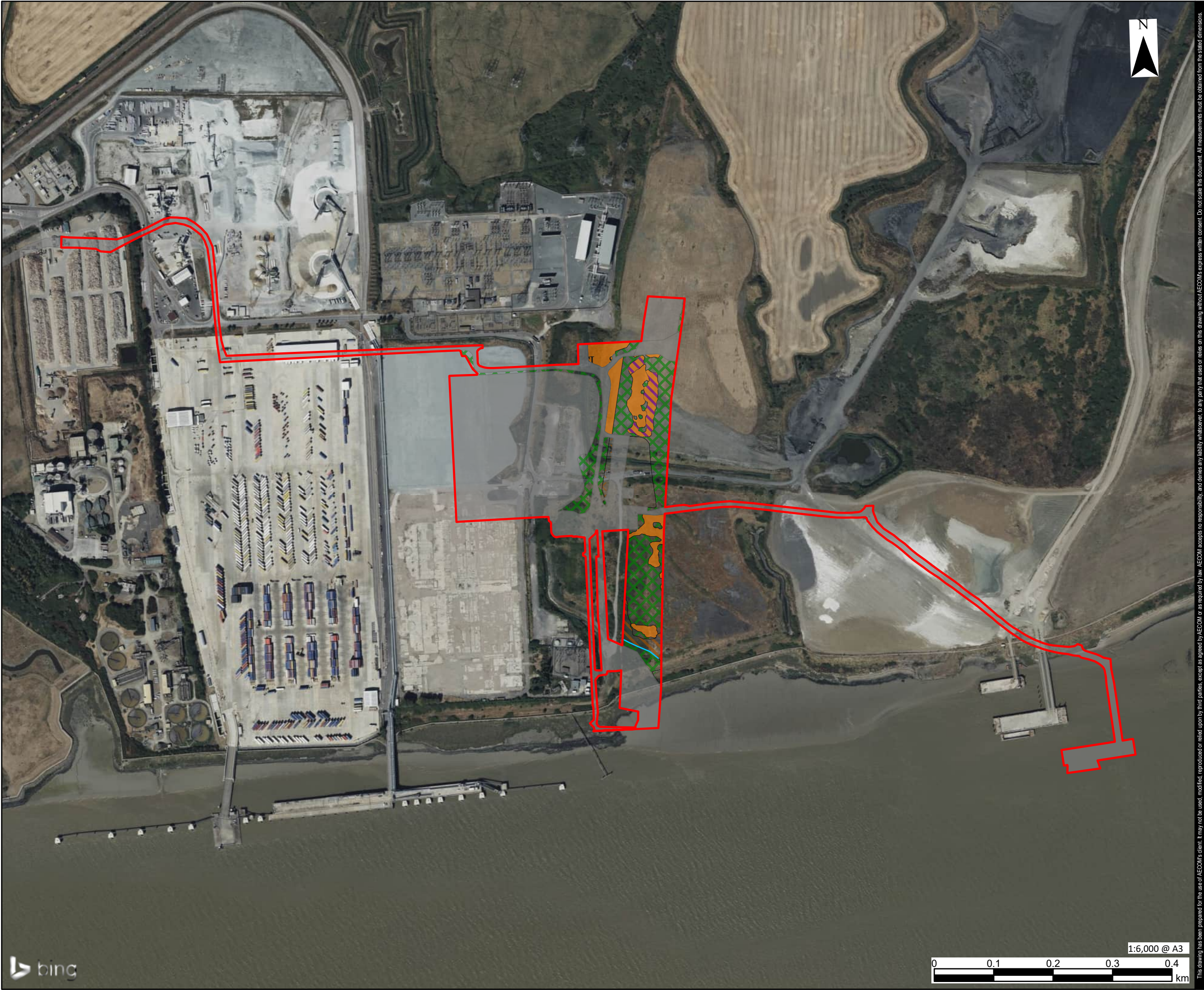
- 7.5.24 A small area adjoining the ditch in the south of the Tilbury Site is more frequently disturbed and supported a range of ruderal/ephemeral species including hemlock (*Conium maculatum*), creeping thistle, sea beet, mugwort, common nettle and occasional narrow leaved birds foot trefoil (*Lotus tenuis*).
- 7.5.25 While the areas of grassland between the existing and proposed SECs is more diverse than that to the north, neither are considered to be Habitat of Principal Importance. They are markedly different in character to the areas of habitat creation on the Pulverised Fuel Ash (PFA) outside of the Tilbury Site Tilbury site which contain frequent bare ground and meet the criteria to be considered Open Mosaic Habitat on Previously Developed Ground. The areas of habitat within the Tilbury Site are more established with and unlike those areas support largely closed sward structures with limited remaining bare ground or areas of disturbance.
- 7.5.26 The section of the Tilbury Site between the existing and proposed Tilbury SEC is identified by Natural England (Ref 7-43) as priority habitat (i.e., Habitat of Principal Importance) with no main habitat identified. However, based on the 2023 survey data only the small reed dominated areas in the north of the Site are considered to be Habitat of Principal Importance (reedbed).
- 7.5.27 Overall, the mosaic of grassland, reedbed, scrub and ruderal habitats to the north and south of the proposed Tilbury SEC provide are of greater value than the individual components, with the structural complexity of the habitats increasing their value for faunal species. The habitats are as a mosaic considered to be of **District** value.

Ditches/Drains

- 7.5.28 Two tidal ditches/drains are located partially within the Site. Both have connectivity with the River Thames and support brackish water.
- 7.5.29 The drain which adjoins the existing Tilbury SEC is steep sided and supports dense marginal stands of common reed, and occasional bulrush (*Typha latifolia*) with no visible submerged or floating aquatic macrophytes.
- 7.5.30 The drain to the east of the proposed new Tilbury SEC is heavily overgrown in sections by scrub from the adjoining embankment, with fringing areas of common reed further to the north and around the base of the existing pylon which would be removed as part of the Proposed Development.
- 7.5.31 A third seasonally wet ditch is located on the northern and eastern boundaries of the hardstanding slab to the east of the proposed Tilbury SEC that will be used for the construction compound. The ditch contains patches of common reed and tussocky grassland with some sections overshadowed by scrub.
- 7.5.32 The ditches are common of those found within the wider Thames Estuary Marshes and are of **Local** Importance.

Habitats Adjoining the Site

- 7.5.33 A built-up plateau to the east of the Tilbury Site is understood to have been created from Pulverised Fuel Ash (PFA) and supports the Habitat of Principal Importance Open Mosaic Habitat on Previously Developed Ground. The area has been created as mitigation for previous developments and is managed to maintain brownfield habitats. This area forms part of the Tilbury Power Station LWS and is expected to be included in any future extension to the Mucking Flats and Marshes SSSI. This area of habitat is considered to be of up to **National** importance.



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LEGEND

- Red Line Boundary (Above Ground)
- Ditch
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B2.1 - Neutral grassland - unimproved
- B2.2 - Neutral grassland - semi-improved
- B5 - Marsh/marshy grassland
- C1.2 - Bracken - scattered
- C3.1 - Other tall herb and fern - ruderal
- J5 - Other habitat
- Hardstanding

NOTES

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ISSUE PURPOSE

Environmental Statement

PROJECT NUMBER

60677311

FIGURE TITLE

Phase 1 Habitat Map

FIGURE NUMBER

Figure 7.2

- 7.5.34 The desk study has identified that the areas of saltmarsh and mudflats to the south of the Tilbury Site adjacent to the River Thames are habitats of principal importance listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act, 2006. These habitats are considered to be of up to **County** Importance.
- 7.5.35 The River Thames Estuary supports a range of protected and notable habitats as documented in Volume VI - Appendix 7.12, including saltmarsh, and intertidal mudflats and sediments. The Estuary is therefore considered to be of **Regional** importance. However, as detailed in Appendix VI - Appendix 7.12 no construction works are required within marine habitats and the tunnel will be bored approximately 30m below the surface, so no indirect impacts are expected. Marine habitats are therefore scoped out of further assessment.

Species

- 7.5.36 Table 7-9 presents a summary of desk study and field survey results for protected and/or notable species at the Tilbury Site, alongside an evaluation of their importance. Full descriptions of the baseline conditions are provided in Volume VI Appendices 7.1 to 7.9 of this ES.

Table 7-9: Summary of baseline details for legally protected and notable species

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
Bats (Volume VI – Appendix 7.5)	The Tilbury Site supports no active bat roost within or adjoining the Site. Activity surveys and static detector surveys identified usage of the Site by low numbers of common bat species in particular common pipistrelle and soprano pipistrelle with occasional records of Nathusius's pipistrelle and Noctule/Leisler's⁴ bat.	Bat assemblage utilising the Tilbury Site and surrounding habitats	Local	The Tilbury Site provides very limited roosting opportunity and supports a typical range of common bat species. There are no strong or established commuting routes.
Intertidal Birds (Volume VI – Appendix 7.2)	Surveys of the intertidal area by the Tilbury 2 project in 2016/2017 overlapped with the Tilbury Site. The surveys recorded low peak counts of the following SPA species: black tailed godwit; dunlin; gadwall; grey plover; little egret; redshank, ringed plover and shelduck. Thurrock Flexible Generation Plant surveys were undertaken between September 2019 and March 2020. Peak counts from survey areas relevant to the Tilbury Site included notable peak counts for the following SPA species: avocet (49); curlew (27); dunlin (124); gadwall (11); ringed plover (65). The Lower Thames Crossing undertook intertidal bird vantage point surveys between 2017 and 2019 approximately 400m east of the Gravesend Site, and around 500m east of the Tilbury Site. Although not overlapping the Gravesend and Tilbury sites the data illustrates the importance of the intertidal areas to the east of the Site, with high overall peak counts in particular of avocet (<i>Recurvirostra avosetta</i>), black-tailed godwit (<i>Limosa</i>	Intertidal wetland bird assemblage utilising Tilbury Site and adjoining habitat	County	No waterbird species recorded within the Survey Area in 2022/2023 represented 1% or more of the international or national population estimates used for assessing populations. The following six species, all recorded within the Tilbury Site survey area in 2022/23 had peak counts exceeding 1% of the SPA/Ramsar populations: gadwall; little egret; avocet; black tailed godwit; dunlin; and redshank. In addition, the same areas support a range of red and amber Birds of Conservation Concern (BoCC) species. However, in the context of the wider Thames Estuary, the Tilbury Site Survey Area is only occasionally used

⁴ Leisler's, noctule and serotine bat can be difficult to identify accurately if only part of the call is present towards the lower end of the serotine and Leisler's bat frequency and upper end of the noctule peak frequency, therefore unless the species could be clearly distinguished these have been grouped together.
December 2023

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
	<i>limosa</i>), dunlin (<i>Calidris alpina</i>), lapwing (<i>Vanellus vanellus</i>) and redshank (<i>Tringa totanus</i>). The intertidal surveys undertaken between October 2022 and September 2023 at both sites identified a total of 30 waterbird species using the intertidal survey area (28 at the Tilbury Site and 23 at Gravesend Site). In addition, marsh harrier (<i>Circus aeruginosus</i>) was recorded flying over the Tilbury Site intertidal survey area. The 2022/2023 surveys identified notable peak counts of the following SPA/Ramsar species: gadwall (53); grey plover (1); little egret (3); avocet (18), lapwing (10), black tailed godwit (51); dunlin (250), and redshank (20).			by these species and does not appear as important for waterbirds as intertidal habitats towards the mouth of the River Thames. The habitats within the Gravesend Site survey area support a diverse range of species but in lower numbers and with more sporadic distribution than areas to the east more closely associated with the Ramsar/SPA. On this basis they are considered to be of up to County Importance
Non-breeding Birds (Volume VI – Appendix 7.2)	Total of 28 species recorded during non-breeding bird surveys from October 2022 to March 2023 (22 at Tilbury and 17 at Gravesend). Protected/notable species recorded included: stock dove, woodpigeon; Cetti's warbler; wren, starling, song thrush, redwing, black redstart, dunnoek, grey wagtail, meadow pipit, and linnet.	Non-breeding bird assemblage at Tilbury Site and adjoining habitats	Local	No species listed on Annex 1 of the EU Birds Directive were recorded at the Tilbury Site. Five Species of Principal Importance were recorded at Tilbury Site, namely Starling, Song Thrush, Dunnock, Linnet and Reed Bunting. Three species are included on the BoCC Red List; Eight species are included on the BoCC Amber List. Species numbers were very low and no species were recorded at numbers of national (i.e., 1% or more of the UK non-breeding population) or county significance.

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
				Whilst some of the species of conservation importance that were recorded within the Tilbury Site are declining in the UK, most remain widespread. With the relatively low numbers of species recorded, using professional judgement, these are evaluated as being of no more than Local importance.
Breeding Birds (Volume VI – Appendix 7.2)	Surveys undertaken in support of the Lower Thames Crossing between 2017 and 2019 included survey of the Tilbury Power Station area which included the Tilbury Site. Peregrine activity was recorded to the west of the Tilbury Site, but this area now contains no features suitable for peregrine breeding. Cetti's warbler was recorded in the wider survey area. North Thames Estuary & Marshes area was surveyed by Natural England in 2022. This recorded breeding activity within the Tilbury Site including cuckoo, Cetti's warbler, linnet, reed warbler. In addition, marsh harrier was recorded foraging. Total of 24 species were recorded in the Tilbury Site survey area during 2023 surveys, and of these 21 species were assumed to be breeding (derived from confirmed and probable/possible territories). Protected/notable species assumed to hold territories were: pheasant (1 probable); moorhen (1 probable); woodpigeon (4 confirmed); skylark (1 confirmed); Cetti's warbler (1-2 confirmed); whitethroat (2-3 confirmed); wren (4 confirmed); song thrush (2 confirmed); dunnoek (2-3 confirmed); greenfinch (1-2 confirmed); and linnet (4-5 confirmed).	Breeding birds population at/adjoining Tilbury Site	Local	One species (Cetti's Warbler) recorded is listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended). Four species (Skylark, Song Thrush, Dunnock and Linnet) recorded are listed as a Priority Species in the UK. Three species (Skylark, Greenfinch and Linnet) are included on the BoCC Red List. Six species (Moorhen, Woodpigeon, Whitethroat, Wren, Song Thrush and Dunnock) are included on the BoCC Amber List. No species are present within the Survey Area in numbers of national significance, i.e., 1% or more of the UK population. Country criteria are not

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
	Other widespread/common species where territories were present included: blue tit; great tit; chiffchaff; reed warbler, blackcap, lesser whitethroat, blackbird, robin, and goldfinch.			available but based on the species recorded being relatively widespread and low number of territories none are likely to be of County importance. Local importance recognises that some individual species may have been missed during early part of the breeding season.
Great crested newt (Volume VI – Appendix 7.3)	WB6 (Gravel lake) is the only fully freshwater waterbody within 500m of the Tilbury Site, with other known waterbodies consisting of tidal ditches/drains supporting brackish water. WB6 was subject to survey in support of the Lower Thames Crossing DCO application (Ref 7-24) in 2018 and returned a negative result for eDNA and conventional survey. It also returned a negative result in the 2023 eDNA survey and therefore great crested newt is assumed to remain absent. The ditches/drains within 500m of the Site (WB1, WB2, WB3), are all identified within the Thurrock Flexible Power Generation Environmental Statement (Ref 7-25) as having been subject to great crested newt survey in 2016/2017 and 2017/2018. No great crested newts were identified. During 2023 surveys the ditches gave ‘inconclusive’⁵ results, which is likely due to the brackish nature of the water. Great crested newts are assumed to be absent.	WB1, WB2, WB3 and WB6	Negligible	Amphibians, including great crested newts respire partially through their damp skin through osmosis, and high levels of salinity reduce the efficiency of respiration, with some chemicals found within saline waters suspected to be toxic to amphibians, especially in high concentrations⁶. Great crested newt is assumed to be absent and are not considered further in this assessment.
Reptiles (Volume VI – Appendix 7.7)	The 2023 surveys confirmed presence of all four widespread reptile species with the following peak adult counts: adder (2), slow worm (11), common lizard (2) and grass snake (1 sighting during other surveys).	Reptile assemblage utilising Tilbury Site and	County	The presence of four confirmed species (adder, common lizard, slow worm and grass snake) and an aggregated score of seven (two low populations one good

⁵ An inconclusive result indicates that while no great crested newt eDNA was detected in the sample there may be some underlying degradation or inhibition which could have affected the result

⁶ Duff J.P., Colville K and Foster J (2011) Mass mortality of great crested newts (*Triturus cristatus*) on ground treated with road salt, Veterinary Record 2011 168: 282
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Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
	Adder are known to be slow in the uptake of refugia and the wider Tilbury power station site is known to support a significant adder population. Unseasonably high temperatures in September 2023, may have reduced peak counts during some of the September 2023 visits. In assessing population size classes consideration was given to results from surveys undertaken by Bioscan in 2001 (Ref 7-26) covering the field to the north of the proposed Tilbury SEC (25 refugia) and the verge surrounding the large area of hardstanding to the west of the proposed Tilbury SEC (30 refugia). Four survey visits were undertaken at each between April 2021 and July 2021 to check refugia. Peak adult counts were as follows: • marginal strip of grassland habitat surrounding the large hardstanding slab to the west of the proposed Tilbury SEC ('former power station coal stockyard'): 6 slow worm; 2 common lizard; 2 adder; 1 grass snake; • road verge adjoining and to northeast of proposed Tilbury SEC and field to the north of the proposed SEC ('land east of former coal stockyard'): 14 slow worm; 3 adder; 0 grass snake (1 immature only). On a precautionary basis for the purposes of the assessment the wider habitat surrounding the Tilbury Site is considered suitable to support up to a 'Good' population of adder; an 'exceptional' population of slow worm and 'low' populations of grass snake and common lizard.	adjacent habitats		population and one exceptional population) for the Tilbury Site. are indicators of a key reptile site based on the guidance set out in Froglife's Advice Sheet 10 (Ref 7-38). As such the Tilbury Site and wider surrounding habitats are considered an 'important' Site in relation to reptile biodiversity and the population is of County importance for widespread reptile species.

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
Invertebrates (Volume VI – Appendix 7.8)	Desk study information identified that habitats surrounding the Tilbury Site are of known high invertebrate interest for a range of brownfield species and are one of the reasons the area is proposed for designation as a SSSI. Surveys undertaken in 2023 identified a total of 334 species of which 35 are regarded as 'key species'⁷. This is a high total species list for a three-visit survey, substantially higher than average, and suggests that the Tilbury survey area is a very diverse site for invertebrates. A total of 5 Species of Principal Importance were recorded as follows: tall fescue planthopper (<i>Ribautodelphax imitans</i>); brown-banded carder-bee (<i>Bombus humilis</i>); shrill carder-bee (<i>Bombus sylvarum</i>); wall butterfly (<i>Lasiommata megera</i>) and small heath butterfly (<i>Lasiommata megera</i>). In addition, phoenix fly (<i>Dorycera graminum</i>); and five-banded weevil fox (<i>Cerceris quinquefasciata</i>) were not recorded but are considered likely to be present. The records of most note are of tall fescue-planthopper a species closely associated with its food plant tall fescue (a tussocky grass) and with very limited UK records. Until the 1990s it had only been recorded in Devon and Dorset, in more recent years it has been found at a handful of sites across the UK, including previous records at Tilbury, most recently from the Tilbury 2 Lytag site in 2016 (Ref 7-44).	Invertebrate assemblage utilising Tilbury Site and adjoining habitats	National	35 Key Species were recorded from the Tilbury survey area. However, of the 35 Key Species, a quarter (9 species) are here regarded as having out of date and inaccurate conservation statuses. A total of 5 accurately rated rare key species were found. Five Species of Principal Importance were recorded. A further two SPI were not recorded but are considered very likely to occur. The Tilbury Site and adjacent areas are considered to support an invertebrate assemblage of national importance. However, there is considerable variation in importance between areas, with some of very high importance (in particular the tall fescue dominated areas) and others of much lower importance. In general, the Key Species recorded from the Tilbury survey area are species which favour open habitats with a degree of disturbance
Badger (Volume VI – Appendix 7.6)	No badger setts were found within the Tilbury Site. However, badgers are known to be present in the wider surrounding area	Badger population at Tilbury	Site	Badgers are widespread in Essex, and a breeding population is known to utilize the wider local area with foraging

⁷ Defined as Red Data Book and Nationally Scarce species from British Red Data Book for insects Version 1; Threatened, Near Threatened and Data Deficient species from version 2, and Nationally Rare or Nationally Scarce species from version 3.

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
	and several setts were recorded outside of the Tilbury Site including main setts. One single entrance outlier sett (Sett Reference TS3) was identified outside of the Tilbury Site approximately 20m to the east of the existing hardstanding to be used as car parking, and 70m to the south of the shaft/headhouse location. Camera trap monitoring indicated that the sett was not 'currently in use' (i.e., it showed no evidence of use by badger over a period of two weeks). However, it remains suitable for use by badger and badger are known to be present in adjacent habitats. A mammal entrance M1 is located in close proximity to the proposed Tilbury SEC. This is not currently suitable for use by badgers.			habitat expected to include the habitats with the Tilbury Site. The population is of Site importance only, and consequently is only considered further in this ES chapter with respect to legislative compliance. The identified setts will be retained and checks undertaken to ensure no new ones are dug within works areas prior to commencement.
Water Vole (Volume VI – Appendix 7.4)	The desk study identified that the ditches within and adjacent to the Tilbury Site as supporting water vole. Based on survey results from between 2017 and 2020 (Ref 7-23) (Ref 7-25) population estimates were as follows: - WB1 was found to support a medium water vole population; - WB2 and WB3 was found to support high water vole populations. - WB6 was found to support water vole in 2015 and 2018 but were not found in 2021. Small population assumed. During the 2023 surveys field signs of water vole were recorded in the form of latrines and feeding remains along the length of WB3 which adjoins the proposed Tilbury SEC. While only three latrines were identified during the September 2023 visit, given the density of vegetation it is likely that others were present. As a precaution for the purposes of assessment it	Water vole populations utilising WB1, WB3, and WB6	District	Water vole has undergone a massive decline in numbers at a UK level over the last 50 years. They are a Habitat of Principal Importance and the wider population on the Tilbury marshes is known to of regional importance.

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
	is assumed that WB3 continues to support a high population of water vole. No positive evidence of water vole presence was found at WB1 during the 2023 surveys. WB1 adjoins an access road and area of hardstanding that will be used for car parking during construction of the Proposed Development. It is assumed as a precaution that WB1 continues to support at least a small population of water vole.			
Otter (Volume VI – Appendix 7.4)	There are no recent records of otter activity in the vicinity of the Tilbury Site.	None	Negligible	There are no recent records of otter activity, and they are assumed absent from the habitats within the Tilbury Site.
Protected and/or Notable Plants (Volume VI – Appendix 7.9)	A vascular plant survey undertaken by Natural England in 2022 yielded records of a number of protected and/or /notable plants in the vicinity of the Tilbury Site, including stands of the following: - wormwood (<i>Artemisia absinthium</i>), annual beard grass (<i>Polypogon monspeliensis</i>) and narrow-leaved bird's-foot trefoil (<i>Lotus tenuis</i>) – scattered through southern field and ashfields to the east of the Site; - Low goosefoot (<i>Oxybasis chenopodoides</i>) found on edges of saline pools/drains; - Hairy vetch (<i>Vicia villosa</i>) – in track sides and grasslands in field south of the proposed Tilbury SEC. The 2023 vegetation surveys identified stands of narrow-leaved bird's-foot trefoil on the western boundary of the Tilbury Site within the strip of disturbed ground associated with the ditch that adjoins the existing Tilbury SEC.	Assemblage of protected and/or notable plant species at Tilbury Site	District	Threat status and rarity of the species recorded area as follows: - wormwood - Least concern (Historic decline) - annual beard grass – Least concern (Nationally scarce Great Britain) - narrow-leaved bird's-foot trefoil – Least concern (not listed) - Low goosefoot - Least concern (Nationally scarce Great Britain) - Hairy vetch – Neophyte (no status)
Invasive Non-Native Plant Species	Russian olive (<i>Elaeagnus angustifolia</i>) is present frequently within and surrounding the Tilbury Site. It has invasive characters but is not listed under Schedule 9 of the Wildlife and Countryside Act (1981 as amended).	Russian olive at Tilbury Site	N/A	Not subject to legal constraints but invasive species in nature.

Species/Species Group and Relevant Technical Appendix	Baseline Conditions	Ecological Features	Importance	Rationale
Marine Mammals	Thames and its banks and suitable for cetaceans and pinnipeds. The location of the proposed activities, had between 1 and 5 sightings per km ² during the 10-year period between 2004 and 2014.	Marine Mammal population utilising Thames Estuary	Regional	The wider Thames Estuary represent an important site for cetaceans and pinnipeds in a regional context. However, no works are proposed in the channel and the project will utilise existing jetty/port berths and established shipping lane to remove the total of approximately 80 barges of spoil. No impacts are expected and therefore receptor not considered further in the assessment.

Key Receptors

7.5.37 The key ecological receptors (i.e., Important Ecological Features) at Tilbury are outlined in Table 7-10, along with the rational.

Table 7-10: Summary of Important Ecological Features

Ecological Feature(s)	Importance	Considered further in this assessment (i.e., an IEF relevant to the Proposed Development)
Thames Estuary & Marshes SPA and Ramsar; Medway Estuary and Marshes SPA	International	Yes
Mucking Flats and Marshes SSSI	National	Yes
South Thames Estuary and Marshes SSSI	National	Yes
Swanscombe MCZ	National	Yes
Swanscombe Peninsula SSSI	National	No – 8.4km from the Site and no potential functional linkage
North Downs Woodlands SAC	International	Yes
Tilbury Power Station Local Wildlife Site LWS;	Up to National	Yes
Tilbury Marshes LWS; West Tilbury Church LWS; West Tilbury Hall LWS; Low Street Pit LWS	County	Yes
Canal and Grazing Marsh, Higham LWS	County	No – considered in the Gravesend chapter (Volume IV Chapter 15 Biodiversity - Gravesend)
Grassland/scrub/reed mosaic	District	Yes
Hardstanding and bare ground	Negligible	No
Ditches	Local	Yes
Habitats adjoining the Tilbury Site	Up to National	Yes
River Thames Estuary	Regional	No – no works in channel.
Bat Assemblage at Tilbury	Local	Yes
Intertidal bird assemblage at Tilbury	County	Yes
Non-breeding bird assemblage at Tilbury	Local	Yes
Breeding bird assemblage at Tilbury	Local	Yes
Great crested newt @ WB1, WB2, WB3 and WB6	Negligible	No
Reptile assemblage utilising Tilbury Site and adjacent habitats	County	Yes
Invertebrate assemblage utilising Tilbury Site and adjacent habitats	National	Yes
Badger population at Tilbury Site	Site	No
Water vole populations utilising WB1, WB3 and WB6	District	Yes
Otter populations at Tilbury Site	Negligible	No
Protected and/or notable plant species at Tilbury Site	District	Yes

Ecological Feature(s)	Importance	Considered further in this assessment (i.e., an IEF relevant to the Proposed Development)
Marine mammals	Regional	No – no works in the channel and use of established shipping lanes to transport spoil.

7.6 Key Parameters for Assessment

The Proposed Development

7.6.1 A detailed description of the Proposed Development is provided in ES Volume II Chapter 3 - Project Description. The following aspects of the Proposed Development relevant to this chapter comprise:

- The site preparation and construction work, especially:
 - Extent of vegetation clearance for permanent works;
 - Extent of vegetation management for temporary works;
 - Shaft and SEC locations;
 - Areas for plant maintenance, site offices and compound areas;
 - Methods and routes for spoil disposal;
 - Storage areas for construction and for excavated materials;
 - Indicating phasing and duration of works;
 - Acoustic disturbance from construction activities;
 - Dust generation;
 - Water generated by the construction process and routes of disposal; and
 - Lighting during preparation and construction.
- Land uses within the operational Proposed Development in particular:
 - New headhouse and Sealing End Compound and levels of associated operational activity;
 - New access roads and utilities;
 - New drainage; and
 - Lighting.

7.7 Mitigation

Embedded Mitigation

- 7.7.1 The following embedded mitigation has been taken into consideration when assessing the ecological impacts of the Proposed Development:

Design of the Proposed Development

- 7.7.2 As set out within ES Volume II Chapter 2: Alternatives, the design of the Proposed Development at Tilbury has sought to minimise impacts on both the existing Tilbury Power Station LWS and the proposed extension to the Mucking Flats and Marshes SSSI, through targeting the construction and storage activities to areas of existing hard-standing.
- 7.7.3 The location of the proposed tunnel shaft and associated Tilbury SEC was adjusted early in the design process to move it out of grassland habitats that fall within the Tilbury Power Station LWS and proposed SSSI extension, and instead utilise existing areas of hard-standing. This acted to minimise the loss of more valuable semi-natural habitats as a consequence of the Proposed Development, and in turn potential losses of reptile, invertebrate, bird nesting and foraging habitats. In addition, it acted to increase the distance between key noise generating activities associated with the tunnelling works and sensitive intertidal habitats utilised by wintering and passage birds, and thus reduce potential for disturbance of these bird populations during construction.
- 7.7.4 Spoil created by the tunnelling process will be disposed of by barge utilising either an existing berth at the Port of Tilbury or the existing Ingrebourne Valley jetty to the south-east of the proposed Tilbury SEC. This will minimise the potential for adverse impacts on both marine receptors and bird populations utilising the River Thames estuary through use of existing shipping routes and no requirement to construct a new project specific jetty.
- 7.7.5 Due to the range of ecological constraints at the Tilbury Site, in order to balance considerations of all constraints it is not possible to entirely avoid impacts on areas of tall fescue dominated grassland that support the tall fescue planthopper, a RDBK and Species of Principal Importance. However, the design of the Proposed Development has sought to minimise habitat losses for this species as follows:
- The majority of the tall fescue dominated north-south orientated road verge on the western margin of the proposed Tilbury SEC will be retained. Trenching works within the verge will be confined to the first 3m adjoining the existing road (loss of approx. 300m²), with spoil removed to avoid impacts on the remainder of the suitable habitat in the verge and maintain connectivity through this section of verge; and
 - The majority of the margin of tall fescue dominated habitat which surrounds the area of hardstanding used currently for car storage will be retained. Areas removed will be limited to:
 - one 10m cut through (approx. 100m²) in the verge on the northern edge of the hardstanding slab to install a new north-south temporary access track. Two alternative locations are still under consideration as shown in Figure 7-4, but only one of these will be cleared;
 - clearance of approximate 0.2ha (2000m²) to the west of the north-south access road to enable linkage between the proposed Tilbury SEC and the adjacent hardstanding that will be utilised as a construction compound and spoil storage.
- 7.7.6 All of the above areas will be reinstated to similar areas of tall fescue dominated tussocky grassland following completion of construction (approx. 4 years).
- 7.7.7 The land required for the Proposed Development at Tilbury includes large areas of habitat within the fields to the north and south of the proposed Tilbury SEC. The majority of this land is required on a temporary basis only to facilitate the de-stringing and removal of overheads lines (southern field), or

realignment of existing overheads (northern field) to link into the new facility. These works will be temporary in duration and are assumed to consist of the following:

- De-stringing is likely to require minimal vegetation clearance. Access will be required to the existing SEC and pylons, and cables will be lowered to ground level where they will be rolled up and removed.
- Re-alignment of existing overheads will involve the removal of one existing pylon to the northeast of the proposed SEC, and creation of a single new replacement pylon towards the middle of the same field. Creation of the pylon will require the creation of a crane pad to enable a crane to safely enter the area and erect the pylon. This will require vegetation clearance and ground disturbance within an area of approximately 0.4ha around the pylon base;



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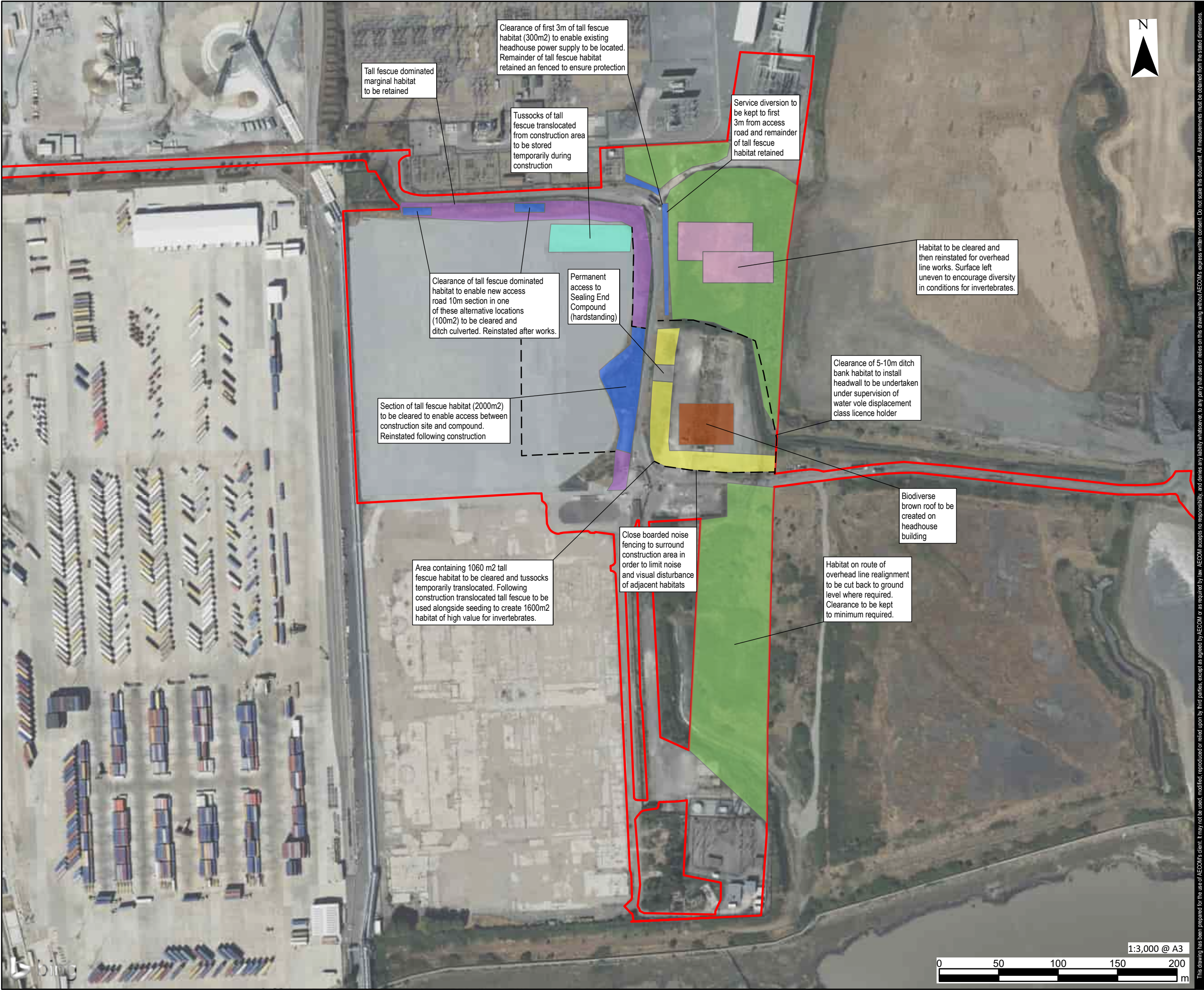
LEGEND

 Red Line Boundary (Above Ground)

 Extent of Key Areas of Tall Fescue
Planthopper Habitat

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Figure 7.3



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PROJECT

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LEGEND

Red Line Boundary (Above Ground)

Ecological Mitigation Plan

Close boarded noise fencing during construction (indicative)

Biodiverse brown roof

Habitat to be cut back to ground level as required to enable overhead line realignment

Habitat to be lost and then reinstated for overhead line works

Retained habitat

Tussocky grassland habitat to be created following construction

Temporary storage of translocated tall fescue tussocks during construction

Area of tall fescue to be cleared and reinstated after construction

Hardstanding

NOTES

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ISSUE PURPOSE

Environmental Statement

PROJECT NUMBER

60677311

FIGURE TITLE

Ecological Mitigation Measures

FIGURE NUMBER

Figure 7.4

- The erection of the new cables in the northern field will require rolling out the new cables through the areas of retained grassland which they will over sail. This operation will be undertaken by hand to limit the disturbance of these habitats. Habitats along the cable alignment will be retained, but where necessary above ground vegetation will be sensitively strimmed back to ground level as required to avoid cables becoming tangled with the vegetation. It is likely that only a small percentage of the overall area included in the temporary working area (see Figure 4) will require clearance. Vegetation clearance will adhere to the Precautionary Method of Working (PMoW) for reptiles and breeding birds, and will be agreed with the supervising Ecological Clerk of Works (ECoW);
- Following the completion of construction all areas of temporary habitat loss will be reinstated to areas of similar habitat. Both the grassland verge and field to the north of the proposed SEC support rough grassland habitats that have largely developed through natural colonisation, and based on the high invertebrate value of the surrounding areas the Contractor will be directed to ensure reinstatement leaving a varied topography incorporating vehicle ruts and gentle scrapes and mounds, and exposing sub-soil layers in some areas to encourage areas of less vigorous vegetation growth.

7.7.8 The design of the Proposed Development includes an Outline Landscape and Ecology Management Plan (LEMP) which incorporates the following habitat creation features:

- **680m² biodiverse brown roof:** this will be provided on the proposed Tilbury headhouse building and will utilise low nutrient substrate growing medium (where possible from the Site). As far as the final design allows the depth of substrate should vary across its extent between approximately 80mm and 150mm. A variety of substrates will also be introduced in order to maximise niches available for invertebrates (e.g., piles of sand; pebbles; and logs) in order to provide niches for a range of invertebrates. The brown roof will be sown at a low density (approx. 2g/m²) with seed collected from the surrounding Tilbury area with the aim of providing brownfield habitat of value for a range of invertebrate species. The seeding rate will intentionally be kept very low to allow an element of natural colonisation and maintain areas of bare ground; and
- **0.16ha (1600m²) semi-natural tussocky grassland:** small verges to the south and west of the proposed Tilbury SEC will be created following construction of the Tilbury SEC compound. These areas of habitat will seek to provide areas of tussocky grassland of value to the local invertebrate assemblage including tall fescue planthopper. The surface will be gently undulating to provide structural complexity and the area will be sown with a low density (approx. 2g/m²) of seeds collected from surrounding areas, to include tall fescue. The seeding rate will intentionally be kept very low to allow an element of natural colonisation and maintain areas of bare ground.

7.7.9 An appropriate monitoring programme for during (where relevant) and post-construction will be formalised and agreed as part of the planning application and included within the detailed LEMP. At the Tilbury Site this is likely to include monitoring for invertebrate populations and reptiles.

Construction Environmental Management Plan

7.7.10 The Outline Construction Environmental Management Plan (CEMP) (ES Volume VI - Appendix 3.1) summarises the types of mitigation measures that will be considered to mitigate against the effects of the Proposed Development.

7.7.11 The following general environmental management controls will be secured as part of the CEMP, and are considered relevant to the assessment:

- Provide all employees, site operatives and personnel with pollution awareness induction training and regular toolbox talks covering environmental issues;
- Closed board fencing would be installed around the construction compounds;
- A set of generic best practice working methods referred to as Best Practicable Means (BPM) would be employed during the construction phase. Typical BPM are outlined below, which would be refined as individual commitments in the Final CEMP:

- Unnecessary revving of engines will be avoided, and equipment will be switched off when not in use;
 - Appropriate routing of construction traffic on public roads and along access tracks;
 - Drop heights of materials will be minimised;
 - Plant and vehicles will be sequentially started up rather than all together;
 - Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading will also be carried out away from such areas; and
 - Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications.
- implement the range of air quality measures set out in the OCEMP designed to ensure dust suppression during construction;
 - Site clearance will be kept to a minimum and there will be a 10 m buffer around all water features. (e.g., using temporary exclusion fencing, fabric silt fences, straw bales, maintaining vegetation etc.) other than at crossings or where there are specific tasks that need to be undertaken close to a water features. Similarly in other areas of sensitive retained habitat, such as where works adjoin areas of retained tall fescue planthopper habitat physical barriers (herras fencing or similar) will be erected to prevent encroachment during works;
 - Appropriate separate storage of topsoil/subsoil and materials, and at least 20 m from water Features on flat ground;
 - The implementation of a temporary drainage system and other measures to manage pollution risk during construction (e.g., fabric silt fences, lagoons, bunds, straw bales, sandbags, lamella clarifiers or other proprietary measures as may be required) etc
 - If discharging water to a nearby watercourse, the rate of discharge will need to be agreed with the relevant authority to ensure that there is no unacceptable increase in flood risk or risk of scour. Any discharge will need to be undertaken with the agreement of the relevant statutory regulator and will need to comply with the pollution prevention requirements set out in the final CEMP.
 - Lighting – construction lighting will be minimised, and where required efforts made to direct lights downwards and away from sensitive receptors and minimise light spill into adjacent areas; ensuring that lighting is turned off when not required;
 - The use of lighting will be minimised to that required for safe site operations and security;
 - Lighting will utilise directional fittings to minimise outward light spill and glare (e.g., via the use of light hoods/cowls which direct light below the horizontal plane, preferably at an angle greater than 20° from horizontal); and
 - Lighting will be directed towards the middle of the Tilbury Site rather than towards the boundaries.

7.7.12 In addition, the OCEMP includes the following biodiversity specific embedded measures that will be secured:

- The Ecological Clerk of Works (ECOW) will complete a walkover pre-construction to reconfirm the ecological baseline conditions and to identify any new ecological risks;
- Prior to the commencement of site clearance a precautionary method of works (PMoW) to cover pre-construction site clearance works will be developed and implemented. This will include consideration of the following:
 - **Reptiles** – all widespread reptile species are known to occur at Tilbury. Phased vegetation clearance to displace reptiles into areas of suitable adjacent habitat, alongside hand searching by an ecologist/supervised destructive clearance will be

required in areas of suitable reptile habitat. Clearance works should be undertaken during the period March to October inclusive under suitable weather conditions. Ideally clearance works will target March, September and October in those areas of the Site with potential to support nesting birds.

- **Birds** – Vegetation clearance should wherever possible (including consideration of other species constraints) be targeted to be undertaken during the period September to February inclusive.
- **Badgers** – are known to be active in the local area. While no setts within either the Site boundary are known, the Site and a surrounding 30m buffer should be checked for presence of new setts by an ecologist prior to and during site clearance works.
- **Water vole** – are known to utilise the ditch to the east of the proposed Tilbury SEC and have been recorded previously in the ditch that will be crossed by the 10m cut-through to construct the new access road (see Figure 17-4). As the areas of habitat to be impacted are small (5-10m stretch) suitable sections of ditch not supporting burrows will be identified by a water vole holder of a CL31 licence to displace water vole. Where necessary habitat manipulation will be undertaken under licence in advance of the works to displace water vole from a 5-10m section of bank to allow the works to be undertaken without disturbing active burrows;
- **Protected plant species** – the ECOW will undertake a search of all areas to be disturbed during works for notable rare/plant species and where found their locations will be clearly demarked to enable them to be avoided during works;

The draft PMoW will be shared with key consultees such as the planning authorities, Port of Tilbury, Buglife and Natural England for their comment prior to being implemented.

- The main construction areas should be encircled with close boarded noise fencing to minimise the risk of disturbance of adjoining habitats suitable to support a range of notable nesting birds. It is expected the layout and design of fencing will require local authority approval via a planning condition.
- A 5m width buffer of semi-natural habitat will be retained adjoining all ditches during construction. No works will be permitted within this buffer zone and the boundary will be marked by fencing to prevent incursions into this zone. The design of the Proposed Development will ensure no degradation in the quality of existing habitats.
- An invasive non-native species management plan will be drafted and implemented to include safe means of removal and disposal of any areas of Russian olive impacted by the Proposed Development.
- To ensure compliance with relevant wildlife legislation, pre-construction surveys to check for the presence of invasive non-native species will be undertaken prior to the commencement of vegetation clearance works.
- The Contractor will provide a Biodiverse Brown Roof for the headhouse buildings. The Contractor is to follow best practice guide (Ref 7-22) provided by invertebrate charity, Buglife, on the specific specification of the roof. This is to be agreed with National Grid.

Operational Embedded Measures

Lighting during operation will be managed to ensure it is avoided wherever possible, and where required sensitive design ensures that spillage into adjacent habitats is minimised. Lighting design will be undertaken in accordance with the Bat Conservation Trust and Institute of Lighting Engineer's Guidance Note 08/23 (Ref 7-45 Air Pollution Information System. Available at <https://www.apis.ac.uk/>

- Ref 7-46).

7.8 Potential Impacts

Introduction

- 7.8.1 This section identifies that prior to mitigation the following potential impacts (positive and negative) on IEF's could arise as a consequence of the construction and operation of the Proposed Development at the Tilbury Site.

Potential impacts during construction

- **Habitat loss/gain** – a permanent loss or gain of habitat as a result of the Proposed Development;
- **Habitat degradation** – direct or indirect impacts resulting in the reduction in the condition of retained habitats within or adjoining the Proposed Development, and its suitability for some or all of the species it supports.;
- **Species mortality** – direct impacts on species populations due to potential for killing/injury during site clearance operations. For example, site clearance activities;
- **Species disturbance/displacement** – indirect impacts resulting from a change in normal conditions (light, noise, vibration, human activity) that result in individuals or populations of species changing behaviour or range;
- **Fragmentation/connectivity of populations or habitats** – indirect impacts by dividing or enhancing connectivity between a habitat, group of related habitats, site or ecological network, or the creation of partial or complete barriers to the movement of species, with a consequent impairment of ecological function;
- **Introduction/spread of invasive species** - the movement of personnel, equipment and plant machinery, potentially facilitates the introduction of invasive species.

Potential Operational Effects

- 7.8.2 The following additional operational impacts and associated effects may occur:
- **Habitat degradation/disturbance** – potential for indirect impacts associated with operational lighting which may reduce the suitability of adjoining habitats for bat and bird populations. In addition, permanent increases in human activity associated with ongoing operation of the headhouses and SECs could reduce the suitability of adjacent habitat for use by nesting and foraging birds.

7.9 Assessment of Effects

- 7.9.1 The following assessment of ecological effects has been undertaken assuming the implementation of the embedded mitigation measures set out Section 7.8, and included within Figure 7-4.

Construction Phase

Designated Sites

Thames Estuary and Marshes SPA and Ramsar/Mucking Flats and Marshes SSSI

- 7.9.2 Details of the qualifying features and conservation objectives for the Thames Estuary and Marshes SPA and Ramsar site (also designated as SSSI) are provided in Volume VI – Appendix 7.10. The results of noise modelling undertaken are provided in the Report to inform Habitat Regulations Assessment Test of Likely Significant Effects.
- 7.9.3 Due to the particular focus on the intertidal zone flagged by Natural England in early discussions over this project (as potential supporting habitat for the species for which the SPA/Ramsar is designated), baseline noise measurements for the crest of the beach (the path just above the mudflats) were modelled and are presented in Table 7-11. The area on both sides of the river is relatively noisy due to its industrial setting. As a result, although the LAeq⁸ noise levels are relatively low the LMax⁹ levels are fairly high. During the daytime this includes frequent (i.e., recorded multiple times during 1hr) brief noise events averaging 70 db at Tilbury. This indicates a very variable baseline noise environment with considerable fluctuations. At night the average and maximum noise levels are lower as expected, being 46dB (LAeq) and 63 (LMax) at Tilbury.
- 7.9.4 Note that the LMax is not the single loudest noise event during the 24hr recording period. It is the average of the LMax for each 5-minute recording block over the 24hr recording period. Therefore, noise levels of 70dB are frequently experienced on the foreshore (at least every 5 minutes).
- 7.9.5 Specific noise monitoring has not been undertaken at the location of the ringed plover raft 390m east of the tunnel compound. However, the general baseline noise environment is likely to be very similar to that at the Tilbury foreshore monitoring location.

Table 7-11: Baseline sound levels

Location	Day		Night	
	LAeq,T dB	LAFmax dB	LAeq,T dB	LAFmax dB
Tilbury	45	70	46	63

- 7.9.6 The construction phases of the Proposed Development are summarised in ES Volume II Chapter 3. Most works will be undertaken during the day. The exception is during the tunnelling phase at Tilbury when the treatment plants in particular will run 24hrs. If noise levels do not exceed the baseline, then they will not be audible as distinct noises. While the quality of a noise can also be relevant, the distance of the Proposed Development works from the foreshore or inland ringed plover raft (360-390m) and the nature of the existing noise environment, with considerable influence from human activity, mean that the quality of the noise created during works will not be materially different from the existing soundscape.
- 7.9.7 Comparison with the baseline levels presented in Table 7-11 shows that at Tilbury the mudflats will be subject to an average noise level due to the works of up to 45dB. This would occur during Phase 1 (Site Set Up). During the later phases the noise level at the mudflats is forecast to be lower being 35-40dB. In other words, the average noise levels at the mudflat will be at or below the current baseline levels and thus not audible above them. Moreover, due to the presence of other sensitive nesting bird species in the general area the embedded mitigation measures provided a part of design of the Proposed Development include the provision of close board noise-fencing to surround the

⁸ Equivalent continuous sound level

⁹ The maximum sound level reached during a measurement period

construction site. This will reduce noise levels by approximately 10dB meaning that the average noise levels experienced across the foreshore will be well below current baseline levels.

- 7.9.8 The LA_{max} levels at the foreshore from all phases at Tilbury are forecast to be well below the baseline LA_{max} levels at the foreshore, with the highest levels during use of the breaker. An LA_{max} of 45dB (with occasional areas reaching 50dB at the crest of the beach) is forecast at the foreshore during these operations, which is well below the baseline foreshore LA_{max} of 70dB. With the noise fencing introduced to protect other features in place, the LA_{max} will be 35-40dB, at least 30dB below the baseline (i.e., six times quieter).
- 7.9.9 In addition to the intertidal zone, the raft identified in the Thurrock Flexible Generation Plant DCO ES approximately 390m east of the Proposed Development's construction site which supported nineteen ringed plover would, with the noise fencing introduced to protect other features, be subject to similar noise levels to the foreshore during works i.e., 30-35dB LA_{eq} and LA_{max} levels well below the recorded baseline and therefore not audible above the baseline.
- 7.9.10 During Phase 3 (tunnelling), there will be noise generated at night due to the 24hr operation of the treatment plants. For simplicity it is assumed that noise levels at night during Phase 3 will be similar to those during the day, although in practice it is likely less noise would be generated. During Phase 3 average noise levels of 40-45 dB LA_{eq} would be generated at the foreshore and at the ringed plover raft inland. Without mitigation they would therefore be a minimum of 1 dB lower than baseline levels. Taking account of the noise fencing introduced to protect other features, they would be a minimum of 11dB lower than baseline levels and therefore would not be audible above the baseline.
- 7.9.11 It can therefore be concluded that birds using the mudflats, or the ringed plover using the raft 390m east of the Proposed Development on the Tilbury side, will not be disturbed by noise associated with construction of the tunnel at Tilbury.
- 7.9.12 The closest that construction works associated with the tunnel will take place to the intertidal zone at Tilbury is 360m to the north (and 2.3km to the west of the SPA/Ramsar site), while the closest to the ringed plover raft inland is 390m. This is sufficiently distant that with the assumed CEMP controls in place construction lighting is not expected to perceptibly change light levels at any location.
- 7.9.13 The depth of the tunnel under the river, at the deepest invert level, will be -34.434m at the Tilbury Shaft. The substrate in which the tunnel will be installed is chalk. At a depth of approximately 30m under the River Thames, within a bedrock substrate, tunnel construction will not result in any surface noise or vibration impacts of effects on the water column. As such, there will be no indirect effects from the tunnel boring process on the river 30m above, or the SPA between 600m and 2.3km downstream.
- 7.9.14 Best practice water pollution controls will be implemented as part of the outline CEMP such that with these measures in place no water course pollution that would impact the SPA/Ramsar are expected.
- 7.9.15 As discussed in ES Volume II Chapter 3 paragraph 3.4.17 while it is National Grid's preference to power the Tunnel Boring Machines (TBMs) using a grid connection. However, in case this is not possible the assessment has considered a worst-case scenario whereby two to three diesel generators are required.
- 7.9.16 Under this scenario generators would be required to power the TBMs over a 34 week period which will equate to 25 weeks with generators running 24hrs a day, with the remaining 9 weeks consisting of down time. While NO_x deposition levels at the SPA/Ramsar site would increase for this period the contribution of the Proposed Development would remain less than 1% of the Critical Load.
- 7.9.17 The Proposed Development will seek to dispose of the majority of the spoil from the Tilbury Site via barges. The boundary of the Tilbury Site includes provision for use of either an existing berth within the Tilbury 2 Port, or the existing Ingrebourne Valley jetty approximately 1.9km upstream of the Thames Estuary & Marshes SPA/Ramsar Site. On a precautionary basis, it is assumed for the purposes of assessment that all material is removed from the Ingrebourne Valley jetty (the closer to the SPA/Ramsar). No changes to existing lighting of the jetty will be required since no nocturnal barge movements will be associated with the project. Since this is an existing jetty being used by an

aggregate company to bring in spoil from other projects, the wader and waterfowl population of the area are habituated to the use of this jetty, and this will not be materially changed by the project.

- 7.9.18 The forecast number of barge movements equates to one two-way barge movement every 2.5 days on average i.e., very low given how busy the tidal River Thames is as a shipping channel, and the main shipping channel out to the Thames Estuary is a minimum of 400m from the SPA/Ramsar site. All the roads used to access the construction site also lie over 2km from the SPA/Ramsar site. Since traffic only has a potential significant impact on nitrogen deposition and associated air pollutants when location within 200m of a European site¹⁰, no notable adverse effects are expected.
- 7.9.19 Based on the above and those described in Volume II – Chapter 15 : Biodiversity -Gravesend, overall the impacts of the Proposed Development are not likely to result in any significant effect on the structure and function of the Thames Estuary & Marshes SPA and Ramsar Site or the Mucking Flats and Marshes SSSI.
- 7.9.20 It is understood that Natural England is considering an extension to the Mucking Flats and Marshes SSSI, which could include some of the habitats within the Tilbury Site. While Natural England have shared the extent of the area that is being considered for inclusion, Natural England have yet to commence the formal process of notifying the interested parties of the proposed new extent, and confirming the reasons for the inclusion of each land parcel. As a consequence, it is not considered possible (or appropriate) at this stage to undertake an assessment of the impacts of the Proposed Development on the structure and function of the expected SSSI extension. As a precaution, the likely designation of these habitat areas have been considered when evaluating the importance of the underlying habitat and species populations/assemblages that those areas earmarked for designation are known to currently support.

Medway Estuary and Marshes SPA

- 7.9.21 The Medway Estuary and Marshes SPA is located approximately 9.9km from the Tilbury Site, and similar to the Thames Estuary and Marshes SPA and Ramsar supports a diverse mixture of habitats and bird populations. It is located further from the Tilbury Site than the Thames Estuary and Marshes SPA, with similar sensitivities.
- 7.9.22 Based on the same rationale as presented for the Thames Estuary and Marshes SPA and Ramsar any impact on the bird populations for which the SPA/Ramsar is designated are likely to be negligible. Therefore, no significant effect on the structure and function of the Medway Estuary and Marshes SPA is expected.

Swanscombe Peninsula SSSI

- 7.9.23 The Swanscombe Peninsula SSSI is located approximately 1660m to the west of the existing berth at Tilbury Port that may be utilised for spoil disposal by barge. The SSSI is located approximately 5km from the proposed Tilbury SEC and on the opposite side of the Thames to proposed works at Tilbury. No significant effect on the structure and function of the Swanscombe Peninsula SSSI is expected.

Swanscombe MCZ

- 7.9.24 The Swanscombe MCZ is located 2.2km to the north-west of the existing berth at Tilbury Port that may be utilised for spoil disposal by barge. If this route for spoil disposal it would involve use of an existing consented facility and all works would be undertaken in accordance with regulations governing the operation of the existing port. As such no changes from the existing baseline conditions are expected.
- 7.9.25 Even if this location is utilised no barge movement to the west of the existing port are expected as all receptor sites for the material being considered are located to the east of the Proposed

¹⁰ See [Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations - NEA001](#) and [air-quality-impacts-on-nature-sites-2019.pdf \(iaqm.co.uk\)](#)

Development. As a consequence, no impacts (or resultant significant effects) upon the structure and function of the Swanscombe MCZ are expected.

Tilbury Power Station LWS

- 7.9.26 The Proposed Development at the Tilbury Site will not result in any permanent loss of habitat from the Tilbury Power Station LWS. However, approximately 0.4ha of the rough grassland/scrub mosaic to the south of the proposed Tilbury SEC will be temporarily modified to enable the removal of existing overhead lines. The works are expected to take approximately 12 weeks to complete and will involve existing overhead lines being lowered to ground level before being cut to manageable pieces and rolled up by hand. Where feasible vegetation clearance will be avoided, however it will likely be necessary in some areas to cut back woody vegetation and scrub in order to avoid the cables becoming entangled.
- 7.9.27 For the purposes of assessment, a worst case is assumed of cutting back to ground level of a corridor 5m either side of the current overhead line alignment, totalling a maximum of 1.4ha. Even if the full extent required clearance (which is highly unlikely to be the case) this would only amount to approximately 3% of the wider LWS (48.8ha). The value of this area for some species would be temporarily downgraded during the line removal works, but large areas of similar or higher quality alternative habitat would remain accessible to the reptile, invertebrate and bird populations that this area supports.
- 7.9.28 The corridor below the existing overhead lines and within 5m of it would be subject to temporary (approximately 12 weeks) disturbance by vegetation clearance and vehicles required to remove the cables. The remainder of the works associated with the tunnelling and SEC construction will occur adjacent to the LWS, and will be mitigated by the CEMP and installation of a noise fence which will act to reduce disturbance of habitats to those immediately adjacent to the construction area, a small proportion of the overall LWS.
- 7.9.29 Assuming that the works are undertaken in accordance with the embedded mitigation measures set out in Section 7.7, the effect of these changes are likely to be reversible within 12 months of the works through natural regeneration.
- 7.9.30 The construction of the Proposed Development will occur in close proximity to the built-up plateau of PFA to the east of the Tilbury Site that forms part of the LWS. This area of habitat supports the Habitat of Principal Importance Open Mosaic Habitat on Previously Developed Ground, and is also known to be of high importance for the invertebrate assemblage which it supports. The habitats in the plateau area are very unusual in nature due to their man-made nature and the low fertility PFA material used in its construction.
- 7.9.31 Under a worst-case scenario for assessment purposes if a grid connection cannot be secured then diesel generators would need to be utilised to power the Tunnel Boring Machines (TBMs). Under this scenario generators would be required to power the TBMs over a 34 week period which will equate to 25 weeks with generators running 24hrs a day, with the remaining 9 weeks consisting of down time.
- 7.9.32 Prior to any further mitigation, the use of diesel generators to power the TBM's would result in highly elevated levels of nitrogen deposition across the PFA plateau throughout the tunnel boring duration of approximately 34 weeks (9 months). Due to the unusual origin and artificial nature of these habitats there is no prescribed Critical Load for this habitat type. On a precautionary basis a Critical Load of 10kgN/ha/yr has been assumed.
- 7.9.33 During the 34 week period for tunnelling works these areas of habitat would prior to mitigation (5m stack height) be subject to NOx deposition amounting to up to a 19% contribution to the Critical Load for the LWS, and up to 91% of the contribution for land to the west of the Tilbury Site, which is outside of the existing LWS but within the area being considered for SSSI designation. Nitrogen deposition at the LWS will prior to mitigation be up to 6% of the Critical Load and up to 28% for the additional areas of land to the west of the Site being considered for SSSI designation.

- 7.9.34 Over an extended duration nitrogen deposition at these levels could result in adverse impacts on the composition of plant communities within the existing nutrient limited habitats. In particular, promoting the growth of coarse grasses and ruderal species, that could reduce the diversity of other botanical species, and in turn adversely impact the invertebrate communities it supports. However, critical levels and loads are annual average rates and are intended for consideration of longer-term changes in deposition over years rather than months. The increase in nitrogen deposition will in this case occur over a temporary period of 9 months.
- 7.9.35 The Air Pollution Information System (APIS) (Ref 7-45) was queried to establish historic nitrogen deposition rates, and consider the historic trend data for the nitrogen deposition levels data since this area of habitat was created (understood to be 2013/2014). As a guide nitrogen deposition trend data for the local area for moorland/short vegetation were reviewed as the closest fit to the open mosaic habitats present. In 2013, a nitrogen deposition rate of 14.3 Kg/N/ha/yr was recorded. Subsequently deposition rates dropped year on year until 2016 (13.8 Kg/N/ha/yr), followed by higher rates in 2017, 2018 and 2019 (all above 15 Kg/N/yr), before dropping back to 13.9 Kg/N/yr in 2020.
- 7.9.36 This data indicates that the nitrogen deposition rates over this period when the valuable habitats within the PFA plateau have been establishing have often been well above the current levels. Given that the habitats of interest have developed under these conditions it suggests there is no reason to believe that the temporary (9 month) increase in nitrogen deposition that would occur during construction is likely to affect the persistence of the communities of interest. However, on a precautionary basis in the absence of further mitigation it is assumed there would be the potential for a temporary adverse effect on the structure and function of the LWS at up to the Local level only which would not be significant.

Tilbury Marshes LWS

- 7.9.37 The Tilbury Marshes LWS is designated on the basis of its relic grazing marsh habitat, scarce plant species and important invertebrate communities. It is located 0.6km from the site access roads that have been included within the Tilbury Site, but is approximately 750m from the areas that will be subject to construction works. Given the industrial nature of the surrounding area, assuming the implementation of the CEMP measures no effect on the structure and function of the LWS is expected.

Other non-statutory designated sites

- 7.9.38 All other non-statutory designated sites to the north of the Thames are more than 1km from the Tilbury Site. With the implementation of the embedded mitigation measures, based on the nature of the proposals and their distance from the Tilbury Site, no adverse effects upon the structure or function of any other non-statutory designated sites are expected.

Habitats

Grassland/scrub/reed mosaic

- 7.9.39 The construction of the Proposed Development is expected to result in the following habitat losses/modifications at the Tilbury Site:
- Temporary loss of approximately 0.1ha (1060m²) of tall fescue dominated rough grassland from the verge on the western margin of the proposed Tilbury SEC, and to provide access points to the adjoining hardstanding slab to be utilised for laydown/storage (see Figure 7-4);
 - Temporary loss (approx. 4 years) of 0.2ha (2000m²) section of tall fescue dominated habitat surrounding the larger hardstanding area to enable access between the proposed Tilbury SEC and the adjoining compound;
 - Temporary loss (approx. 4 years) of one section of tall fescue dominated road verge measuring approximately 10m x up to 10m (100m²) where a cut through will be created to enable the new site access road;

- Temporary loss (up to 4 years) followed by reinstatement of approximately 300m² of tall fescue dominated rough grassland along the road verge to enable existing power cables in the verge to be removed and upgraded. Trenching works will restrict impacts to the first 3 metres of the verge adjoining the road;
- Temporary loss (works duration approx. 12 weeks) followed by reinstatement of approximately 0.4ha within the rough grassland and reed dominated field to the north of the proposed Tilbury SEC to allow the construction of a crane pad required to remove existing, and constructed a replacement pylon tower;
- Temporary modification/cutting back to ground level of up to 1.4ha rough grassland and scrub in field to the south of the proposed Tilbury SEC for removal of existing overhead lines (works duration approx. 12 weeks);
- Temporary modification/cutting back to ground level of approximately 0.9ha rough grassland/reed and scrub in field to the north of the proposed Tilbury SEC for realignment of existing overhead lines(works duration approx. 12 weeks); and
- Minor cutting back of existing scrub and grassland vegetation adjoining the existing hardstanding slab that will become the SEC, to enable the installation of a boundary fence (works duration up to 6 weeks).

7.9.40 Following the completion of construction all areas of temporary habitat loss will be reinstated. Both the grassland verge and field to the north of the proposed SEC support rough grassland habitats that have largely developed through natural colonisation, and based on the high invertebrate value of the surrounding areas the Contractor will be encouraged to ensure reinstatement leaving a varied topography incorporating vehicle ruts and gentle scrapes and mounds, and exposing sub-soil layers in some areas to create areas of less vigorous vegetation growth.

7.9.41 In combination with the areas subject to overhead line removal or realignment that will be subject to some cutting back of vegetation (as required), these changes are likely to add structural diversity to the areas of grassland/scrub/reedbed mosaic habitat, and introduce more varied habitat conditions to those currently present in these areas, which are succeeding to closed sward communities of scrub and rough grassland due to recent lack of disturbance.

7.9.42 As stated in Section 7.7 following completion of construction the provision of landscape planting around the new SEC will provide approximately 0.16ha of tussocky grassland habitat, a gain of approximately 540m² compared to the extent of grassland habitat in this area prior to construction. This area will aimed to support a similar range of species to those currently present in the surrounding areas of grassland.

7.9.43 For assessment purposes it is assumed that diesel powered generators may be required at Tilbury to power the Tunnel Boring Machine (TBM). These would be required to operate 24hrs a day for approximately 8 months of the year during the construction period. Air quality modelling set out in Volume III Chapter 12 indicates that there is the potential for high oxides of nitrogen (NO_x) deposition within the vicinity of the generators. However, this is not considered an issue for the habitats within the Site (predominately rough grassland, scrub and reedbed) given that they are not considered particularly susceptible to nitrogen deposition.

7.9.44 Overall, following the implementation of proposed mitigation it is expected that the Proposed Development will during construction result in a temporary (approximately 4 years) adverse effect on the habitats at the Site level that is not significant. Following reinstatement and establishment this effect will be reversible and within 12 months of completion of construction the increased structural diversity of the mosaic habitats is expected to represent a temporary beneficial effect at the Site level that is not significant for the following 1-2 years.

Ditches/Drains

7.9.45 Minor works will be required to two ditches. In order to provide a realigned site access road during construction an approximately 10m section of seasonally wet ditch to the north of the large

hardstanding slab (see Figure 7-4), will be temporarily culverted (approx. 4 years). The culvert will be removed and ditch reinstated following works.

- 7.9.46 In addition, an approximately 5-10m section of the ditch to the east of the proposed Tilbury SEC will require small scale works to install a headwall to enable surface water run-off into the ditch during operation. The permanent structure will be 1-2m in size and therefore any permanent habitat loss is negligible.
- 7.9.47 All remaining ditches within and adjacent to the Tilbury Site will be retained along with a minimum 5m buffer of adjoining habitat.
- 7.9.48 No discharge to existing ditches is to be undertaken during construction the implementation of pollution controls included in the CEMP these measures will act to ensure their value is maintained during construction.
- 7.9.49 During construction there will be a temporary (approx. 4 years) adverse effect on the conservation status of ditch habitat at the Site level which is not significant. Following removal of the temporary culvert the long-term effect will reduce to neutral and not-significant.

Adjoining Pulverised Fuel Ash Plateau

- 7.9.50 The construction of the Proposed Development will occur in close proximity to the built-up plateau of PFA to the east of the Tilbury Site that was created as part of the ecological mitigation for previous developments. As discussed in paragraphs 7.9.30 and 7.9.31, in relation to the Tilbury LWS this area of habitat would be subject to high levels of nitrogen deposition if diesel generators were to be used to power the TBM.
- 7.9.51 This area of habitat supports the Habitat of Principal Importance Open Mosaic Habitat on Previously Developed Ground and is also known to be of high importance for the invertebrate assemblage which it supports. The habitats which the plateau area are unusual due to their artificial nature and the low fertility PFA material used in its construction.
- 7.9.52 During excavation of the tunnel (approx. 34 weeks or 9 months) diesel generators adjoining the shaft would operate 24 hours per day for approximately 25 weeks, with the remaining 9 weeks consisting of down time.
- 7.9.53 Due to the unusual nature of the habitats there is no prescribed Critical Load for this habitat type. On a precautionary basis a Critical Load of 10kgN/ha/yr has been assumed.
- 7.9.54 As described in paragraphs 7.9.34 to 7.9.36, while the contribution of the Proposed Development will be more than 1% of the Critical Load it is considered unlikely that the short term increases will affect the persistence of the communities of interest. On a precautionary basis in the absence of further mitigation it is assumed there would be the potential for a temporary adverse effect on conservation status of the open mosaic habitat at up to the Local level only which would not be significant.

Species

Bats

- 7.9.55 The Proposed Development will not result in the loss of any confirmed roosts or trees/buildings with suitability to support roosting bats.
- 7.9.56 Habitats within and adjacent to the Tilbury Site are suitable for use by foraging/commuting bats, but 2023 surveys identified that the area is predominately used by more widespread bat species in particular common pipistrelle and soprano pipistrelle.
- 7.9.57 The small areas of permanent habitat loss associated with the construction of the Tilbury SEC and the areas that will be temporarily impacted due to the construction of the new pylon and associated restringing works represent a very small percentage (less than 1%) of the total suitable foraging habitat within a surrounding 100m radius. The impacts on habitat availability for bats during construction is therefore negligible.

- 7.9.58 Any impacts on bats utilising the habitat at the site for foraging and/or community during construction will be temporary (approximately 4 years) and minimised by the implementation of outline controls within the CEMP aimed at minimising construction lighting and reducing light spill into adjacent habitats. Following these controls, it is expected that there will be a temporary adverse effect at the Site level that is Not Significant.
- 7.9.59 Following the implementation of these measures no significant effect on the bat assemblage utilising the Site is expected to occur during construction.

Birds

Intertidal wetland birds

- 7.9.60 The areas of intertidal habitat adjoining the Tilbury Site are utilised by a number of the species for which the nearby Thames Estuary and Marshes SPA and Ramsar are designated. In particular, during the 2022/2023 surveys seven species (gadwall; little egret; avocet; whimbrel; black tailed godwit; dunlin; and redshank) had peak counts exceeding 1% of the SPA/Ramsar populations. Taking into considerations surveys undertaken for other recent large infrastructure projects in the area there has been no strict pattern in the way that individual SPA/Ramsar species are utilising the intertidal habitats in the immediate vicinity of the Tilbury Site (i.e., species are not shown to be consistently favouring use of the same locations). However, in almost all cases peak counts utilising those areas intertidal habitats immediately adjacent to the Site have been relatively low, with higher numbers utilising habitats to the east of the Tilbury Site. Use of terrestrial habitats within the Site by both SPA/Ramsar species and other intertidal wetland birds has been minimal.
- 7.9.61 The Proposed Development at the Tilbury Site would result in a minor temporary reduction in the availability of terrestrial habitats as described in paragraph 7.9.39. However, following completion of construction the total extent of available habitat will be broadly similar. Based on the patterns of usage and scale of these losses they are unlikely to adversely affect intertidal wetland bird populations using the Tilbury Site.
- 7.9.62 The works that would generate the key sources of noise and visual disturbance are located a minimum of 390m to the north of the intertidal zone, associated with the proposed Tilbury SEC and associated construction laydown areas. As described in paragraphs 7.9.2 to 7.9.20 in relation to the assessment of potential impacts on the Thames Estuary and Marshes SPA and Ramsar, the areas of intertidal habitat are unlikely to be subject to any notable changes in noise levels as a result of the Proposed Development. Prior to mitigation noise levels at the foreshore would be very minor compared to the existing baseline, and close boarded noise fencing is proposed around the construction area as part of the embedded mitigation. Therefore, no negligible change in noise conditions is expected. Noise fencing and the current topography (including the sea wall) will act to minimise the risk of any increase in visual disturbance from the main construction works.
- 7.9.63 One of the options for the removal of spoil from the Tilbury Site by barge would require use of the Ingrebourne Valley jetty to the east of the Site. Approximately 80 barge movements would be required during the construction period of approximately 4 years. Given that the jetty is an existing feature and is in current regular use by barges this is considered a relatively small increase in noise and visual disturbance at this location.
- 7.9.64 Whilst the Tilbury Site directly adjoins the foreshore habitats, the only works that are proposed in close proximity are both short term (approximately 12 weeks) and small scale works to remove existing overhead lines. In accordance with the CEMP these works would be sensitively timed in order to limit the potential for disturbance of both breeding and wintering/passage birds utilising these habitats.
- 7.9.65 Overall, with the embedded mitigation measures in place the Proposed Development at the Tilbury Site disturbance impacts are only likely to result in temporary adverse effects (up to 4 years) on the conservation status of the intertidal wetland bird assemblage (or any constituent populations) at up to the Local level, which are not significant. The impacts will be reversible following completion of

construction works and the long-term effect on the wetland intertidal bird assemblage will therefore be Negligible and not significant.

Non-breeding Birds

- 7.9.66 The Tilbury Site was found to be of no more than Local importance for non-breeding birds. Both species numbers and total numbers of birds recorded was relatively low.
- 7.9.67 As described above in relation the intertidal wetland birds assemblage, the Proposed Development at Tilbury will result in small areas of permanent habitat loss, and areas of temporary habitat loss to facilitate works to overhead lines. The potential for adverse impacts due to noise and vibration resulting in displacement of non-breeding birds from habitat surrounding the proposed Tilbury SEC will be reduced by the close-boarded noise fencing that is part of the embedded mitigation. With these measures in place the Proposed Development is likely to result in a temporary adverse effect on non-breeding bird populations at the Site level which is not significant.

Breeding birds

- 7.9.68 Data from 2023 breeding bird surveys, alongside those undertaken in previous years by other projects, suggest that the breeding bird assemblage at the Tilbury Site is of Local importance.
- 7.9.69 As detailed in paragraph 7.9.39, there will be small scale initial habitat losses around the margins of the proposed Tilbury SEC, followed by later in the construction programme habitat management works associated with the overhead line removal and realignment works that may result in a temporary reduction in the availability of scrub habitat suitable for nesting. However, based on the scale of these losses and the relatively low numbers recorded during previous surveys, they are considered unlikely to adversely impact conservation status.
- 7.9.70 Sensitive seasonal timing of works and/or ecological supervision will act to limit the risk of direct loss of nests during vegetation clearance. However, without appropriate controls increased levels of noise, visual disturbance and lighting all have the potential to result in adverse impacts on nesting bird populations, through aborted breeding effort leading to reduced juvenile recruitment. As a consequence, the Proposed Development will include close-boarded fencing around the construction area to reduce noise and visual disturbance. In addition, the CEMP will ensure adherence to good practice measures to minimise light spill into adjacent habitats.
- 7.9.71 The Tilbury Site is located in an industrial setting and noise monitoring in support of the Report to inform Habitat Regulations Assessment Test of Likely Significant Effects identified frequent brief loud noise events. During construction these peak noise level events are likely to become more frequent, and in particular during the tunnelling phase at Tilbury there will be a peak in the frequency of these events, and they are also likely to occur 24 hours a day as the tunnel boring (and associated treatment plants and generators) will be continuous for approximately a 34-week period. Embedded mitigation measures will act to reduce the intensity and extent of any disturbance impacts that occur, such that adverse impacts are expected to be limited to those habitats immediately adjoining the Tilbury Site.
- 7.9.72 On this basis the net effect on the breeding bird assemblage at the Tilbury Site is expected to a temporary adverse (up to 4 years) effect on conservation status at the Site level only, which is not significant. The effect will be reversible (within 12 months of end of Construction) and in the long term will be negligible and not significant once construction is complete.
- 7.9.73 Baseline surveys recorded Cetti's warbler utilising habitat within the south of the Site that is required for overhead line works. Cetti's Warbler is afforded special protection under Schedule 1 of the Wildlife and Countryside Act (1981, as amended) (Ref 7-1), which makes it an offence to disturb the species when at or near the nest. The embedded mitigation measures will act to minimise the risk of an offence and will include seasonal timing to ensure thorough checks and establish suitable buffer zones during the overhead line works in the event they are found to be utilising habitat in the immediate vicinity of the required realignment works.

Widespread reptiles

- 7.9.74 The Tilbury Site is known to support all four species of widespread reptile. However, through the sensitive siting of the proposed Tilbury SEC it has been possible to minimise permanent losses of higher quality habitat.
- 7.9.75 Permanent and temporary habitat losses as a consequence of the Proposed Development are summarised in paragraph 7.9.39. Suitable areas of reptile habitat that will be removed during initial site clearance will be limited to the following:
- an approximately 0.1ha section of roadside verge on the western margin of the proposed Tilbury SEC;
 - an approximately 0.2ha section of roadside section of tall fescue dominated habitat surrounding the larger hardstanding area to enable access between the proposed Tilbury SEC and the adjoining compound;
 - an approximately 300m² strip of roadside verge to the north-east of the proposed Tilbury SEC
 - a 100m² section of tall fescue dominated habitat adjoining the large hardstanding slab to the west of the proposed Tilbury SEC to enable a new access road; and
 - minor removal of scrub and grassland (max 3m width) around the existing hardstanding slab to enable a fence to be erected.
- 7.9.76 Subsequently in 2028 further habitat management would be required within the fields to the north and south of the SEC to enable pylon removal/erection and the removal/realignment of overhead lines. Approximately 0.4ha would be cleared entirely to allow construction of a crane pad (works duration approximately 16 weeks). A further total area of 2.3ha would be subject to selective habitat manipulation to enable overhead cable works (see ES Volume II – Chapter 3: Project Description). Clearance would involve cutting back vegetation as required to ground level as required to allow cabling to be safely rolled up/out by hand without becoming tangled. It is likely only a small percentage of the total 2.4ha would be cleared.
- 7.9.77 These all represent very small extents in the context of the available areas of suitable reptile habitat within and adjoining the Site, and following landscaping and reinstatement the overall change in suitable reptile habitat will be negligible.
- 7.9.78 The habitat manipulation works will reduce scrub cover and introduce new areas of shorter vegetation and bare ground within these extents and as such in the short-term following construction are likely to be neutral or potentially positive with respect to reptile habitat quality by introducing a more varied age structure to the habitat mosaic. As these areas are not controlled by National Grid, their ongoing maintenance to maintain these conditions will not be responsibility of National Grid and therefore a longer-term benefit is not assumed.
- 7.9.79 The areas requiring initial clearance are likely to support relatively small numbers of widespread reptile species only, and
- 7.9.80 given that the larger areas where overhead line works is required will commence later in the construction programme no trapping programme is proposed. Instead, through the implementation of a precautionary method of works, any reptiles present in these areas will be encouraged to move into adjacent areas of retained habitat through phased vegetation clearance progressing in the direction of retained habitat, undertaken during the period reptiles are active, following by hand search and destructive clearance. These measures will seek to avoid killing/injury of reptiles and ensure legislative compliance. For overhead line works there is the opportunity to conduct these works spaced over a period of several years if needed to limit any impacts on the existing population.
- 7.9.81 The habitat loss/modification that will occur as a consequence of the Proposed Development at Tilbury is on a precautionary basis expected to result in a temporary adverse effect at the Site level that is not significant due to disturbance and temporary reduction in habitat availability. In the short term (1-2 years) following construction the effect is likely to become beneficial at the Site level (not

significant) due to an increase in the structural complexity of the habitat, and in particular and increase in suitable basking habitat.

Invertebrates

- 7.9.82 Baseline surveys undertaken in 2023 confirmed that the invertebrate assemblage supported by the Tilbury Site and wider surrounding area are of National importance.
- 7.9.83 The construction of the Proposed Development at Tilbury will result in the habitat losses identified in paragraph 7.9.75. The areas of tall fescue dominated verge that will be removed are relatively small in extent totalling approximately 0.35ha. These areas of tussocky grassland habitat provide suitable habitat for a range of the key invertebrate species identified at the Tilbury Site but are of most value to the populations of tall fescue planthopper, which were found to be present in these areas and are a Species of Principal Importance and also listed as a Red Data Book 'Insufficiently known' status (RDBK), as there are limited records upon which to make an assessment of its population status.
- 7.9.84 The losses of tall fescue habitat (the food source for tall fescue planthopper) represent approximately 36% of the total areas of tall fescue dominated verge available in the immediately surrounding area. In addition, other areas of suitable habitat are known to be present within the wider surrounding area including within the PFA plateau to the east of the Tilbury Site. The habitat losses will result in a reduction in the availability of suitable habitat, and at the interface between the SEC and construction compound introduce a gap of approximately 100m in the existing strips of suitable habitat. While tall fescue is a mobile species, this may lead to some direct losses from the population during vegetation clearance works and have a minor impact on the ability of the tall fescue planthopper to disperse through these areas during the 4-year construction period when these areas of habitat will be unavailable.
- 7.9.85 In addition to the areas of tall fescue habitat loss there will be temporary losses of an area of 0.4ha of grassland/reed/scrub mosaic habitat within the field to the north of the proposed SEC. This loss will occur in 2028 and the area will be reinstated after approximately 12 weeks and the area allowed to recolonise naturally.
- 7.9.86 The overhead line alignments will be subject to some habitat clearance works to facilitate the stringing works. These areas total 2.3ha, however habitat clearance will only be undertaken where necessary so is unlikely to require clearance of the full extent. Works required in these areas will involve the temporary disturbance of these areas only and the requirement for scrub clearance in some areas is likely to diversify the structure of the overall habitat mosaic, in areas that are starting to develop closed swards and succeed to scrub. As such these areas of habitat management are likely to be beneficial for the wider invertebrate assemblage through creating further variation in the age structure of the sward and introducing some new areas of bare ground through the disturbance during the works. Following the short term works in these areas the areas will be reinstated, avoiding flat and compacted ground and encouraging some scrapes, and vehicle tracks to enhance variability of conditions.
- 7.9.87 In addition, as detailed in paragraph 7.7.8 the habitat creation around the new SEC and the biodiverse brown roof will provide further features of value to the invertebrate assemblages at Tilbury.
- 7.9.88 Overall, while the wider Tilbury area supports a nationally significant invertebrate assemblage the Proposed Development at Tilbury will result in limited temporary habitat losses during construction, but in the longer term the proposed reinstatement, landscaping (which will deliver a net increase of 540m² of tall fescue dominated habitat), brown roof provision and modifications of retained habitats required as part of the Proposed Development will in the long term provide habitat suitable for maintaining the brownfield invertebrate species of interest.
- 7.9.89 For the majority of the invertebrate assemblage the embedded mitigation measures are likely to ensure that there is no significant effect on the conservation status of the species populations concerned. However, in the absence of this further mitigation there is the potential that temporary habitat loss during construction, associated habitat severance and lag in re-establishment of habitats

may result in a temporary adverse effect on tall fescue planthopper (approx. 6-8 years) that would be significant at up to the District level may occur

Water vole

- 7.9.90 The majority of ditches within and adjacent to the Tilbury Site will be retained with an adjoining 5m buffer zone of retained habitat. In addition, the controls within the Outline CEMP will act to minimise the risk of pollution of the watercourses supporting water vole.
- 7.9.91 The design of the Proposed Development will ensure there is no change in the existing drainage and outfalls into ditches/drains during the construction period. No water generated by the tunnelling process will be discharged to the existing ditches.
- 7.9.92 There is a requirement to install one new headwall to allow surface water run off to discharge to the existing drain to the east of the proposed Tilbury SEC (WB3). The ditch is known to support water vole, however the section adjacent to the proposed SEC is currently overgrown and no recent burrows were recorded in the section adjacent to the proposed SEC during the 2023 surveys.
- 7.9.93 In addition, a 10m section of ditch WB6 to the north of the large hardstanding slab to be used as a construction compound will be temporarily culverted during construction to enable a new access road to span the ditch. The culvert will be removed, and the ditch reinstated following construction.
- 7.9.94 In each case a suitable section of ditch not supporting burrows will be identified by a water vole holder of a CL31 licence to displace water vole. Where necessary habitat manipulation will be undertaken in advance of the works to displace water vole from a 5m section of bank to allow a new headwall to be installed.
- 7.9.95 Noise and lighting controls within the Outline CEMP will act to reduce the potential for adverse impacts on the retained ditches. However, based on the proximity of the ditches to the construction area, it is possible that these impacts will result in some disturbance and temporary displacement of water voles utilising the immediately adjoining section of ditch during the construction period (approx. 4 years). Lighting and noise will reduce following completion construction and therefore this is expected to result in a temporary adverse effect (approx. 4 years) at the Site level only which is Not Significant.

Protected and/or notable plant species

- 7.9.96 Notable plant records for the Tilbury Site are associated with ditches (to be retained with a 5m surrounding buffer) and the areas of disturbed ground adjoining the ditch in the southwest corner of the site (adjoining the existing SEC). These habitats are retained in the Proposed Development and only fall within the area where cutting back of habitats will be undertaken to provide access for lowering the cables to ground level in 2028. Cutting back in these areas will not be needed in all of these areas and as such it is likely to be possible to retain any notable plant populations in situ.
- 7.9.97 The ECOW will undertake a search of all areas to be disturbed during works for notable rare/plant species and where found their locations will be clearly demarked to enable them to be avoided during works.
- 7.9.98 Embedded mitigation measures will therefore act to ensure that any impacts on protected and/or notable plants are negligible and no significant effects are expected.

Invasive Non-Native Species

- 7.9.99 Prior to the commencement of site clearance works a check will be made for any new invasive non-native species to ensure legislative compliance.
- 7.9.100 The invasive non-native species Russian olive is present throughout the Tilbury Site. While it is not currently listed under Schedule 9 of the Wildlife and Countryside Act (1981 as amended), in order to prevent its further spread an INNS management plan will be implemented during site clearance works.

Operational Phase

Designated Sites

Thames Estuary & Marshes SPA and Ramsar and Mucking Flats and Marshes SSSI

- 7.9.101 Thames Estuary and Marshes SSSI, SPA and Ramsar is located approximately 1.3km to the southeast of the Tilbury Site at its closest point. During the operational phase the Tilbury SEC will be unmanned and in normal operation it is expected that there will be approximately bi-monthly visits with a light van or car. Maintenance works are expected to require a further five to ten light goods vehicle visits every two to five years. These levels of activity are comparable to those for the existing SEC which is located closer to the foreshore than the new Tilbury SEC. The site and adjoining habitats are only utilised by low numbers of the species for which the SPA and Ramsar site are designated.
- 7.9.102 All surface water runoff from the headhouse roof and any water pumped from the tunnel will be discharged into free draining stone material within the SEC, and soak away naturally. Surface water from the road will drain via filtration trenches and be discharged into the existing ditch to the east of the proposed SEC. The proposed discharge will be restricted to greenfield run-off rates (0.4litre per second) and will be similar to existing levels. As such no adverse impacts (or resultant significant effects) on nearby designated sites are expected.

Tilbury Power Station LWS

- 7.9.103 As detailed above, during the operational phase activity associated with the tunnel and SEC will be minimal, and no significant change in the levels of surface water run-off are expected.

External lighting will be provided within the SEC and will be designed in accordance with the Institute of Lighting Professionals Guidance Note 8 Bats and Artificial Lighting (Ref 7-45 Air Pollution Information System. Available at <https://www.apis.ac.uk/>

- 7.9.104 Ref 7-46). Lighting will be activated by sensors when required and based on the low anticipated frequency of maintenance any lighting of the SEC is expected to be minimal. On this basis there is considered to be negligible risk of disturbance of faunal species utilising the LWS.
- 7.9.105 As a consequence, with embedded mitigation measures in place no significant effects on the Tilbury Power Station LWS are expected.

Other Designated Sites

- 7.9.106 No adverse impacts (or resultant effects) on any of the other designated sites within the study area are expected, based on their distance from the Tilbury Site and the lack of any functional linkages.

Habitats

- 7.9.107 During the operational phase it is possible that occasional access to the pylons and overhead lines will be required for maintenance works. When such events occur, they may result in temporary disturbance of habitats below the overheads and around the pylon bases. Given the brownfield mosaic nature of the habitat no significant adverse effect on the conservation status of the habitats concerned is expected.

Protected and/or notable species

- 7.9.108 As detailed in relation to the Tilbury Power Station LWS embedded mitigation will minimise the potential for light spill, and limit discharge to existing ditches to levels similar to those experienced currently. In addition, no significant noise generating activities are expected during operation. Based on this and the low levels of human activity (and thus visual disturbance) the operation of the new Cable Tunnel and proposed Tilbury SEC is unlikely to result in any ongoing disturbance of

surrounding habitats (that may support reptiles, foraging bats, birds and widespread reptiles) during the operational phase.

- 7.9.109 The Proposed Development results in minor changes in the alignment of the overhead lines to the north of the proposed Tilbury SEC, and in addition removes the section of overhead lines linking to the existing Tilbury SEC. There are no indications that the existing overhead lines adversely affect flight lines of bird species currently utilising this area of the wider Thames Estuary, with usage mainly limited to smaller birds rather than larger species that are more susceptible to overhead line collisions. The changes that will occur are minor in nature and as a consequence of the Proposed Development are therefore not expected to impact existing bird populations that utilise the Site and immediate surrounds.
- 7.9.110 During the operational phase it is possible that occasional access to the pylons and overhead lines will be required for maintenance works. When such events occur they may result in temporary disturbance of habitats below the overheads and around the pylon bases. A precautionary working method (incorporating sensitive timing of works) will be implemented under the supervision of an ECOW for any works requiring habitat clearance of disturbance. These measures will be sufficient to limit impacts and avoid killing/injury of protected and/or notable species during maintenance works.
- 7.9.111 No significant effects of protected and/or notable species are expected during the Operational Phase.

7.10 Additional Mitigation

Tilbury Power Station LWS/Open Mosaic Habitat on Previously Developed Ground

- 7.10.1 In the event that it is necessary to utilise diesel generators to power the TBM's, then additional mitigation will be provided in order to reduce the levels of nitrogen deposition on nearby habitats during the 9-month tunnelling period.
- 7.10.2 Generators utilised will incorporate Selective Catalytic Reduction (SCR) technology to reduce emissions at source, and in addition an elevated stack will be provided to aid dispersal. The stack height utilised will be sufficient to ensure that nitrogen deposition contributions of the Proposed Development are reduced to a level where they are less than 1% of the Critical Load for the habitats within the Tilbury Power Station LWS and the areas of open mosaic habitat which it contains.
- 7.10.3 These measures will reduce nitrogen deposition to a level where no significant effects are likely to occur.

Invertebrates

- 7.10.4 Additional measures will be employed to mitigate and compensate for potential impacts on terrestrial invertebrate populations, in particular the tall fescue planthopper.
- 7.10.5 The tall fescue planthopper is closely associated with its key food plant, tall fescue. In order to reduce the level of direct mortality, maintain the availability of suitable habitat throughout the construction phase, and speed re-establishment well established tussocks of tall fescue from the areas of tall fescue habitat impacted will be translocated.
- 7.10.6 Well established tall fescue tussocks (rather than the full sward) will be translocated from the affected areas between mid-July and end of August, during which time adult females will be laying eggs (Dittrich, 2016), and so translocating tussocks during this period also gives the best chance of transporting eggs as well. Tussocks will initially be translocated, along with where possible approximately 200mm of the underlying soil (likely in part PFA) to an interim holding location within the hardstanding laydown area to the west of the proposed Tilbury SEC. This location has been selected due to proximity to other areas of retained tall fescue habitat, enabling eggs and adults to move into these adjoining areas and provide an ongoing source to repopulate the area in subsequent years.

- 7.10.7 Tussocks will be lifted using an excavator under the supervision of an ecologist and transported along with approximately 200mm of the underlying substrate to a temporary holding area (of similar area to that impacted). Soils will be placed on geotextile membrane and tussocks placed on top firming with the excavator bucket to minimise air gaps. Tussocks will be monitored by an ecologist throughout construction and watered as required until construction has progressed sufficiently to allow them to be moved to their final positions within the grassland verges that will surround the operational SEC (expected approximately (approximately 36months) or existing areas that will be reinstated. Tall fescue is a species that is tolerant of drought and as such is expected likely a good proportion will tolerate temporary storage under these conditions.
- 7.10.8 Once construction is complete these tussocks and associated soil will be utilised to aid reestablishment of the areas of tall fescue habitat temporarily impacted (e.g., cable diversion to the north east of the proposed Tilbury SEC, and the area of verge cleared to enable access to the construction compound). In addition material will be used within the 0.16ha of grassland to be created surrounding the proposed Tilbury SEC (see Figure 7-4) which will be aimed at providing a habitat mosaic suitable for a range of invertebrate species. The translocated tussocks will be supplemented by seed collected from the surrounding areas of retained grassland to the south of the SEC to ensure colonisation by a range of species characteristic of the surrounding rough grassland and mosaic habitats. Following feedback from Natural England scrub has been removed from the Outline Landscape and Ecology Plan (Appendix A of the Outline LEMP).
- 7.10.9 Prior to commencement of site clearance, a detailed mitigation strategy for the tall fescue planthopper will be devised and agreed with the local planning authority. This is expected to include details of:
- Works methodology to be utilised for translocation of existing tall fescue habitat;
 - Location of temporary receptor site;
 - Specification for the reinstatement of areas of temporary disturbance associate new pylon construction in field to the north of the proposed Tilbury SEC;
 - Measures to be incorporated into final landscape design to benefit tall fescue planthopper and other invertebrates; and
 - Monitoring surveys to check status of impacted populations, mid-construction and during years 1, 3 and 5 post construction.
- 7.10.10 The draft PMoW will be shared with key consultees such as the planning authorities, Port of Tilbury, Buglife and Natural England for their comment prior to being implemented.
- 7.10.11 Following the implementation of the additional mitigation measures the effect on tall; fescue planthopper is expected to reduce to a temporary adverse effect (4-6 years) at the Site level that is Not Significant.

Off Site Habitat Creation

- 7.10.12 Excavation of the tunnel will generate a large volume of spoil material. There are several examples in the wider Thames Estuary of such material being utilised for large scale habitat creation. National Grid are in negotiations with a number of suitable partner organisations with the facilities to accept spoil materials through existing consented operations (e.g., RSPB at Cliffe Pools) to enable habitat enhancement of existing wetland sites.
- 7.10.13 Assuming that an agreement is reached this will represent additional biodiversity enhancement to be delivered as consequence of the Proposed Development.
- 7.10.14 As detailed within the Biodiversity Net Gain Assessment and Strategy Report, National Grid are committed to ensuring that the Proposed Development as a whole will achieve 10-15% Biodiversity Net Gain. While good progress has been made towards this goal, further measures are required to ensure this target is achieved. In line with the strategy set out in the report, opportunities will continue to be developed to ensure this target is achieved.

7.11 Residual Effects

- 7.11.1 Table 7-12: Assessment of Residual Biodiversity Effects provides a summary of all effects on Important Ecological Features (IEF's) before and after additional mitigation.
- 7.11.2 Following the implementation of the embedded and additional mitigation measures no significant effects on IEF's are expected as a results of the construction and operation of the Proposed Development at the Tilbury Site.

Table 7-12: Assessment of Residual Biodiversity Effects

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Construction Phase						
Thames Estuary & Marshes Special Protection Area (SPA) and Ramsar	International	- Noise and visual disturbance of potential 'supporting habitat'; - Vibration from tunnelling; - Water pollution; - Increased NO_x levels from use of diesel generators - Increase in barge movements.	- Tilbury SEC sited away from sensitive foreshore habitats; - Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance); - Noise fencing of construction area.	No significant effect on structure/function (Negligible – Not Significant)	None required	No significant effect on structure/ function (Negligible – Not Significant)
Mucking Flats & Marshes Site of Special Scientific Interest (SSSI)	National					
Medway Estuary and Marshes SPA	International					
Swanscombe Peninsular SSSI	National	Noise and visual disturbance	Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance).	No significant effect on structure/function (Negligible – Not Significant)	None required	No significant effect on structure/ function (Negligible – Not Significant)
Swanscombe MCZ	National	Disturbance and mobilisation of sediments due to	- Use of existing berth in Port of Tilbury - No barge movements to the west of Port of Tilbury	No significant effect on structure/function (Negligible – Not Significant)	None required	No significant effect on structure/ function (Negligible – Not Significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
		increased barge movements • Vibration due to tunnelling activity				
Tilbury Power Station LWS	Up to National	• Temporary habitat loss/modification due to overhead cables works • Noise and visual disturbance • Vibration due to tunnelling activity • Increased NO _x levels from use of diesel generators	• Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance); • Noise fencing of construction area.	Temporary adverse effect on structure and function at up to Local level, not significant (Minor adverse – Not Significant)	Generator stack height of 23-25m and emissions filtering to reduce contribution to less than 1% of the Critical Load	No significant effect on structure/ function (Negligible – Not Significant)
Other non-statutory designated sites	County	• Noise and visual disturbance • Increased NO _x levels from vehicle movements	• Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance).	No significant effect on structure/function (Negligible – Not Significant)	None required	No significant effect on structure/ function (Negligible – Not Significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Habitat within the Site - Grassland/ scrub/reed mosaic	District	• Permanent and temporary habitat loss • Noise, visual and light pollution • Increased NO_x levels from use of diesel generators	• Tilbury SEC located largely in hardstanding • Clearance to facilitate overhead lines will minimise footprint of works and only remove vegetation where necessary. • Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance) • Creation of 0.16ha tussocky grassland surrounding the Tilbury SEC (gain of 560m²) • Creation of 680m² biodiverse brown roof • Natural regeneration of temporarily impact habitats	Temporary adverse effect at the Site level (approx. 4 years), Not Significant (Minor adverse, Not Significant)	None	Temporary beneficial effect at Site level (1-2 years after construction) - Not Significant (Minor beneficial Not-Significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Habitat within the Site - Ditches/drains	Local	10m section of seasonally wet ditch to be temporarily culverted during construction. 5-10m section of ditch bank east of proposed SEC to be disturbed for headwall - Noise, visual and light pollution	- Pollution controls in outline CEMP - No discharge to ditches during construction - Removal of culvert after construction	Temporary adverse effect (approx. 4 years) on conservation status at Site level, Not Significant (Minor adverse – Not Significant)	None required	No significant effect on conservation status (Negligible – Not Significant)
Habitat adjoining the Site - PFA plateau	Up to National	- Noise and visual disturbance - Vibration due to tunnelling activity - Increased NO_x levels from use of diesel generators	Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance)	Temporary adverse effect (approx. 4 years) on conservation status at up to the Local level, Not Significant (Minor adverse – Not Significant)	Generator stack height of 23-25m and emissions filtering to reduce contribution to less than 1% of the Critical Load	No significant effect on conservation status (Negligible – Not Significant)
Bats Assemblage at Tilbury	Local	- Reduction in foraging habitat - Disruption of flight lines - Light pollution	- Siting has minimised habitat loss - Habitat creation and landscaping at SEC - Outline CEMP measures (including pollution controls; noise and dust suppression sensitive timing of vegetation clearance)	Temporary adverse effect at the Site level, Not Significant (Minor adverse – Not Significant)	None required	No significant effect on conservation status (Negligible – Not Significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Intertidal bird assemblage at Tilbury	County	- Temporary and permanent habitat loss reducing availability of foraging and roosting habitat - Noise, visual and light disturbance	- Outline CEMP measures (including noise suppression and sensitive timing of vegetation clearance) - Noise fencing of construction area	Temporary adverse effect (approx. 4 years) at the Local level, Not Significant (Minor adverse – Not significant)	None required	Negligible effect on conservation status, not significant (Negligible – Not Significant)
Non-breeding bird assemblage at Tilbury	Local	- Temporary and permanent habitat loss - Noise, visual and light disturbance	- Tilbury SEC is sited away from the foreshore - Outline CEMP measures (including noise suppression and sensitive timing/PMoW for vegetation clearance) - Noise fencing of construction area	Temporary adverse effect (approx. 4 years) at the Site level, Not Significant (Minor adverse – Not significant)	None required	No significant effect on conservation status, not significant (Negligible – Not Significant)
Breeding birds assemblage at Tilbury	Local	- Temporary and permanent habitat loss - Destruction of nests/failed breeding effort - Noise, visual and light disturbance	- Outline CEMP measures (including noise suppression and sensitive timing/PMoW for vegetation clearance) - Noise fencing of construction area	Temporary adverse effect (approx. 4 years) at the Site level, Not Significant (Minor adverse – Not significant)	None required	No significant effect on conservation status (Negligible – Not Significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Reptile Assemblage utilising Tilbury Site and adjacent habitats	County	- Temporary and permanent habitat loss - Direct killing/injury during site clearance - Noise, visual and light pollution of retained habitats	- Tilbury SEC sited to minimise habitat loss in areas of higher quality reptile habitat. - Outline CEMP measures and PMoW for phased vegetation clearance prior to works	Temporary adverse effect (approx. 4 years) at the Site level, Not Significant (Minor adverse – Not significant)	None required	Temporary beneficial effect at Site level (1-2 years following construction), Not Significant (Negligible – Not Significant)
Invertebrate assemblage utilising Tilbury Site and adjacent habitats	National	- Temporary and permanent habitat loss - Direct loss of individuals/life-stages during site clearance - Noise, visual and light pollution of retained habitats - Change in habitat composition	- Tilbury SEC sited to minimise habitat loss in areas of higher quality invertebrate habitat - Embedded habitat creation around SEC and provision of brown roof - Reinstatement of areas impacted by overhead works to promote invertebrate diversity	Temporary significant permanent adverse effect at District level on conservation status of tall fescue planthopper (approx. 6-8 years) (Moderate adverse – Significant)	Translocation of tall fescue tussocks and use within Tilbury SEC landscaping and reinstatement.	Temporary adverse effect (approx. 4-6 years) at the Site level of conservation status of tall fescue planthopper (Minor adverse – Not Significant)
Water vole populations utilising WB1, WB3 and WB6	District	- Temporary and permanent habitat loss - New/alterd outfalls (water quantity and quality) - Noise, visual and light pollution of retained habitats	- Outline CEMP measures (including pollution controls; noise and dust suppression and control of lighting) - Displacement of water voles under Natural England class licence (as required) to enable headwall construction	Temporary adverse effect (approx. 4 years) at the Site level only which is Not Significant (Minor adverse – Not Significant)	None required	No significant effect on conservation status (Negligible – Not Significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Protected and/or notable plant species at Tilbury Site	District	Potential loss/disturbance during ground works to prepare for overhead line works	ECOW to check for protected/notable species prior to clearance works and fence off any areas where they occur for retention	No significant effect on conservation status (Negligible – Not Significant)	None required	No significant effect on conservation status (Negligible – Not Significant)
Invasive Non-Native species (INNS)	-	Potential for spread of INNS	- ECOW to check site prior to site clearance for any new INNS - Invasive species management plan to be drafted and implemented for Russian olive	-	-	-
Operational Phase						
Thames Estuary & Marshes SPA and Ramsar	International	- Noise and visual disturbance during construction - Water pollution	- Any water from the tunnel during operation discharged to ground in free draining stone surrounding Tilbury SEC - Design of surface water drainage restricted to greenfield run-off rates	No significant effect on structure/function (Negligible – Not significant)	None required	No significant effect on structure/function (Negligible – Not significant)
Mucking Flats and Marshes SSSI	National					
Tilbury Power Station LWS	Up to National	- Noise and visual disturbance - Operational lighting resulting in disturbance of fauna - Water pollution	- Lighting to be minimised and provided in accordance with best practice guidance - Facility unmanned with occasional maintenance only	No significant effect on structure/function (Negligible – Not significant)	None required	No significant effect on structure/function (Negligible – Not significant)

Receptor	Importance	Potential Impact	Avoidance/ embedded Mitigation	Significance of Effect Prior to Additional Mitigation (equivalent assessment criteria conclusion)	Additional Mitigation	Residual Effect
Other designated sites	Up to County	- Noise and visual disturbance - Operational lighting resulting in disturbance of fauna - Water pollution	- Lighting to be minimised and provided in accordance with best practice guidance - Facility unmanned with occasional maintenance only	No significant effect on structure/function (Negligible – Not significant)	None required	No significant effect on structure/function (Negligible – Not significant)
Habitats	District	Temporary disturbance of habitats during maintenance works	PMoW to be implemented to avoid impacts during any site clearance/disturbance required during maintenance access to overhead lines	No significant effect on conservation status (Negligible – Not significant)	None	No significant effect on conservation status (Negligible – Not significant)
Protected and/or notable species	Up to National	- Noise and visual disturbance - Operational lighting resulting in disturbance of fauna - Maintenance works leading to occasional temporary habitat modification - Bird strike of overhead lines due to change in alignment	- Lighting to be minimised and provided in accordance with best practice guidance - Facility unmanned with occasional maintenance only - PMoW to be implemented to avoid impacts during any site clearance/disturbance required during maintenance access to overhead lines	No significant effect on conservation status (Negligible – Not significant)	None	No significant effect on conservation status (Negligible – Not significant)

7.13 Summary

- 7.13.1 An assessment has been undertaken of the likely effects of the Proposed Development on Important Ecological Features (IEF's) at the Tilbury Site. It has considered the likely effects on ecological receptors during the construction and operational phases.
- 7.13.2 The Proposed Development is located within the Tilbury Power Station Local Wildlife Site (LWS), a non-statutory designated site. The LWS is part of a larger area that Natural England are considering proposing for designation as a SSSI on the basis of its value for invertebrates, reptiles, birds and protected/notable plants. It is therefore assumed to be of up to National importance.
- 7.13.3 The Tilbury Site is approximately 1.3km from the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar site, and Mucking Flats and Marshes SSSI. The sites are of up to International importance on the basis of internationally important wintering and passage bird population, and the intertidal habitat adjoining the Tilbury Site is suitable for use by the same bird species.
- 7.13.4 The Tilbury Site consists of areas of hardstanding that will be used for the proposed Tilbury SEC and associated construction laydown areas. In addition, there are areas of grassland/scrub mosaic habitat to the north and south of the proposed Tilbury SEC which are required for works to realign existing overhead lines.
- 7.13.5 Invertebrate surveys identified that the Tilbury Site is of national importance for the invertebrate assemblage that its habitats support. A total of 5 Species of Principal Importance were recorded as follows: tall fescue planthopper (*Ribautodelphax imitans*); brown-banded carder-bee (*Bombus humilis*); shrill carder-bee (*Bombus sylvarum*); wall butterfly (*Lasiommata megera*) and small heath butterfly (*Lasiommata megera*). The records of most note are of tall fescue-planthopper a species closely associated with its food plant tall fescue (a tussocky grass) and with very limited UK records.
- 7.13.6 Surveys have also identified that the Tilbury Site support notable populations of reptile (adder, slow worm, grass snake and common lizard all present), and ditches support water vole. A badger sett is located approximately 20m from the Tilbury Site. The Site is only of local importance for breeding and wintering birds, but records included Cetti's warbler which is afforded special protection under Schedule 1 of the Wildlife and Countryside Act (1981, as amended).
- 7.13.7 The Proposed Development at Tilbury will incorporate a range of embedded mitigation measures that have been included in the design to avoid and/or reduce impacts on important ecological features. This includes minimising vegetation clearance, reinstatement of temporary habitat loss during construction, and new habitat creation around the proposed Tilbury SEC. In addition, a range of CEMP measures will be employed to reduce/avoid impacts including sensitive timing of works and maintaining buffer zones around all ditches. Close-boarded noise fencing will be erected around the construction site to limit noise disturbance.
- 7.13.8 Intertidal habitats adjoining the Tilbury Site found six species had peak counts exceeding 1% of the SPA/Ramsar populations: gadwall; little egret; avocet; black tailed godwit; dunlin; and redshank. In addition, the same areas support a range of red and amber Birds of Conservation Concern (BoCC) species. However, in the context of the wider Thames Estuary, the Tilbury Site Survey Area is only occasionally used by these species and does not appear as important for waterbirds as intertidal habitats towards the mouth of the River Thames.
- 7.13.9 Noise and disturbance from the Proposed Development are not expected to adversely affect the structure and function of the SSSI, SPA and Ramsar as the main construction works are set back from the foreshore and following embedded mitigation measures no notable changes in noise levels are expected. A temporary adverse effect (approx. 4 years) at the Local level which is not significant is expected on the wider intertidal habitat adjoining the Site. For both breeding and non-breeding birds there will similarly be a temporary adverse effect (approx. 4 years) at the Site level that is not significant.
- 7.13.10 The Proposed Development at the Tilbury Site will involve works within the Tilbury Power Station LWS, however the design has sought to avoid habitat losses within the LWS, through siting the proposed Tilbury SEC in an area of existing hardstanding. These works within the LWS are limited

to works to realign and remove overhead lines and will involve cutting back some of the existing vegetation to ground level. Clearance will be minimised but there will be temporary adverse effects at the Site level that are not significant due to disturbance. The areas of existing habitat that are cleared are in need of intervention to limit the encroachment of scrub and therefore following completion of construction there will be a 1-2 year period where the effect become a temporary beneficial effect at the Site level that is not significant.

- 7.13.11 The Proposed Development will require the removal of approximately 36% of the tall fescue dominated habitat at the Tilbury Site. This is the main food species of tall fescue planthopper, and prior to additional mitigation there would be a significant adverse effect. In order to mitigate and compensate for these habitat losses tall fescue tussocks will be translocated during construction to a temporary holding area. On completion of construction, they will be used to reinstate areas of temporary habitat loss and used to create new habitat in the areas around the new Tilbury SEC (0.16ha). the translocated tussocks will be supplemented by sowing of local seed to create other areas of tussocky grassland of value for invertebrates. In addition, reinstatement of working areas will be encouraged to introduce structural diversity by ensuring ground is left uncompacted and incorporate scrapes, tyre tracks etc. This will result in a net increase of approximately 540m² in suitable habitat for tall fescue planthopper. A biodiverse brown roof will also be provided. Following these measures, no permanent significant effects on conservation status of invertebrates are expected.
- 7.13.12 During operation of the Tilbury SEC, it will be unmanned during normal operation and minimal disturbance of adjacent habitats and associated species are expected. No significant effects are expected on designated sites, habitats or species during the operational phase.

7.14 References

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7.15 Abbreviations

Abbreviation	Meaning
APIS	Air Pollution Information System
BNG	Biodiversity Net Gain
BoCC	Birds of Conservation Concern
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CRoW	Countryside and Rights of Way
EcIA	Ecological Impact Assessment
ECow	Ecological Clerk of Works
ES	Environmental Statement
GCN	Great Crested Newt
HRA	Habitat Regulations Assessment
IEF	Important Ecological Features
LEMP	Outline Landscape and Ecology Management Plan
LWS	Local Wildlife Site
MCZ	Marine Conservation Zone
NERC	Natural Environment and Rural Communities
NERC	Natural Environment and Rural Communities
NPS	National Policy Statement
NVC	National Vegetation Classification
PEA	Preliminary Ecological Appraisal
PFA	Pulverised Fuel Ash
PMoW	Precautionary Method of Working
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SCR	Selective Catalytic Reduction
SEC	Sealing End Compound
SPA	Special Protection Area
SSSI	Special Protection Area
TBM	Tunnel Boring Machine
TKRE	Tilbury to Grain and Tilbury to Kingsnorth
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive

