RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Environmental Statement

Volume 7

Chapter 18 – Terrestrial Ecology and Ornithology

(Revision 5) (Clean)

Submission for Deadline 2

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Company:	**RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited**	Asset:	**Development**
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Rev No.	Date	Status/Reason for Issue	Author	Checked by	Approved by
01	June 2024	Final for DCO Application	Ecus / RHDHV	RWE	RWE
02	November 2024	Submission at previous Draft Deadline 2	RHDHV	RWE	RWE
03	December 2024	Submission in response to Natural England's Relevant Representation	RHDHV	RWE	RWE
04	January 2025	Submission in Response to ExA Rule 4, 6, 9, 13 and 17 Letter [PD-010]	RHDHV	RWE	RWE

05	February 2025	Submission for Deadline 2	RHDHV	RWE	RWE

Revision Change Log			
Rev No.	**Page**	**Section**	**Description**
01	N/A	N/A	Submitted for DCO Application
02	37	Section 18.3.4 Table 18-4	The mitigation for trees has been updated to confirm an Arboricultural Impact Assessment (AIA) has been undertaken. This has been updated in response to the submission of the AIA to the ExA on the 8th November (Revision 2) [AS-036] and [AS-037].
02	53/158	18.4.1.3/ References	The most recent East Riding of Yorkshire Local Plan has been added to this section in response to the Environment Agency Relevant Representation (RR-015:13) [PDA-013]. The references to both plans have been updated.
02	116	18.6.1.8.4	The mitigation wording has been updated to confirm that if vegetation removal is required during the bird nesting season, an ornithologist/ecologist should be on site and oversee each section that is cut down. This has been added in response to the Environment Agency Relevant Representation (RR-015:14) [PDA-013]. Which stated, '*Leaving it for 48 hours after the initial check, risks birds coming in and starting nesting.*'
02	152	18.12	The mitigation wording has been updated to confirm that as well as covering excavations at night, they should also be fitted with a ramp to allow pets and wild animals to escape if they should fall into them. This has been added in response to the Environment Agency Relevant Representation (RR-015:15) [PDA-013].
03	N/A	N/A	The chapter has been updated in response to Natural England Relevant Representation on RR-039: B25 Construction [AS – 048].
03	36	Table 18-4	Updated to add mitigation for the maritime cliff and slope habitat at the emergency beach access.
03	101, 102, 108	18.6.1.3.3 - Maritime cliff and slope and 18.6.1.3.1.4 - Significance of effect - All Scenarios	Construction Impact 3 has been updated to add an assessment of the potential temporary impact to maritime cliff and slope habitat from use of an emergency beach access and to confirm mitigation would be the installation of suitable protective matting prior to construction to align with the wording in **Appendix 18- 10 Biodiversity Net Gain Strategy** [APP-157].

Revision Change Log			
Rev No.	**Page**	**Section**	**Description**
03	156	Table 18-20 - Summary of Potential Likely Significant Effects on Terrestrial Ecology	Updated for impact 3 to confirm habitat mitigation would include protection in addition to reinstatement.
04	80 113	18.5.4.3.1 18.6.1.6	The chapter has been updated in response to the Rule 4, 6, 9, 13 and 17 letter [PD-010] which requested the Applicants to provide further clarification on the number of trees which have bat roost potential and may be impacted by the Projects.
05	39	Table 18-4	**Chapter 18 Terrestrial Ecology and Ornithology (Revision 5)** [document reference 7.18] has been updated to add clarification on the width of hedgerow removal where the haul road adjoins the public highway.
05	41	Table 18-4	Two additional embedded mitigation measures have been added to Table 18-4, which include Water Voles and Ancient Woodland in response to Action Point 39 from Day 2 of the ISH2 on 16 January 2025 [EV5-004] and in response to the Woodland Trusts Written Representation REP1-089:3 to REP1-089:5.
05	68	18.4.5.3	Minor changes were applied to paragraph 79 to clarify details of the eDNA surveys.
05	75, 76 108 20	18.5.1 18.6.1.3.7 18.6.1.7	Updated total length of hedgerow and hedgerow loss provided, as referenced in **The Applicants Response to Issue Specific Hearing 2 (ISH2) Supplementary Agenda Questions** (ISH2.9.15) [REP1-050] and amendments to hedgerow clearance parameters.
05	106	18.6.1.3.3	Paragraph 256 has been updated with regard to the location of the TCC at the emergency beach access in relation to the existing boat storage area, in response to Action Point 55 from Day 2 of the ISH2 on 16 January 2025 [EV5-004] as detailed in **The Applicants' Responses to January 2025 Action Points (Revision 2**) [AS-155].
05	N/A	N/A	Document references throughout **Chapter 18 Terrestrial Ecology and Ornithology (Revision 5)** [document reference 7.18] have been updated to reflect the most recently submitted versions where relevant.

Revision Change Log			
Rev No.	**Page**	**Section**	**Description**
05	129-130	18.6.1.13.1	This section has been updated to provide clarification on the disturbance of water vole at temporary haul road crossings, in response to Action Point 39 from Day 2 of the ISH2 on 16 January 2025 [EV5-004] as detailed in **The Applicants' Responses to January 2025 Action Points (Revision 2**) [AS-155].
Appendix 18-2 Habitat Survey Report			
02	N/A	Appendix C	Appendix C: Habitat Survey Map has been updated at the request of the ExA in the Rule 4, 6, 9, 13 and 17 Letter [PD-010] to enable the 'no access verges' to be more easily identified.
Appendix 18-5 Bats Report – Ground Level Tree Assessment			
02	N/A	Appendix B	Appendix B: GLTA Survey Map has been updated at the request of the ExA in the Rule 4, 6, 9, 13 and 17 Letter [PD-010] to show only those trees surveyed within the Onshore Development Area and identify which trees, with the potential to support multiple roosting bats, may be impacted as a result of the Projects as referenced in the ES Chapter 18 (Revision 4).
Appendix 18-9 Water Voles and Otters Report			
03	N/A	Appendix D	Appendix D: The boundary of the Onshore Development Area has been updated to match the **Works Plans (Onshore) (Revision 3)** [PDA-003 in response to Action Point 39 from Day 2 of the ISH2 on 16 January 2025 [EV5-004] as detailed in **The Applicants' Responses to January 2025 Action Points (Revision 2**) [AS-155].

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Glossary

Term	Definition
Concurrent Scenario	A potential construction scenario for the Projects where DBS East and DBS West are both constructed at the same time.
Development Scenario	Description of how the DBS East and/or DBS West Projects would be constructed either in isolation, sequentially or concurrently.
Haul Road	The track along the Onshore Export Cable Corridor used by traffic to access different sections of the Onshore Export Cable route for construction.
Horizontal Directional Drill (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.
In Isolation Scenario	A potential construction scenario for one Project which includes either the DBS East or DBS West array, associated offshore and onshore cabling and only the eastern Onshore Converter Station within the Onshore Substation Zone and only the northern route of the onward cable route to the proposed Birkhill Wood National Grid Substation.
Jointing Bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point on the coastline at which the Offshore Export Cables are brought onshore, connecting to the onshore cables at the Transition Joint Bay (TJB) above mean high water.
Landfall Zone	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) and the Transition Joint Bays (TJBs) inclusive of all construction works, including the landfall compounds, Onshore Export Cable Corridor and intertidal working area including the Offshore Export Cables.

Term	Definition
Link Boxes	An underground metal box placed within a concrete pit where the metal sheaths between adjacent export cable sections are connected and earthed, installed with a ground level manhole to allow access to the link box for regular maintenance or fault-finding purposes.
Onshore Converter Stations	A compound containing electrical equipment required to transform and stabilise electricity generated by the Projects so that it can be connected to the electricity transmission network. There will be one Onshore Converter Station for each Project.
Onshore Development Area	The Onshore Development Area for ES is the boundary within which all onshore infrastructure required for the Projects would be located including Landfall Zone, Onshore Export Cable Corridor, accesses, Temporary Construction Compounds and Onshore Converter Stations.
Onshore Export Cable Corridor	This is the area which includes cable trenches, Haul Roads, spoil storage areas, and limits of deviation for micro-siting. For assessment purposes, the cable corridor does not include the Onshore Converter Stations, Transition Joint Bays or temporary access routes; but includes Temporary Construction Compounds (purely for the cable route).
Onshore Export Cables	Onshore Export Cables take the electric from the Transition Joint Bay to the Onshore Converter Stations.
Onshore Substation Zone	Parcel of land within the Onshore Development Area where the Onshore Converter Station infrastructure (including the Haul Roads, Temporary Construction Compounds and associated cable routeing) would be located.
Onward Cable Connection	The cable corridor between the Onshore Substation Zone and the Proposed Birkhill Wood National Grid Substation.

Term	Definition
Ordinary watercourse	Rivers which are not Main Rivers are called 'ordinary watercourses'. Lead local flood authorities, district councils and internal drainage boards carry out flood risk management work on ordinary watercourses.
Other trenchless techniques	Other techniques (aside from HDD) for installation of ducts or cables where trenching may not be suitable such as micro tunnelling or auger boring.
Sequential Scenario	A potential construction scenario for the Projects where DBS East and DBS West are constructed with a lag between the commencement of construction activities. Either Project could be built first.
Temporary Construction Compound	An area set aside to facilitate construction of the Projects. These will be located adjacent to the Onshore Export Cable Corridor and within the Onshore Substation Zone, with access to the highway.
The Applicants	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South Offshore Wind Farms).
Transition Joint Bay (TJB)	The Transition Joint Bay (TJB) is an underground structure at the Landfall that houses the joints between the Offshore Export Cables and the Onshore Export Cables.
Trenching	Open cut method for cable or duct installation.

Acronyms

Term	Definition
AIA	Arboriculture Impact Assessment
BAP	Biodiversity Action Plan
BNG	Biodiversity Net Gain
BoCC	Birds of Conservation Concern
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CEA	Cumulative Effect Assessment
DBS	Dogger Bank South
DCO	Development Consent Order
DLL	District Level Licencing
eDNA	Environmental DNA
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
EPS	European Protected Species
ES	Environmental Statement
FLL	Functionally Linked Land
GB	Great Britain
GCN	Great crested newt (*Triturus cristatus*)
GLTA	Ground Level Tree Assessment
HA	Hectare

Term	Definition
HDD	Horizontal Direction Drill
HRA	Habitats Regulations Assessment
HSI	Habitat Suitability Index
HPI	Habitat of Principal Importance
IDB	Internal Drainage Board
INNS	Invasive non-native species
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LNR	Local Nature Reserve
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographical Information for the Countryside
NERC	Natural Environment and Rural Communities
NEYEDC	North & East Yorkshire Ecological Data Centre
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statements
OCoCP	Outline Code of Construction Practice
OCR	Obstacle Crossing Register
OEMP	Outline Ecological Management Plan
OLMP	Outline Landscape Management Plan
PEIR	Preliminary Environmental Information Report
pSPA	Potential Special Protection Area

Term	Definition
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
T	Transect
TCC	Temporary Construction Compound
WCA	Wildlife and Countryside Act 1981
ZoI	Zone of Influence

18 Terrestrial Ecology and Ornithology

18.1 Introduction

1. This chapter of the Environmental Statement (ES) considers the likely significant effects of the Projects on terrestrial ecology and ornithology. The chapter provides an overview of the existing environment for the proposed Onshore Development Area, followed by an assessment of likely significant effects for the construction, decommissioning and operation of the Projects.

2. The effects on other offshore ecological receptors such as benthic habitats and offshore ecology are considered in **Volume 7, Chapter 9 Benthic Habitats (application ref: 7.9)**, **Volume 7, Chapter 10 Fish and Shellfish Ecology (application ref: 7.10)**, **Volume 7, Chapter 11 Marine Mammals (application ref: 7.11)**, and **Volume 7, Chapter 12 Offshore Ornithology (application ref: 7.12)**. Habitats Regulations Assessment (HRA) matters are addressed as part of the HRA process, see **Report to Inform Appropriate Assessment Habitat Regulations Assessment (Volume 6, application ref: 6.1)** for further details.

3. This chapter should also be read in conjunction with the following linked chapters and reports:

   - **Volume 7, Chapter 8 Marine Physical Environment (application ref: 7.8)**;
   - **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)**;
   - **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**;
   - **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23)**;
   - **Volume 7, Chapter 25 Noise (application ref: 7.25)**;
   - **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**; and
   - **Volume 7, Chapter 30 Climate Change (application ref: 7.30)**.

4. Additional information to support this terrestrial ecology and ornithology chapter include:

   - **Volume 7, Appendix 18-1 Terrestrial Ecology and Ornithology Consultation Responses (application ref: 7.18.18.1)**;
   - **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**;

- **Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**;
- **Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4)**;
- **Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**;
- **Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**;
- **Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**;
- **Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**;
- **Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9) (Revision 2) [document reference 7.18.18.9**; and
- **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10)**.

18.2 Consultation

5. Consultation with regard to terrestrial ecology and ornithology has been undertaken in line with the general process described in **Volume 7, Chapter 7 Consultation (application ref: 7.7)** and the **Consultation Report (Volume 5, application ref: 5.1)**. The key elements to date include EIA Scoping, formal consultation on the Preliminary Environmental Information Report (PEIR) under section 42 of the Planning Act 2008 and the ongoing Evidence Plan Process (EPP) via the terrestrial ecology and ornithology Expert Topic Group (ETG).

6. The feedback received throughout this process has been considered in preparing the ES. This chapter has been updated following consultation in order to produce the final assessment submitted within the Development Consent Order (DCO) application. **Volume 7, Appendix 18-1 (application ref: 7.18.18.1)** provides a summary of the consultation responses received to date of relevance to this topic, and details how the comments have been addressed within this chapter.

18.3 Scope

18.3.1 Effects Scoped In and Scoped Out

7. Effects scoped into the chapter include:

- Construction disturbance to national and internationally statutory designated sites;
- Construction disturbance to non-statutory designated sites;
- Temporary habitat loss and fragmentation during construction;
- Death, injury or disturbance during construction to:
  - Amphibians including GCN;
  - Badger;
  - Foraging and commuting bats;
  - Roosting bats;
  - Breeding birds;
  - Over wintering birds;
  - Otter;
  - Other notable species;
  - Reptiles; and
  - Water vole.
- Habitat and species (as listed above) disturbance from maintenance during the operational phase;
- Species disturbance from artificial lighting for maintenance during the operational phase;
- Permanent habitat loss on habitats and species utilising the habitats lost during the operational phase; and
- Effects scoped in for the decommissioning phase are assumed to be the same as those identified during the construction phase.

8. An assessment of the like significant effects to the onshore habitat sites has been completed in the **Report to Inform Appropriate Assessment Habitat Regulations Assessment (Volume 6, application ref: 6.1)** and detailed in section 18.5.2.

9. Flamborough Head Special Area of Conservation (SAC) has been scoped out as it is designated for habitats (reefs, vegetated sea cliffs of the Atlantic and Baltic Coasts, and submerged or partially submerged sea caves). Therefore, the proposed works within the Onshore Development Area are not expected to impact this designated site, from a terrestrial ecology and ornithology view.

10. Hazel dormouse have been scoped out of the assessment as the Projects are located outside the species known distribution. Therefore, mitigation is not currently required. However, in the unlikely event that hazel dormice are found in the Onshore Development Area at any time during the works, works must stop immediately and advice sought from ECoW and / or Natural England.

11. White-clawed crayfish have been scoped out of the assessment due to the absence of records in the area and their known distribution ranges. Therefore, mitigation is not currently required. However, in the unlikely event that white-clawed crayfish are found in the Onshore Development Area at any time during the works, works must stop immediately and Natural England consulted.

12. Two European Protected Species (EPS), smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis*, have been scoped out of the assessment due to their southern distribution ranges which do not interact with the Onshore Development Area.

13. Other reptile species (adder *Vipera berus*, grass snake *Natrix helvetica* (previously *Natrix natrix)*, slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara* have been scoped out from needing further survey due to the habitats present within the Onshore Study Area. However, they are likely to be present in low numbers so mitigation measures will be required, and this is discussed further in **Table 18-4**.

14. There are numerous watercourses within the Onshore Study Area which could provide suitable habitat for protected fish species. However, as trenchless technique is being implemented under watercourses know to be suitable habitat, they have been scoped out of the assessment.

15. Lamprey have been scoped out following advice from the Environment Agency that the River Hull is not considered a hotspot for the species. Furthermore, impacts to the River Hull will be minimised by the use of trenchless techniques for the crossing of the Onshore Export Cables.

18.3.2 Study Area

16. The terrestrial ecology and ornithology study area has been defined on the basis of a species dependent buffer around the Onshore Development Area (**Volume 7, Figure 18-1 (application ref: 7.18.1)**). The Onshore Development Area covers land located within the East Riding of Yorkshire down to the Mean Low Water Spring Tide Mark (MLWS).

17. The study areas for each species surveyed is outlined in Table 18-1.

18. These study areas were selected according to the appropriate standard industry guidance which is presented in Study Area 18.3.2, as well as using professional judgement and experience. These study areas were agreed with stakeholders (i.e. Natural England, Environment Agency, Yorkshire Wildlife Trust, and East Riding of Yorkshire Council) as part of the Terrestrial Ecology and Ornithology ETG meeting held in March 2022 and detailed in **Volume 7, Appendix 18-1 (application ref: 7.18.18.1)**.

Table 18-1 Study Area for Each Species Surveyed for the Projects

Species	Study Area
Amphibians, including Great Crested Newt (GCN)	All areas within the Onshore Development Area plus a 250m buffer. Plus, ponds outside of 250m where there was good terrestrial connectivity with the Onshore Development Area and/or groups of ponds which could support GCN metapopulations.
Badger	Within the Onshore Development Area plus 30m buffer.
Bats	Transect routes and fixed points along the Onshore Development Area.
Birds	Transect routes and fixed points along the Onshore Development Area.
Otter	All watercourses within the Onshore Development Area plus a 50m buffer.
Water vole	All watercourses within the Onshore Development Area plus a 50m buffer.
Invasive non-native species (INNS)	No specific survey but covered by the habitat surveys of the Onshore Development Area.

18.3.3 Realistic Worst Case Scenario

18.3.3.1 General Approach

19. The realistic worst case design parameters for likely significant effects scoped into the ES for the terrestrial ecology assessment are summarised in Table 18-2. These are based on the project parameters described in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**, which provides further details regarding specific activities and their durations.

20. In addition to the design parameters set out in **Table 18-2** consideration is also given to the different Development Scenarios still under consideration and the possible phasing of the construction as set out in sections 18.3.3.2 to 18.3.3.4.

Table 18-2 Realistic Worst Case Design Maximum Parameters

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
Construction				
Intertidal	• Number of support vessels: 2 • Number of pontoons: 1 • Pontoon working area (m): 12x50 • Number of trenchless crossing exits: 3 • Dimensions of exit pits (m): 20x10 per trenchless crossing exit • Dimensions for offshore cable extents –20m offshore cable disturbance per cable • Emergency vehicle access on the beach but not accessed from the landward side • There would be no permanent infrastructure in the intertidal • Duration of works in the intertidal zone (months): 18 (not continuous)	• Number of support vessels: 2 • Number of pontoons: 1 • Pontoon working area (m): 12x50 • Number of trenchless crossing exits: 6 • Dimensions of exit pits (m): 20x10 per trenchless crossing exit • Dimensions for offshore cable extents – 20m offshore cable disturbance per cable • Emergency vehicle access on the beach but not accessed from the landward side • There would be no permanent infrastructure in the intertidal • Duration of works in the intertidal zone (months): 18 (not continuous)	• Number of support vessels: 2 • Number of pontoons: 1 • Pontoon working area (m): 12x50 • Number of trenchless crossing exits: 6 • Dimensions of exit pits (m): 20x10 per trenchless crossing exit • Dimensions for offshore cable extents –20m offshore cable disturbance per cable • Emergency vehicle access on the beach but not accessed from the landward side • There would be no permanent infrastructure in the intertidal • Duration of works in the intertidal zone (months): 48 (not continuous).	Worst case scenario for terrestrial ecology and ornithology is DBS East and West sequentially due to the increased duration.
Landfall Zone	• Total Landfall Zone area: 420,000m^2 • Number of completed trenchless crossing ducts (maximum): 3 (2 for power cables, 1 for fibre optic cables) • Indicative trenchless crossing depth (m): 20 • No. of Transition Joint Bays: 2 • Transition Joint Bay dimensions (m): 5 x 20	• Total Landfall Zone area: 420,000m^2 • Number of completed trenchless crossing ducts (maximum): 6 (4 for power cables, 2 for fibre optic cables) • Indicative trenchless crossing depth (m): 20 • No. of Transition Joint Bays: 4 • Transition Joint Bay dimensions (m): 5 x 20	• Total Landfall Zone area: 420,000m^2 • Number of completed trenchless crossing ducts (maximum): 6 (4 for power cables, 2 for fibre optic cables) • Indicative trenchless crossing depth (m): 20 • No. of Transition Joint Bays: 4 • Transition Joint Bay dimensions (m): 5 x 20	The trenchless crossing works should not require any prolonged periods of restrictions or closures to the beach for public access, although it is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access.

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	• Permanent land take for TJBs (m^2): 200 – including below ground infrastructure • Number of Link Boxes (2.5 x 4m): 2 – the only above ground infrastructure • Permanent land take for total number of Link Boxes (m^2): 20 • Landfall TJB compound works area (m): 110 x 75 • Landfall satellite compound (m): 75x 75 • Temporary access: Route from the existing road system • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Duration of works: 18 months overall (not continuous)	• Permanent land take for TJBs (m^2): 400 – including below ground infrastructure • Number of Link Boxes (2.5 x 4m): 4 – the only above ground infrastructure • Permanent land take for total number of Link Boxes (m^2): 40 • Landfall TJB compound works area (m): 190 x 75 • Landfall satellite compound (m): 75x 75 Temporary access: Route from the existing road system • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Duration of works: up to 18 months overall (not continuous)	• Permanent land take for TJBs (m^2): 400 – including below ground infrastructure • Number of Link Boxes (2.5 x 4m): 4 – the only above ground infrastructure • Permanent land take for total number of Link Boxes (m^2): 40 • Landfall TJB compound works area (m): 190 x 75 • Landfall satellite compound (m): 75x 75 Temporary access: Route from the existing road system • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Duration of works: up to 48 months overall (not continuous)	The TJB compound works area and TJBs locations within the Landfall Zone are subject to detailed design. The TJB's would be at set back from the cliffs to account for potential coastal erosion over time. The worst case scenario is DBS East and West sequentially. As this has the most permanent land take and the longest duration of works.
Onshore Export Cable Corridor from Landfall Zone to the Onshore Substation Zone	• Indicative corridor length between Landfall Zone and the Substation Zone (km): 32 • Number of export circuits: 1 (HVDC) • Number of power cables per circuit: 2 (HVDC) • Number of fibre optic (communication) cables per circuit: 1 • Number of earth cables per circuit: 1 • Number of trenches: Up to 2 • Cable duct trench dimensions: 1.1m base to 3.9m surface for each single.	• Indicative corridor length between Landfall Zone and the Substation Zone (km): 32 • Number of export circuits: 2 (HVDC) • Number of power cables per circuit: 2 (HVDC) • Number of fibre optic (communication) cables per circuit: 1 • Number of earth cables per circuit: 1 • Number of trenches: Up to 4	• Indicative corridor length between Landfall Zone and the Substation Zone (km): 32 • Number of export circuits: 2 (HVDC) • Number of power cables per circuit: 2 (HVDC) • Number of fibre optic (communication) cables per circuit: 1 • Number of earth cables per circuit: 1 • Number of trenches: Up to 4	Deeper burial depth may be required if open cut crossing of obstacle such as utility / watercourse / road etc. The worst case scenario is DBS East and West sequentially because it has the longest duration of works and the greater works area.

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	3.35m base to 6.15m surface for dual HVDC • Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including Landfall Zone satellite compound) • Size of main construction compound (m^2): 10,000 (roughly 100x100m)[1] • Size of satellite construction compounds (m^2): 5625 (roughly 75x75m) • Cable corridor width (m): 41 • Cable corridor width at trenchless crossings (m): 45 • Approximate depth of trench to top of duct / cables (m): 1.3 – 1.7 • Maximum burial depth (m) where restrictions are not present: 2 • Indicative burial depth (m): 1.6 • Jointing Bays (km): every 0.75 – 1.5 • Indicative number of Jointing Bays: 103 • Jointing Bay construction dimensions (per bay) (m): 10 x 25 • Jointing Bay infrastructure dimensions (all below ground) (m): 3x8	• Cable duct trench dimensions: 1.1m base to 3.9m surface for each single. 3.35m base to 6.15m surface for dual HVDC • Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including Landfall Zone satellite compound) • Size of main construction compound (m^2): 10,000 (roughly 100x100m) • Size of satellite construction compounds (m^2): 5625 (roughly 75x75m) • Cable corridor width (m): 75 • Cable corridor width at trenchless crossings (m): 90 • Approximate depth of trench to top of duct / cables (m): 1.3 – 1.7 • Maximum burial depth (m) where restrictions are not present: 2 • Indicative burial depth (m): 1.6 • Jointing Bays (km): every 0.75 – 1.5 • Indicative number of Jointing Bays: 205 • Jointing Bay construction dimensions (per bay): 10 x 25m	• Cable duct trench dimensions: 1.1m base to 3.9m surface for each single. 3.35m base to 6.15m surface for dual HVDC • Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including Landfall Zone satellite compound) • Size of main construction compound (m^2): 10,000 (roughly 100x100m) • Size of satellite construction compounds (m^2): 5625 (roughly 75x75m) • Cable corridor width (m): 75 • Cable corridor width at trenchless crossings (m): 90 • Approximate depth of trench to top of duct / cables (m): 1.3 – 1.7 • Maximum burial depth (m) where restrictions are not present: 2 • Indicative burial depth (m): 1.6 • Jointing Bays (km): every 0.75 – 1.5 • Indicative number of Jointing Bays: 205 • Jointing Bay construction dimensions (per bay): 10 x 25m	

[1] Actual size may vary due to site specifics

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	• Jointing Bay burial depth from existing ground level to bottom of Jointing Bay (m): 2.2 • Jointing Bay depth from existing ground level to top of Jointing Bay (m): 1.35m • Number of Earth / Link Boxes and associated manhole covers: 103 • Link box dimensions / manhole cover permanent infrastructure above ground (m): 2.5x4 • Link box construction dimensions (m): 6.5x8 • Access routes: Various from public highway to single tracks as shown on **Volume 7, Figure 5-3 (application ref: 7.5.1)** • Haul Road: 5m (increasing to 8m at passing places) • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Approximate permanent easement along the cable corridor (m): 15 • Expected maximum trenchless crossing depth (m): 20 • Trenchless crossing compound dimensions: 60 x 40m assumed for the Project's compounds on each side of the obstacle (entry and exit compounds).	• Jointing Bay infrastructure dimensions (all below ground) (m): 3x8 • Jointing Bay burial depth from existing ground level to bottom of Jointing Bay (m): 2.2 • Jointing Bay depth from existing ground level to top of Jointing Bay (m): 1.35m • Number of Earth / Link Boxes and associated manhole covers: 205 • Link box dimensions / manhole cover permanent infrastructure above ground (m): 2.5x4 • Link box construction dimensions (m): 6.5x8 • Access routes: Various from public highway to single tracks as shown on **Volume 7, Figure 5-3 (application ref: 7.5.1)** • Haul road: 5m (increasing to 8m at passing places) • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Approximate permanent easement along the cable corridor (m): 24. • Expected maximum trenchless crossing depth (m): 20 • Trenchless crossing compound dimensions: 60 x 40m per project assumed for the Project's compounds on each side of the	• Jointing Bay infrastructure dimensions (all below ground) (m): 3x8 • Jointing Bay burial depth from existing ground level to bottom of Jointing Bay (m): 2.2 • Jointing Bay depth from existing ground level to top of Jointing Bay (m): 1.35m • Number of Earth / Link Boxes and associated manhole covers: 205 • Link box dimensions / manhole cover permanent infrastructure above ground (m): 2.5x4 • Link box construction dimensions (m): 6.5x8 • Access routes: Various from public highway to single tracks as shown on **Volume 7, Figure 5-3 (application ref: 7.5.1)** • Haul Road: 5m (increasing to 8m at passing places) • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Approximate permanent easement along the cable corridor (m): 24. • Expected maximum trenchless crossing depth (m): 20 • Trenchless crossing compound dimensions: 60 x 40m per project assumed for the Project's	

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	• No. of trenchless crossings compounds: Min 41 and up to maximum of 147 entry compounds • Min 41 and up to maximum of 147 exit compounds • All other crossings assumed to be open cut (see **Volume 7, Obstacle Crossing Register (application ref: 7.5.5.2)**) • Total onshore cable corridor works area (est.) (m^2): 4,252,209 • Duration: 33 months	obstacle (entry and exit compounds). • No. of trenchless crossings compounds: Min 82 and up to maximum of 294 entry compounds • Min 82 and up to maximum of 294 exit compounds • All other crossings assumed to be open cut (see **Volume 7, Obstacle Crossing Register (application ref: 7.5.5.2)**) • Total onshore cable corridor works area (est.) (m^2): 4,503,397 • Duration: 33 months	compounds on each side of the obstacle (entry and exit compounds). • No. of trenchless crossings compounds: Min 82 and up to maximum of 294 entry compounds • Min 82 and up to maximum of 294 exit compounds • All other crossings assumed to be open cut (see **Volume 7, Obstacle Crossing Register (application ref: 7.5.5.2)**) • Total onshore cable corridor works area (est.) (m^2): 4,503,397 • Duration of works: up to 57 months overall (note this would not be continuous working within that timeframe)	

Onshore Substation Zone	• Operational compounds for Onshore Converter Station (m): 244 x 264 (HVDC Converter)
	• Permanent area (m^2): 64,000m^2 (based on one HVDC converter station)
	• Total construction area (m^2): 94,000 (based on one HVDC Converter Station + Temporary Construction Compound area)
	  ○ Area of Converter station (m^2): 64,000
	  ○ No. of Converter Station compounds: 1 main temporary
		• Operational compounds for Onshore Converter Station (m): 244 x 264 (HVDC Converter) plus 244 x 264 (HVDC Converter)
		• Permanent area (m^2): 129,000(based on two HVDC converter stations)
		• Total construction area (m^2): 189,000 (based on two HVDC Converter Stations + Temporary Construction Compound areas)
		  ○ Area of Converter station(s) (m^2): 129,000
		  ○ No. of Converter Station compounds: 2 (1 main Temporary
			• Operational compounds for Onshore Converter Station (m): 244 x 264 (HVDC Converter) plus 244 x 264 (HVDC Converter)
			• Permanent area (m^2): 129,000 (based on two HVDC converter stations)
			• Total construction area (m^2): 189,000 (based on two HVDC Converter Stations + Temporary Construction Compound areas)
			  ○ Area of Converter station(s) (m^2): 129,000
			  ○ No. of Converter Station compounds: 2 (1 main Temporary
				The concurrent and Sequential Scenarios will involve a greater extent of construction works. The Sequential Scenario will result in the longest duration.
				
				The worst case scenario is DBS East and West sequentially because it has the longest duration of works and the greater works area.

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	compound (3 location options identified) ○ Converter Station compound (m^2): 30,000 • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Duration: 4 years	Construction Compound and 1 satellite Temporary Construction Compound) ○ Converter Station compounds total area (m^2): 60,000 • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Duration: 4 years	Construction Compound and 1 satellite Temporary Construction Compound) ○ Converter Station compounds to-tal area (m^2): 60,000 • Temporary lighting during working hours. Temporary out-of-hours security lighting. • Duration: 6 years	
Onward Cable Connection to the Proposed Birkhill Wood National Grid Substation	• Onward corridor length from Onshore Converter Station to the proposed Birkhill Wood National Grid Substation (km): 2.5 • Number of export circuits: 4x400kV • Technology: HVAC • Cabling from Onshore Converter Station to National Grid Substation: Buried • General cable corridor approximate permanent easement swathe (m): 20 • Cable corridor construction swathe (m): 53.5 • Cable construction satellite construction compound dimensions (m): 75x75 • Number of earth / Link Boxes: 35	• Onward corridor length from Onshore Converter Station to the proposed Birkhill Wood National Grid Substation (km): 2.5 • Number of export circuits: 8x400kV • Technology: HVAC • Cabling from Onshore Converter Station to National Grid Substation: Buried • General cable corridor approximate permanent easement swathe (m): 34 • Cable corridor construction swathe (m): 100 • Cable construction satellite construction compound dimensions (m): 75x75 • Number of earth / Link Boxes: 70	• Onward corridor length from Onshore Converter Station to the proposed Birkhill Wood National Grid Substation (km): 2.5 • Number of export circuits: 8x400kV • Technology: HVAC • Cabling from Onshore Converter Station to National Grid Substation: Buried • General cable corridor approximate permanent easement swathe (m): 34 • Cable corridor construction swathe (m): 100 • Cable construction satellite construction compound dimensions (m): 75x75 • Number of earth / Link Boxes: 70	The worst case scenarios are DBS East and West sequentially or concurrently because they have larger construction swathe than the In Isolation Scenario.

Impacts	Parameter			
	DBS East or DBS West In Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and Rationale
Operation and Maintenance				
Landfall Zone	• Permanent aboveground infrastructure: TJBs infrastructure • Permanent land take for the total number of TJBs (m^2): 200 • Number of manhole covers within Landfall Zone: 2 • Total area of permanent land take for manhole covers above ground (m^2): 20 • All other construction disturbance restored to pre-existing condition.	• Permanent aboveground infrastructure: TJBs infrastructure • Permanent land take for the total number of TJBs (m^2): 400 • Number of manhole covers within Landfall Zone: 4 • Total area of permanent land take for manhole covers above ground (m^2): 40 • All other construction disturbance restored to pre-existing condition.	• Permanent aboveground infrastructure: TJBs infrastructure • Permanent land take for the total number of TJBs (m^2): 400 • Number of manhole covers within Landfall Zone: 4 • Total area of permanent land take for manhole covers above ground (m^2): 40 • All other construction disturbance restored to pre-existing condition.	There is no substantive difference in the likely effects of the different scenarios. The worst case scenarios are DBS East and West sequentially or concurrently because they have the larger total areas of permanent land take.
Onshore Export Cable route from Landfall Zone to the Onshore Substation Zone	• Jointing Bay permanent infrastructure dimensions (all below ground): 3x8m • Jointing Bay depth (m): 2.2 (from existing ground level to the bottom of the joint bay) • Number of Earth/Link Boxes (buried, manhole at the surface and the only above ground permanent infrastructure along the cable corridor): up to 103 (up to 2 Link Boxes per HVDC circuit) • Link Box dimensions (permanent infrastructure/manhole covers) (m): 2.5x4 • Total permanent land take for Link Boxes/manhole covers (m^2): 1,030 • All construction disturbance restored to pre-existing condition • Approximate permanent easement along the cable corridor (m): 15.	• Jointing Bay permanent infrastructure dimensions (all below ground): 3x8m • Jointing Bay depth (m): 2.2 (from existing ground level to the bottom of the joint bay) • Number of Earth/Link Boxes (buried, manhole at the surface and the only above ground permanent infrastructure along the cable corridor): up to 205 (up to 2 Link Boxes per HVDC circuit) • Link Box dimensions (permanent infrastructure/manhole covers) (m): 2.5x4 • Total permanent land take for Link Boxes /manhole covers (m^2): 2,050 • All construction disturbance restored to pre-existing condition	• Jointing Bay permanent infrastructure dimensions (all below ground): 3x 8m • Jointing Bay depth (m): 2.2 (from existing ground level to the bottom of the joint bay) • Number of Earth/ Link Boxes (buried, manhole at the surface and the only above ground permanent infrastructure along the cable corridor): up to 205 (up to 2 Link Boxes per HVDC circuit) • Link Box dimensions (permanent infrastructure/manhole covers) (m): 2.5x4 • Total permanent land take for Link Boxes /manhole covers (m^2): 2,050 • All construction disturbance restored to pre-existing condition	There is no substantive difference in the likely effects of the different scenarios. The worst case scenarios are DBS East and West sequentially or concurrently because they have the larger total areas of permanent land take.

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	• Hedgerow trees cannot be replanted over the cable easement	• Approximate permanent easement along the cable corridor (m): 24 • Hedgerow trees cannot be replanted over the cable easement	• Approximate permanent easement along the cable corridor (m): 24. • Hedgerow trees cannot be replanted over the cable easement	

Onshore Substation Zone	• Permanent Onshore Converter station area (m^2); 64,416 (244m x 264m) (based on one HVDC converter station)
	• Converter Station buildings:
	  ○ Tallest structure (m): 27 (lightning masts)
	  ○ Building height (m): 24
	  ○ Largest building footprint (m): 60x45
	• Converter Station laid out with large buildings to the south.
	• Implementation of landscape screening in accordance with **Volume 7, Figure 23-6 Indicative Landscape Plan (application ref: 7.23.1).** Worst case considers year 1, before planting matures.
	• All other construction disturbance restored to pre-existing condition.
	• Security /operational lighting within the compound
	• Operational duration: 30 years
		• Permanent Onshore Converter station area (m^2): 128,832 (244m x 264m plus 244m x 264m) (based on two HVDC converter stations)
		• Converter Station buildings:
		  ○ Tallest structure (m): 27 (lightning masts)
		  ○ Building height (m): 24
		  ○ Largest building footprint (m): 60x45
		• Converter Station laid out with large buildings to the south.
		• Implementation of landscape screening in accordance with **Volume 7, Figure 23-6 Indicative Landscape Plan (application ref: 7.23.1).** Worst case considers year 1, before planting matures.
		• All other construction disturbance restored to pre-existing condition.
		• Security /operational lighting within the compound
		• Operational duration: 30 years
			• Permanent Onshore Converter station area (m^2): 128,832 (244m x 264m plus 244m x 264 m) (based on two HVDC converter stations)
			• Converter Station buildings:
			  ○ Tallest structure (m): 27 (lightning masts)
			  ○ Building height (m): 24
			  ○ Largest building footprint (m): 60x45
			• Converter Station laid out with large buildings to the south.
			• Implementation of landscape screening in accordance with **Volume 7, Figure 23-6 Indicative Landscape Plan (application ref: 7.23.1).** Worst case considers year 1, before planting matures.
			• All other construction disturbance restored to pre-existing condition.
			• Security /operational lighting within the compound
			• Operational duration: 32 years
				The concurrent and Sequential Scenarios will require two converter stations within the Onshore Substation Zone and therefore will have greater effects than DBS West or DBS East In Isolation. The Sequential Scenario will result in a slightly longer operational duration, due to the assumed two-year lag in construction between the two Projects. Therefore, the DBS East and DBS West Sequential Scenario is considered worst case and assessed in this Chapter.
				
				The worst case scenario is DBS East and West sequentially because it has the largest land take as well as the longest operation period.

Impacts	Parameter			
	DBS East or DBS West In Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
Onshore Onward Cable Route to the Proposed Birkhill Wood National Grid Substation	• 35 manholes at the surface • Approximate total area of permanent land take for Link Boxes/manhole covers (m^2): 350 • General cable corridor approximate permanent easement swathe (m): 20 • Hedgerow trees cannot be replanted over the cable easement	• 70 manholes at the surface • Approximate total area of permanent land take for Link Boxes/manhole covers (m^2): 700 • General cable corridor approximate permanent easement swathe (m): 34 • Hedgerow trees cannot be replanted over the cable easement	• 70 manholes at the surface • Approximate total area of permanent land take for Link Boxes/manhole covers (m^2): 700 • General cable corridor approximate permanent easement swathe (m): 34 • Hedgerow trees cannot be replanted over the cable easement	The worst case scenarios are DBS East and West sequentially or concurrently because they have the larger total areas of permanent land take.
Decommissioning				
No final decision regarding the final decommissioning policy for the onshore project infrastructure including Landfall, Onshore Export Cable Corridor and Onshore Converter Stations has yet been made. It is also recognised that legislation and industry best practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled wherever possible and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase. A decommissioning plan for the onshore works would be submitted prior to any decommissioning commencing.			

18.3.3.2 Development Scenarios

21. Following Statutory Consultation, high voltage alternating current (HVAC) technology (previously assessed in PEIR) was removed from the Projects' design envelope (see **Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4)** for further information). As a result, only high voltage direct current (HVDC) technology has been taken forward for assessment purposes. The ES considers the following Development Scenarios:

    - Either DBS East or DBS West is built in isolation; or
    - DBS East and DBS West are both built either sequentially or concurrently.

22. An In Isolation Scenario has been assessed within the ES on the basis that theoretically one Project could be taken forward without the other being built out. If an In Isolation Scenario is taken forward, either DBS East or DBS West may be constructed. As such the onshore assessment considers both DBS East and DBS West In Isolation.

23. If an In Isolation Scenario is taken forward, only the eastern Onshore Converter Station within the Onshore Substation Zone would be constructed. In either the concurrent or Sequential Scenario, both Onshore Converter Station locations within the Onshore Substation Zone would be taken forward for the onshore assessment.

24. In order to ensure that a robust assessment has been undertaken, all Development Scenarios have been considered to ensure the realistic worst case scenario for each topic has been assessed. A summary is provided here, and further details are provided in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**.

25. The three Development Scenarios to be considered for assessment purposes are outlined in **Table 18-3**.

Table 18-3 Development Scenarios and Construction Durations

Development Scenario	Description	Total Maximum Construction Duration (Years)	Maximum Construction Duration Offshore (Years)	Maximum Construction Duration Onshore (Years)
In Isolation	Either DBS East or DBS West is built In Isolation.	Five	Five	Four
Sequential	DBS East and DBS West are both built Sequentially, either Project could commence construction first with staggered / overlapping construction.	Seven	A five year period of construction for each project with a lag of up to two years in the start of construction of the second project (excluding landfall duct installation) – reflecting the maximum duration of effects of seven years.	Construction works (i.e. onshore cable civil works, including duct installation) to be completed for both Projects simultaneously in the first four years, with additional works at the landfall, substation zone and cable joint bays in the following two years. Maximum duration of effects of six years.
Concurrent	DBS East and DBS West are both built Concurrently reflecting the maximum peak effects.	Five	Five	Four

26. Any differences between the Projects, or differences that could result from the manner in which the first and the second Projects are built (Concurrent or Sequential and the length of any lag) are identified and discussed where relevant in section 18.6. For each potential impact, the worst case construction scenario for the In Isolation Scenario and the concurrent or Sequential Scenario is presented. The worst case scenario presented for the Concurrent or Sequential Scenario will depend on which of these is the worst case for the potential impact being considered. The justification for what constitutes the worst case is provided, where necessary, in section 18.6.

18.3.3.3 Operation Scenarios

27. Operation scenarios are described in detail in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**. The assessment considers the following scenarios:

- Only DBS East in operation;
- Only DBS West in operation; and
- DBS East and DBS West operating concurrently with or without a lag of up to two years between each Project commencing operation.

28. If the Projects are built using a phased approach, there would also be a phased approach to starting the operational phase. The worst case scenario for the operational phases for the Projects have been assessed. See section 5.1.1 of **Volume 7, Chapter 5 Project Description (application ref: 7.5)** for further information on phasing scenarios for the Projects.

29. The operational lifetime of each Project is expected to be 30 years for an In Isolation and Concurrent Scenario and 32 years for a Sequential Scenario.

18.3.3.4 Decommissioning Scenarios

30. Decommissioning scenarios are described in **Volume 7, Chapter 5 Project Description (application ref: 7.5).** Decommissioning arrangements would be agreed through the submission of a Decommissioning Plan to be submitted and approved following cessation of commercial operation prior to decommissioning commencing. For the purpose of this assessment it is assumed that decommissioning of the Projects could be conducted separately, or at the same time.

18.3.4 Embedded Mitigation

31. This section outlines the embedded mitigation relevant to the Terrestrial Ecology and Ornithology assessment, which has been incorporated into the design of the Projects or constitutes standard mitigation measures for this topic (**Table 18-4**). Where additional mitigation measures are proposed, these are detailed in the impact assessment (section 18.6).

Table 18-4 Embedded Mitigation Measures

Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Outline Code of Construction Practice (OCoCP)	The **OCoCP (Volume 8, application ref: 8.9)** outlines the control measures and standards that will be implemented to control the impacts on the environment.	DCO Requirement 19
Ecological Management Plan	An Ecological Management Plan (EMP) will be developed in accordance with the **Outline Ecological Management Plan (OEMP) (Volume 8, application ref: 8.10).** The OEMP includes but is not limited to pre-construction, construction, and post-mitigation measures relating to habitats, hedgerows, birds, bats, badgers, otters, water voles, reptiles, GCN, and other protected or notable species where relevant. The EMP will include details of any long-term mitigation and management measures relevant to terrestrial ecology and ornithology and nature conservation. The EMP will be developed in consultation with the relevant stakeholders.	DCO Requirement 12
Routing	The route of the Onshore Export Cable Corridor has been determined as part of a detailed site selection process (**Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4**)). The Onshore Export Cable Corridor has been designed to avoid sensitive landscape elements, such as woodland, buildings and trees, where the loss of such features would be detrimental to the character of the area.	DCO Schedule 1
Designated Sites	Statutory designated sites for nature conservation have been avoided wherever possible as part of the site selection and route planning process. In addition, the Applicants have committed to reinstating all LWS habitat after construction. Multiple non-statutory sites do lie wholly or partially within the Onshore Study Area. Although most impacts on the Nunkeeling Lane Local Wildlife Site (LWS) will be avoided by the selection of a trenchless crossing technique such as HDD, a small section will be affected by the construction of a temporary Haul Road crossing. Similarly, trenchless crossing techniques will also be employed at Beeford-Dunnington Road Verge LWS but a short section of the LWS will be affected by the construction of a temporary Haul Road crossing **Volume 7, Appendix 5-2 Obstacle Crossing Register (application ref: 7.5.5.2).** All LWS habitat will be reinstated following construction in consultation with ERYC and the Yorkshire Wildlife Trust, additional mitigation is discussed in **Table 18-14.** The Substation Zone has been designed to avoid direct impacts on Bentley Moor Wood LWS. Other sites will be protected using other mitigation measures including buffers and dust suppression techniques as outlined within the **OEMP (Volume 8, application ref: 8.10)**.	DCO Schedule 1
Habitat Loss	Habitats between Jointing Bays will have topsoil and subsoil reinstated within two years from the start of construction i.e. from the point at which habitat is removed from any one area. Areas allocated for Temporary Construction Compounds (TCCs) and Haul Roads will be reinstated when construction has been completed. Permanent habitat loss has been minimised during the site selection and route refinement process of the Projects, with the most sensitive habitats, being avoided where possible. Sensitive habitats are defined as those listed as high or very high importance as described in **Table 18-19**. The lowland fen is classified as an irreplaceable habitat, regardless of the condition it is in. Trenchless crossing techniques, such as HDD, will be used to avoid any impacts on the lowland fen habitat. The Haul Road design has been amended from the PEIR to avoid any direct impacts on the habitat, as detailed in **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**. The lowland fen is to be considered a no-go area for construction machinery and/ or for storage of materials or equipment.	DCO Schedule 12

Parameter	Embedded Mitigation Measures	Where Commitment is Secured
	At the emergency beach access, the area will be re-surveyed prior to construction to identify the extent of maritime cliff and slope priority habitat present and changes to the environment as a result of coastal erosion. Where the habitat is still present, suitable ground protection matting will be used to safeguard the habitat when the temporary access to the beach is built and will be monitored throughout the construction period. All temporary and permanent habitat loss will be kept to a minimum, where possible.	
Cable Crossings beneath Main Rivers	All Main Rivers will be crossed using trenchless techniques such as HDD to avoid direct interaction with these watercourses. The crossing methodology will be agreed with the Environment Agency prior to construction. Trenchless crossing methodologies entry and exit points will be located at least 20m from Environment Agency surface water courses or the landward toe of the Environment Agency surface watercourse's flood defences and would be installed at a depth to minimise potential interaction with current, or any planned, infrastructure (e.g., sheet piles), at least 2m below the channel bed. In line with Environment Agency consultation any Haul Road crossing points, would use clear span crossings, where possible.	DCO Requirement 19
Cable Crossing beneath Ordinary Watercourses	Ordinary watercourses may be undertaken by open cut trenching methods. In such cases, temporary measures will be employed to maintain flow of water along the watercourse. The crossing methodology for all water courses is set out in the **Volume 7, Appendix 5-2 Obstacle crossing register (application ref: 7.5.5.2)** Trenchless crossing methodologies (e.g. HDD) entry and exit points will be located at least 9m away from IDB and ordinary surface watercourses to ensure the ongoing maintenance of IDB drains. The detailed methodology to be used for any temporary construction at crossing points over existing ditches and watercourses shall be agreed with the Environment Agency, LLFA and Internal Drainage Board (IDB), as appropriate. See Crossing Method Statement(s), below. A 6m wide strip from the outside edge of any pipe which is forming a culverted IDB watercourse will be maintained during both construction and once it is located in situ to enable access and to prevent damage. If temporary culverts are needed, they will be adequately sized to avoid impounding flows (including allowing for increased winter flows as a result of climate change) and the invert set below bed level to allow bedload transport. As referenced in the **OCoCP (Volume 8, application ref: 8.9)** where temporary dams are used: • The Onshore Export Cables will be set below the channel bed at a depth dependent on local geology and geomorphological risks. This would avoid exposure during periods of higher energy flow when the bed could be mobilised. This depth takes into consideration anticipated climate-change related changes in fluvial flows and erosion that will occur over time; • The amount of time that temporary dams or flumes are in place will be kept to a minimum; • Flumes or pumps would be adequately sized to ensure that flows downstream are maintained whilst minimising upstream impoundment; • A sediment/ siltation trap would be installed upstream of any temporary dams, the contractor should remove excess sediment before, or as they remove the temporary dam, to stop mobilisation downstream once works complete; • A silt trap would also be installed downstream to of the temporary dam to capture any sediment that is over pumped, for lower flows this could also be captured by the use of hay bales or similar;	DCO Requirement 19

Parameter	Embedded Mitigation Measures	Where Commitment is Secured
	• A review of the weather forecast, and any flood alerts will be undertaken, to ensure works are not undertaken during flood events or adverse weather conditions; • Scour protection would also be used to protect the riverbed downstream of the dam from high energy flow at the outlets of flumes and pumps; • If a diversion channel is required, geotextiles or similar techniques will be used to line the channel and prevent sediment entering the watercourse; • Vegetation would not be removed from the banks unless necessary to undertake the works, in which case removal would be restricted to the smallest practicable footprint; • Channel bed and banks would be sympathetically reinstated (e.g. by replacing re-sectioned banks with more natural profiles that are typical of the natural geomorphology of the watercourse) avoiding very wet weather conditions at any time of the year; • Prior to dewatering the area between the temporary dams, a fish rescue would be undertaken; and • Pumps would be fitted with 2mm diameter mesh for over-pumping of watercourses where fish could be present.	
Crossing Method Statements	As referenced in the **OCoCP (Volume 8, application ref: 8.9**) the Contractor will be required to prepare a Crossing Method Statement prior to Construction. This will set out construction operations to be undertaken (including construction methods and types of plant required) and the associated environmental and health and safety issues for certain crossings where an increased risk is identified. The method statements will include details of crossing techniques to be deployed at crossings, including sensitive environmental crossings (such as Main Rivers). These will be developed with the relevant asset owner or key stakeholder such as the Environment Agency, IDB or ERYC.	DCO Requirement 19
Hydrogeological Risk Assessments	Ground investigations and a hydrogeological risk assessment meeting the requirements of the Environment Agency's approach to groundwater protection (Environment Agency, 2018) would be undertaken at each trenchless crossing location. Where the Projects cross watercourses connected to sites of particular sensitivity (e.g. Sites of Special Scientific Interest (SSSI) or groundwater Source Protection Zones (SPZs)) a hydrogeological risk assessment will be undertaken to inform the site specific crossing method statement. The risk assessment, which would be desk-based, follows a tiered approach with more detailed assessments carried out in areas considered to be a potentially greater risk to groundwater. The production of the hydrogeological risk assessment would be undertaken prior to the commencement of construction works (should one be deemed necessary) and meet the requirements of Environment Agency's Approach to Groundwater Protection 2018 Framework.	DCO Requirement 19
Drilling Fluid Breakout Management Plan	A Drilling Fluid Breakout Management Plan will be agreed with the Environment Agency prior to commencement of construction activities. Bentonite or another inert clay-based material (comprising 95% water and 5% clay) would be used as a lubricant at the drill head for trenchless crossing techniques.	DCO Requirement 19
Hedgerows	For an In Isolation Scenario, the maximum width for hedgerow removal is 15m for the Export Cable Corridor and 20m for the Onward Cable Route. For Concurrent and Sequential Scenarios, the anticipated maximum width for hedgerow removal is up to 24m for the Onshore Export Cable Corridor and up to 34m for the Onward Cable Route to the Proposed Birkhill Wood National Grid Substation. Where the crossing of a hedgerow can be limited to a Haul Road only, the maximum hedgerow removal width would be limited to 5m where the haul road crosses a field and a minimum of 6m where the haul road adjoins the public highway	DCO Requirement 12

Parameter	Embedded Mitigation Measures	Where Commitment is Secured
	However, where hedgerows intersect with construction access points off of existing roads, an average of 25m (12.5m from the centre point) of hedgerow will be removed for access and visibility splays, where possible this would be limited to pruning rather than full removal of a hedge. Hedgerows that intersect with TCCs will be removed where it is not possible to protect the hedgerow during the construction works. All affected hedgerows within the Onshore Development Area will be replanted and restored post construction. All mitigation measures in relation to hedgerows covering the different Construction Scenarios are provided in the **Outline Ecological Management Plan (Volume 8, application ref: 8.10).**	
Trees	Where possible trees within the Onshore Development Area will be retained. Trees identified to be retained will be fenced off and root protection zones established according to best practice and professional advice. Where this is not possible, any trees that require removal would be replanted in a suitable location within the Onshore Development Area, but not directly over the Onshore Export Cables. Tree surveys across the whole Onshore Development Area have been undertaken early in 2024 in accordance with the British Standard 5837:2012 Trees in Relation to Design, Demolition and Construction. An Arboricultural Impact Assessment (AIA) has also been produced and will be updated prior to construction to incorporate any changes to design if required. All mitigation measures in relation to trees are provided in the **Outline Ecological Management Plan (Volume 8, application ref: 8.10)**. The outline AIA was submitted into the Examination on the 8th November 2024 (Revision 2) and can be located in the examination document library as [AS-036] and [AS-037].	DCO Requirement 12
Roosting Bats	All affected trees will need be re-assessed for their suitability for roosting bats prior to construction start in line with the **Outline Ecological Management Plan (Volume 8, application ref: 8.10)**, as the potential roost features on trees are likely to change and new features can form overtime due to weather increments and natural processes, such as tree decay. Trees with bat roost potential will be subjected to further survey in accordance with best practice guidelines and, once completed, a roosting bat impact assessment can be finalised. Survey methods include, but are not limited to, endoscope inspections, aerial tree surveys (tree climbing or using mobile elevated working platforms (MEWPs)) by a bat licenced ecologist. Once trees have been assessed the combined impact on roosting, foraging, and commuting bats can be assessed. Where targeted surveys had found no evidence of roosting bats, trees with low bat roost potential (as classified in accordance with Bat Conservation Trust guidelines) would be soft-felled, as would any trees with High or Moderate bat roost potential. Tree survey methods include, but are not limited to, endoscope inspections, aerial tree surveys (tree climbing or using mobile elevated working platforms (MEWPs)) by a bat licenced ecologist.	DCO Requirement 12
Outline Landscape Management Plan (OLMP)	A Landscape Management Plan (LMP) will be developed in accordance with the **Outline Landscape Management Plan (Volume 8, application ref: 8.11).** The Landscape Management Plan will include details of mitigation planting at the Onshore Converter Station site, including the location, number, species and details of management and aftercare maintenance of new planting. Where practical, landscape mitigation planting will be established as early as reasonably practicable in the construction phase.	DCO Requirement 10
Vegetation Clearance	All vegetation requiring removal will be undertaken outside of the bird breeding season. If this is not reasonably practicable, the area of vegetation requiring removal will be subject to a nesting bird survey by a suitably qualified Ecological Clerk of Works (ECoW). If nesting birds are present, the vegetation will not be removed until the young have fledged or the nest failed. Further information is given in the **Outline Ecological Management Plan (Volume 8, application ref: 8.10)**	DCO Requirement 12

Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Badgers	Where required, provision will be made for badger access in relevant construction areas, when work is not taking place in order to ensure normal movements as far as reasonably possible. Provision will be made to ensure avoiding the entrapment of any animals within relevant construction areas. Checks will be made prior the start of any works to ensure no animals are trapped and if any have fallen in. Appropriate checks will be made as required by the EcoW. Further information is given in the **Outline Ecological Management Plan (Volume 8, application ref: 8.10).**	DCO Requirement 12
Otter and Water Voles	Prior to the commencement of construction activities, pre-construction otter and water volves surveys would be undertaken. All mitigation measures in relation to otters and water voles are provided in section 1.6.3.4.	DCO Requirement 12 and DCO Requirement 23
Ancient Woodland	In the instance of trees being within an area of ancient woodland, the Applicants are committed to using trenchless crossing techniques, such as HDD, at depths greater than 5 meters, as recommended by the Woodland Trust. If any constraints are identified during detailed geotechnical investigations, shallower depths will only be attempted if clear evidence is provided to demonstrate that this would not result in adverse impacts on roots, soils, or the rhizosphere along or above the proposed route.	DCO Requirement 12
Construction Lighting	Construction site lighting will only operate when required and will be positioned and directed to avoid unnecessary illumination to residential properties, sensitive ecological receptors, footpath users, and minimise glare to users of adjoining public highways. Construction site lighting will be designed in accordance with latest relevant available guidance and legislation and the details of the location, height, design, and luminance of lighting to be used will be detailed within the final Code of Construction Practice. The design of construction site lighting will accord with the details provided in the **Outline Code of Construction Practice (application ref: 8.9)** and **Outline Ecological Management Plan (application ref: 8.10)**.	DCO Requirement 19
Operational Lighting	Operational lighting at the Onshore Converter Stations would be designed in accordance with latest guidance and legislation. The details of the location, height, design and luminance of lighting to be used would be provided as part of detailed design for the Onshore Converter Stations. No permanent night-time lighting would be required. Security lighting will be installed as agreed in the written scheme for the management and mitigation of artificial light emissions during the operation.	DCO Requirement 22
Ponds	All ponds identified during the route planning and site selection process have been avoided where possible.	DCO Requirement 12
Reptiles	A competent person will undertake a search of all working areas identified as being suitable for reptiles. Any reptiles found within the working area will be relocated into suitable adjacent habitat. Habitat manipulation will be undertaken in order to discourage reptiles from the working area(s) with vegetation clearance cut in two stages under ECoW watching brief before each cutting stage. Further information is given in the **Outline Ecological Management Plan (Volume 8, application ref: 8.10)**	DCO Requirement 12
Pre-construction Surveys	Prior to the commencement of construction activities, pre-construction surveys will be undertaken by the ECoW where necessary, in accordance with the **Outline Ecological Management Plan (Volume 8, application ref: 8.10)** and latest available species-specific guidance.	DCO Requirement 12

Parameter	Embedded Mitigation Measures	Where Commitment is Secured
Decommissioning Plan	An Onshore Decommissioning Plan will be developed prior to decommissioning in a timely manner. The Onshore Decommissioning Plan will include provisions for the removal of all onshore above ground infrastructure and the decommissioning of below ground infrastructure and details relevant to flood risk, pollution prevention and avoidance of ground disturbance. The Onshore Decommissioning Plan will be drawn in line with the latest relevant available guidance and legislation.	DCO Requirement 27
Ecological Monitoring	Onshore ecological monitoring will be developed and agreed with stakeholders prior to construction, and are described in the **OEMP (Volume 8, application ref: 8.10)**.	DCO Requirement 12

18.4 Assessment Methodology

18.4.1 Policy, Legislation and Guidance

18.4.1.1 National Policy Statements

32. The assessment of potential impacts upon terrestrial ecology has been made with specific reference to the relevant National Policy Statements (NPS) including the Overarching NPS for Energy (EN-1), the NPS for Renewable Energy Infrastructure (EN-3) and the NPS for Electricity Networks Infrastructure (EN-5). These were published in November 2023 and were designated in January 2024. The specific assessment requirements for terrestrial ecology and ornithology, as detailed in the NPS, are summarised in **Table 18-5** together with an indication of the section of this chapter where each is addressed.

Table 18-5 NPS Assessment Requirements

NPS Requirement	NPS Reference	ES Section Reference
EN-1 NPS for Energy		
'Biodiversity net gain is an essential component of environmental net gain. Projects in England should consider and seek to incorporate improvements in natural capital, ecosystem services and the benefits they deliver when planning how to deliver biodiversity net gain.'	Paragraph 4.6.2	A summary is available in section 18.4.6.
'As a matter of policy, the following should be given the same protection as sites covered by the Habitats Regulations and an HRA will also be required: potential Special Protection Areas [SPAs] and possible Special Areas of Conservation [pSAC]; (b) listed or proposed Ramsar sites; and (c) sites identified, or required, as compensatory measures for adverse effects on any of the other sites covered by this paragraph.'	Paragraph 5.4.5	No pSPAs or pSACs are present within 10km of the Onshore Development Area. Statutory designated sites are discussed in section 18.5.2 with impacts discussed in section 18.6.
'Many SSSIs are also designated as sites of international importance and will be protected accordingly. Those that are not, or those features of SSSIs not covered by an	Paragraph 5.4.7	The Projects have avoided these sites through the route selection process.

NPS Requirement	NPS Reference	ES Section Reference
international designation, should be given a high degree of protection. Most National Nature Reserves [NNRs] are notified as SSSIs.'		Statutory designated sites are discussed in section 18.5.2 within impacts discussed in in section 18.6.
'Development on land within or outside a SSSI, 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 (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 5.4.8	The Projects have avoided these sites through the route selection process. Statutory designated sites are discussed in section 18.5.2 within impacts discussed in in section 18.6.
'National planning policy expects plans to identify and map Local Wildlife Sites [LWSs], and to include policies that not only secure their protection from harm or loss but also help to enhance them and their connection to wider ecological networks.'	Paragraph 5.4.13	The Projects have avoided these sites through the route selection process. Where avoidance is not possible, HDD and other trenchless techniques will be used to minimise the impact on LWS. Where this is not possible the LWS will be fully reinstated (Beeford-Dunnington Road Verge). Dust suppression and pollution prevention will be used where sites are adjacent to the Onshore Development Area. The Onshore Substation Zone has been designed to avoid direct impacts onto Bentley Moor Wood.

NPS Requirement	NPS Reference	ES Section Reference
		Non-statutory Designated Sites are discussed in section 18.5.2.
'Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Keepers of Time, the government's policy for ancient and native trees and woodlands in England sets out the government's commitment to maintain and enhance the existing area of ancient woodland, maintain and enhance the existing resource of known ancient and veteran trees, excluding natural losses from disease and death, and to increase the percentage of ancient woodland in active management. Ancient and veteran trees found outside ancient woodland are also particularly valuable. Other types of irreplaceable habitats include blanket bog, limestone pavement, coastal sand dunes, spartina salt marsh swards, mediterranean saltmarsh scrub, and lowland fen.'	Paragraph 5.4.15	The lowland fen habitat within the Onshore Development Area will be avoided using trenchless techniques Habitats are discussed in section 18.5.1 with impacts discussed in section 18.6.
'Many individual wildlife species receive statutory protection under a range of legislative provisions. Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in England and Wales, as well as for their continued benefit for climate mitigation and adaptation and thereby requiring conservation action.'	Paragraph 5.4.16	Where possible these habitats and species will be avoided, where an impact is expected mitigation techniques will be implemented. Protected habitats are discussed within 18.5.1 Protected and notable species are discussed in section 18.5.4. Mitigation measures are discussed in section 18.6.
'Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally,	Paragraph 5.4.17	Impacts on designated sites, habitats and species

NPS Requirement	NPS Reference	ES Section Reference
nationally, and locally designated sites of ecological or geological conservation importance (including those outside England), on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats.'		are all discussed in section 18.6. **Report to Inform Appropriate Assessment Habitat Regulations Assessment (Volume 6, application ref: 6.1)** details the assessment undertaken regarding potential adverse effects on site integrity of the Humber Estuary SAC/ SPA. Natural England have agreed that there is no impact on potential Functionally Linked Land associated with the SPA within the Onshore Development Area. However, the SAC has been screened in and assessed because of potential changes to air quality linked to construction traffic. Where possible habitats and species of principal importance will be avoided, where an impact is expected mitigation measures will be implemented. Protected habitats are discussed within section 18.5.1 Protected and notable species are discussed in section 18.5.4. Mitigation measures are discussed in section 18.6.

NPS Requirement	NPS Reference	ES Section Reference
'Applicants should consider any reasonable opportunities to maximise the restoration, creation, and enhancement of wider biodiversity, and the protection and restoration of the ability of habitats to store or sequester carbon as set out under Section 4.6.'	Paragraph 5.4.33	All habitats, including hedgerows will be re-instated where loss is only temporary, as outlined in section 18.6.1.
'Consideration should be given to improvements to, and impacts on, habitats and species in, around and beyond developments, for wider ecosystem services and natural capital benefits, beyond those under protection and identified as being of principal importance. This may include considerations and opportunities identified through Local Nature Recovery Strategies, and national goals and targets set through the Environment Act 2021 and the Environmental Improvement Plan 2023.	Paragraph 5.4.34	A summary of Biodiversity Net Gain (BNG) is available in Section 18.4.6. With the full Biodiversity Net Gain Strategy report available in **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10).** No further enhancements are proposed at this stage.
'Applicants should include appropriate avoidance, mitigation, compensation, and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that: • during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works • the timing of construction has been planned to avoid or limit disturbance • during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements • habitats will, where practicable, be restored after construction works have finished • opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site	Paragraph 5.4.35	Avoidance and mitigation relating to these areas during construction is outlined in section 18.6 for each species and habitat.

NPS Requirement	NPS Reference	ES Section Reference
landscaping proposals. Where habitat creation is required as mitigation, compensation, or enhancement the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised. • mitigations required as a result of legal protection of habitats or species will be complied with.'		
'Applicants should produce and implement a Biodiversity Management Strategy as part of their development proposals. This could include provision for biodiversity awareness training to employees and contractors so as to avoid unnecessary adverse impacts on biodiversity during the construction and operation stages.'	Paragraph 5.4.36	Toolbox talks will be provided to all site staff by a suitability qualified ECoW for all relevant species and habitat as outlined in section 18.6.
EN-3 NPS for Renewable Energy Infrastructure		
'Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/co-location with other marine uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage.'	Paragraph 2.5.2	Project design has avoided sensitive features where possible. Embedded mitigation measures are presented in section 18.3.4 and where applicable, further mitigation measures are outlined in section 18.6.
'Applicants should set out what would be decommissioned and removed from the site at the end of the operational life of the generating station, considering instances where it may be less harmful for the ecology of the site to keep or retain certain types of infrastructure, for example underground cabling, and where there may be socio-economic benefits in retaining site infrastructure after the operational life, such	Paragraph 2.10.69	Decommissioning impacts are expected to be similar in nature to those during construction but of a smaller magnitude. The same receptors will be scoped in and out of the assessment. As outlined in section 18.6.3.

NPS Requirement	NPS Reference	ES Section Reference
as retaining pathways through the site or a site substation.'		
'The applicant's ecological assessments should identify any ecological risk from developing on the proposed site.'	Paragraph 2.10.76	All risks to developing on the site are discussed in section 18.6.
'Issues that need assessment may include habitats, ground nesting birds, wintering and migratory birds, bats, dormice, reptiles, great crested newts, water voles and badgers.'	Paragraph 2.10.77	The existing environment results for habitats and species are available in 18.5.1. A full impact assessment for the relevant receptors are available in section 18.6.1. Species scoped out and reasoning are available in section 18.3.
'The assessment may be informed by a 'desk study' of existing ecological records, an evaluation of the likely impacts of the solar farm upon ecological features and should specify mitigation to avoid or minimise these impacts, and any further surveys required.'	Paragraph 2.10.79	A desk study was carried out using data collected from the North and East Yorkshire Ecological Data Centre NEYEDC. The results are available where relevant throughout section 18.6. Results are also presented in relevant survey report appendices.
'Applicants should consider how security and lighting installations may impact on the local ecology. Where pole mounted CCTV facilities are proposed the location of these facilities should be carefully considered to minimise impact. If lighting is necessary, it should be minimised and directed away from areas of likely habitat.'	Paragraph 2.10.82	Security lighting will be required during the construction and operational phase of the Projects. Lighting will be minimised and will be directional towards the working areas to prevent light spill onto adjacent habitats and species utilising the surrounding

NPS Requirement	NPS Reference	ES Section Reference
		areas. As outlined in section 18.6.
'Applicants should consider how site boundaries are managed. If any hedges/scrub are to be removed, further surveys may be necessary to account for impacts. Buffer strips between perimeter fencing and hedges may be proposed, and the construction and design of any fencing should account for enabling mammal, reptile and other fauna access into the site if required to do so in the ecological report.'	Paragraph 2.10.83	Full hedgerow assessments have been undertaken as part of the habitat surveys. Impacts on the hedgerows are discussed in Section 18.6.
'Culverting existing watercourses/drainage ditches should be avoided.'	Paragraph 2.10.87	The use of culverts will only be used where there are no other techniques available. These areas are identified in section 18.3.
'For projects in England, applicants should consider enhancement, management, and monitoring of biodiversity in line with the ambition set out in the Environmental Improvement Plan and any relevant measures and targets, including statutory targets set under the Environment Act or elsewhere.'	Paragraph 2.10.90	The monitoring of bat and bird boxes, the re-instatement of hedgerows, INNS populations are discussed in section 18.7. If EPS licences are required, any mitigation would be outlined within the licence and overwrite the ES chapter recommendations.
'Applicants are advised to develop an ecological monitoring programme to monitor impacts during the pre-construction, construction and operational phases to identify the actual impacts caused by the project and compare them to what was predicted in the EIA/HRA.'	Paragraph 2.8.221	Monitoring requirements, including potential recommendations in case wildlife licences are needed are set out in section 18.7.
'Applicants are advised to develop an ecological monitoring programme to monitor impacts upon the flora of the site	Paragraph 2.10.130	Monitoring requirements, including potential recommendations in case

NPS Requirement	NPS Reference	ES Section Reference
and upon any particular ecological receptors (such as bats and wintering birds). Results of the monitoring will then inform any changes needed to the land management of the site, including, if appropriate, any livestock grazing regime.'		wildlife licences are needed are set out in section 18.7.
'The applicant's ecological assessments should identify any ecological risk from developing on the proposed site.'	Paragraph 2.10.76	Ecological risk to all habitats and species is discussed in section 18.6 (other than species scoped out in section 18.3).
EN-5 NPS for Electricity Networks Infrastructure		
'When planning and evaluating the proposed development's contribution to environmental and biodiversity net gain, it will be important – for both the applicant and the Secretary of State – to supplement the generic guidance set out in EN-1 (Section 4.5) with recognition that the linear nature of electricity networks infrastructure can allow for excellent opportunities to: i. reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or ii. connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements.'	Paragraph 2.5.1	A summary is available in section 18.4.6.

18.4.1.2 Other

33. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of terrestrial ecology and ornithology. These include:

18.4.1.2.1 Biodiversity Policy

34. The overarching policy guidance for terrestrial ecology and ornithology for NSIPs is included in the NPS but the National Planning Policy Framework (NPPF)may also be considered relevant. Section 15 of the NPPF (Conserving and Enhancing the Natural Environment) outlines the approach that Local Authorities should adopt when considering ecological issues within the planning framework, including the principles of the Mitigation Hierarchy. This states that in addressing impacts on valued features, avoidance should be the first option considered, followed by mitigation (minimising negative impacts). Where avoidance and mitigation are not possible, compensation for loss of features can be used as a last resort.

35. The NPPF states that "*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*".

36. The NPPF also states that development plans should *"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*", and "*...opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity*." The Applicants' approach to Biodiversity Net Gain (BNG) is discussed in section 18.4.6.

18.4.1.2.2 International Site Designations

37. The European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92 / 43 / EEC) (the Habitats Directive) directs the designation of important wildlife sites through the EU as Special Areas of Conservation (SACs) and gives statutory protection to habitats and species listed in the Directive as being threatened or of community interest. Sites identified as candidate SAC (cSAC) are provided with the same level of protection as SAC.

38. Annex I of the Habitats Directive lists habitat types which are regarded as being of European importance. Included within these are several 'priority habitat types' which are habitats regarded as being in danger of disappearance and whose natural range falls broadly within the EU. This European law was originally transposed into English and Welsh legislation by The Conservation (Natural Habitats & c.) Regulations 1994, later replaced by Conservation of Habitats and Species Regulations 2017.

39. Changes to the Conservation of Habitats and Species Regulations 2017 have been implemented by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The key changes are the creation of a 'National Site Network' (NSN) (which no longer forms part of the EU Natura 2000 network) and the establishment of management objectives for the NSN. The network objectives are to:

- Maintain or, where appropriate, restore habitats and species listed in Annexes I and II of the Habitats Directive to a favourable conservation status; and
- Contribute to ensuring, in their area of distribution, the survival and reproduction of wild birds and securing compliance with the overarching aims of the Wild Birds Directive (Directive 2009 / 147 / EC).

40. Habitats of European-wide importance for birds are listed under the Wild Birds Directive (Directive 2009 / 147 / ED). Habitats designated under this Directive are notified as Special Protected Areas (SPA) and are identified for holding populations >1% of the reference population as defined in Appendix 4 of the SPA review of bird species listed in Annex 1 of the same Council Directive. Sites identified as potential SPA (pSPA) are provided with the same level of protection as SPA.

41. Wetlands of international importance (especially as waterfowl habitat) are designated under the Ramsar Convention, an intergovernmental treaty adopted in 1971 which provides a framework for '*the conservation and wise use of wetlands and their resources*.'

18.4.1.2.3 National (UK) Site Designations

42. National ecological designations, such as Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR) are also afforded statutory protection. SSSIs are notified and protected under the jurisdiction of the Wildlife and Countryside Act 1981 (WCA). SSSIs are notified based on specific criteria, including the general condition and rarity of the site and of the species or habitats supported by it.

18.4.1.2.4 Non-Statutory (County) Site Designations

43. Local authorities may designate certain areas as being of local conservation interest. The criteria for inclusion may vary between areas. Most individual counties have a similar scheme; within the East Riding of Yorkshire such sites are designated as (LWSs or LNRs). Designation of such sites does not itself confer statutory protection.

18.4.1.2.5 Relevant Species Designation and Protection

44. The Protection of Badgers Act 1992 makes it unlawful to knowingly kill, capture, disturb or injure an individual badger or to intentionally damage, destroy or obstruct an area used for breeding, resting, or sheltering by badgers (i.e. a sett).

45. All bat species are listed under Annex IV (and certain species also under Annex II) of the Habitats Directive and are given UK protected status by Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Bats and their roosts also receive protection from disturbance through the WCA. This protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

46. All bird species are protected under the WCA. This prevents killing or injuring any bird or damaging or destroying nests and eggs. Certain species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the WCA, which prohibits intentionally or recklessly disturbing the species at, on or near an '*active*' nest.

47. All native reptiles are listed on Schedule 5 of the WCA and are afforded protection under Sections 9(1) and 9(5). For the reptile species adder *Vipera berus*, grass snake *Natrix helvetica* (previously *Natrix natrix)*, slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara*, this protection prohibits deliberate or reckless killing and injury but does not include habitat protection.

48. GCN are fully protected in accordance with both national and international legislation. The species is listed under Annexes IV and II of the Habitats Directive, and Schedule 2 of The Conservation of Habitats and Species Regulations 2017. The species is also protected by Sections 9(4) and 9(5) of the WCA. It is an offence to knowingly or recklessly kill, injure, disturb, handle or sell the animal, and this protection is afforded to all life stages. It is unlawful to deliberately or recklessly damage, destroy, or obstruct the access to any structure or place used for shelter or protection; this includes both the terrestrial and aquatic components of its habitat.

49. Otters are protected in accordance with Schedule 5 of the WCA. The otter is also a protected species included in Annex II of the Habitats Directive and is protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. It is an offence to intentionally kill, injure or take an otter from the wild, or to intentionally or recklessly damage, destroy or obstruct access to any habitat used by otters or to disturb the otters which make use of those habitats.

50. The water vole *Arvicola amphibius* is protected in accordance with Schedule 5 of the WCA. It is an offence to intentionally damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection, or to disturb water voles whilst they are using such a place. It is also an offence to kill, injure, capture, or possess water voles.

51. Schedule 8 of the of the WCA lists plant species which are afforded special protection. It is an offence to pick, uproot or destroy any species listed on Schedule 8 without prior authorisation, and all plants are protected from unauthorised uprooting (i.e. without the landowner's permission) under section 13 of the WCA.

52. A Vascular Plant Red List for England provides a measure of the current state of England's flora measured against standardised International Union for Conservation of Nature criteria. Any taxon that is threatened (Critically Endangered, Endangered, Vulnerable) or Near Threatened) does not have statutory protection but should be regarded as a priority for conservation in England. It should be noted that 'threat' is not synonymous with 'rarity'; some of the species concerned are relatively common and widespread.

18.4.1.2.6 Priority Species and Habitats

53. Species and Habitats of Principal Importance (hereafter referred to as "priority habitats" and "priority species") are a consideration under the NPPF, placing responsibility on Local Planning Authorities to aim to conserve and enhance biodiversity and to encourage biodiversity in and around developments. There is a general biodiversity duty in the Natural Environment and Rural Communities Act 2006 (NERC Act) (Section 40). Biodiversity, as covered by the Section 40 duty, includes all biodiversity, not just priority habitats and species.

54. Section 41 of the NERC Act places a duty on the Secretary of State to publish lists of priority species and habitats. These are species / habitats in England which had been identified as requiring action under the UK Biodiversity Action Plan (BAP), and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework (Joint Nature Conservation Committee (JNCC), 2012). The protection of either priority species or habitats is not statutory, but "*specific consideration*" should be afforded by Local Planning Authorities when dealing with them in relation to planning and development control. Also, there is an expectation that public bodies would refer to the Section 41 list when complying with the Section 40 duty.

55. Widespread priority habitats in East Riding of Yorkshire include, but are not limited to:

- Coastal and floodplain grazing marsh;
- Lowland mixed deciduous woodland;
- Maritime cliffs and slopes; and
- Traditional orchard.

56. Widespread priority species in East Riding of Yorkshire (which have no specific legal protection) include:

- West European hedgehog *Erinaceus europaeus*;
- Polecat Mustela putorius;
- Brown hare Lepus europaeus;
- Harvest mouse Micromys minutus;
- Multiple Birds of Conservation Concern (BoCC) (e.g. song thrush *Turdus philomelos* and house sparrow *Passer domesticus*);
- Common toad *Bufo bufo*;
- European eel Anguilla anguilla;
- Multiple invertebrate species; and
- Multiple plant species.

57. This is not a complete list and relies on the submission of records to record centres, so there will be other widespread priority species present in the East Riding of Yorkshire that are not listed and/ or recorded.

18.4.1.2.7 The Hedgerow Regulations

58. The Hedgerow Regulations 1997 make it an offence to remove or destroy certain hedgerows without permission from the local planning authority and the local planning authority is the enforcement body for such offences.

18.4.1.3 Local Planning Policy

59. In addition to the national and international policy, this chapter also takes into consideration the following local policies:

- The East Riding of Yorkshire Local Plan 2012- 2029 Strategy Document (Adopted April 2016) (East Riding of Yorkshire Council, 2016)
- East Riding of Yorkshire Local Plan Update 2020 – 2039 Strategy Document (Proposed Submission Strategy Document Update – October 2022) (East Riding of Yorkshire Council, 2023); and
- East Riding of Yorkshire Biodiversity Action Plan Strategy (East Riding of Yorkshire Council, 2010).

18.4.1.4 Guidance

60. The impact assessment has been based upon the following guidance and standards:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (CIEEM, 2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal;
- Construction Industry Research and Information Association (CIRIA) C648 (2006) Control of water pollution from linear construction projects (CIRIA, 2006); and
- CIRIA Guidance note C692 Environmental Good Practice on Site Guide (3rd Edition – CIRIA, 2010).

61. The following species-specific guidance and standards have been used during the assessment process:

- Standing advice on protected species (bats (all species), GCN, badger, water vole, otter, reptiles, protected plants, invertebrates, ancient woodlands and veteran trees) (Natural England, 2015);
- British Standard 5837: 2012 – Trees in relation to design, demolition and construction;
- Bat Conservation Trust and Institute of Lighting Engineers (2023) Bats and Artificial Lighting at night (ILE, 2023);
- Bats: UK Bat Mitigation guidelines (Reason and Wray, 2023);
- Bat Surveys for Professional Ecologists (Collins, 2023);
- The Water Vole Mitigation Handbook (The Mammal Society Guidance Series) (Dean *et al.*, 2016);
- Reptile Habitat Management Handbook (Edgar *et al.*, 2010);

- Great Crested Newt Mitigation Guidelines (English Nature, 2001);
- Herpetofauna Worker's Manual (JNCC, 2003);
- Otters: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2014);
- Badgers: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Badger Protection: Best practice guidance for developers, ecologists and planners (England) (Badger Trust, 2023);
- Bats: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Great crested newts: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Invertebrates: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Reptiles: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Water voles: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Water Vole Conservation Handbook, 3rd Edition (Strachan and Moorhouse, 2011); and
- Great Britain (GB) Non-native Species Information (GB Non-native secretariat, 2015).

62. Further detail is provided in **Volume 7, Chapter 3 Policy and Legislative Context (application ref: 7.3)**.

18.4.2 Data and Information Sources

18.4.2.1 Site Specific Surveys

63. In order to provide site specific and up to date information on which to base the impact assessment, habitat, badger, bat ground level tree assessment, bat activity, GCN, overwintering bird, breeding bird, and riparian mammal surveys have been undertaken.

64. Full survey methodologies and results are presented in their respective technical appendices (**Volume 7, Appendix 18-2 – 18-9 (application ref: 7.18.18.2-7.18.18.9)**), that support this chapter.

65. All ecological surveys that have been undertaken in relation to the Projects are summarised in **Table 18-6**.

Table 18-6 Summary of Ecological Surveys Undertaken for the Projects

Title, year and reference	Scope	Coverage of the Projects	Survey Status
Habitat survey 2022 plus various dates between May and August 2023. **Volume 7, Appendix 18-2, (application ref: 7.18.18.2)**	An UKHab survey was completed according to the UK Habitat Classification Version 1.1 (UKHab) survey methodology and guidance (Butcher *et al*, 2020). BNG assessment was carried out on every relevant habitat using Biodiversity Metric 4.0 Technical Annexe 1. Hedgerows were assessed according to criteria described under the Hedgerow Regulations 1997, legislation.	All areas within the Onshore Development Area other than inaccessible road verges.	Complete
GCN eDNA survey April to September 2023 (HSI) April to June 2023 (eDNA) **Volume 7, Appendix 18-3, (application ref: 7.18.18.3)**	A GCN environmental DNA (eDNA) survey of ponds. A Habitat Suitability Index (HSI) assessment protocol (Oldham et al. 2000).	All areas within the Onshore Development Area plus a 250m buffer. Plus ponds outside of 250m where there was good terrestrial connectivity with the Onshore Development Area and/or groups of ponds which could support GCN metapopulations.	Complete - where accessible, where ponds were not dry, and where landowner permission was granted.

Title, year and reference	Scope	Coverage of the Projects	Survey Status
Badger survey May to August 2023 **Volume 7, Appendix 18-4, (application ref: 7.18.18.4)**	A badger presence/absence survey, identifying field signs including: the identification of setts, evidence of bedding, badger paths/runways between setts; latrines; footprints, and confirmed badger hairs caught on vegetation or fencing; snuffle holes; signs of possible feeding; playing areas; and scratching posts.	Onshore Development Area plus a 30m minimum buffer.	Complete. Pre-construction surveys would be required.
Bats (Ground Level Tree Assessment) February to September 2023 **Volume 7, Appendix 18-5, (application ref: 7.18.18.5)**	Trees were surveyed to identify any suitability to support roosting bats. All trees were assessed, however, trees with a DBH (diameter at breast height) value of less than 20cm were not recorded. Various data were recorded, including; location, species, height, age, condition and bat roost potential.	Onshore Development Area	Complete. Pre-construction surveys would be required.
Bats (monthly activity transects) April to October 2023 **Volume 7, Appendix 18-6, (application ref: 7.18.18.6)**	Each transect route was surveyed once a month from April to October inclusive. Static bat monitoring devices were deployed for a minimum of five nights per month, with one device deployed per transect route at a designated location.	Onshore Development Area	Complete.

Title, year and reference	Scope	Coverage of the Projects	Survey Status
Ornithology overwintering bird survey October 2022 to March 2023 **Volume 7, Appendix 18-7, (application ref: 7.18.18.7)**	A suite of monthly transect surveys were carried out to determine the presence and utilisation of over-wintering birds.	Eight transects, based on key habitat areas in order to be representative of the whole Onshore Development Area.	Complete Pre-construction surveys may be required.
Ornithology breeding bird survey March 2023 to July 2023 **Volume 7, Appendix 18-8, (application ref: 7.18.18.8)**	A suite of monthly transect surveys were carried out to determine the presence and utilisation of breeding birds, designed to follow on from the over-wintering bird survey.	Eight transects, based on key habitat areas in order to be representative of the whole Onshore Development Area.	Complete. Pre-construction surveys may be required.
Riparian mammal survey April to September 2023 **Volume 7, Appendix 18-9, (application ref: 7.18.18.9)**	A presence/absence survey of watercourses identified as suitable to support water voles. Otter and water vole surveys were undertaken concurrently.	All suitable watercourses (81) within the Onshore Development Area and a 50m buffer.	Complete. Pre-construction surveys would be required.

18.4.2.2 Other Available Sources

66. Other sources that have been used to inform the assessment are listed in **Table 18-7**.

Table 18-7 Other Available Data and Information Sources

Data Set	Spatial Coverage	Year
Desk study report	Onshore Development Area plus a 2km buffer	2022
Environmental Impact Assessment Scoping Report	Onshore Development Area plus a 2km buffer	2022
Scoping Opinion: Proposed Dogger Bank South Offshore Wind Farms	Onshore Development Area plus a 2km buffer	2022
Biological records data from NEYEDC	Onshore Development Area	2022
MAGIC	Onshore Development Area plus 10km buffer	2023
OS data	Onshore Development Area plus 250m	2023

18.4.3 Impact Assessment Methodology

67. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** provides a summary of the general impact assessment methodology applied. The following sections describe the methods used to assess the likely significant effects on terrestrial ecology and ornithology.

68. The ES methodology proposed in relation to Terrestrial Ecology and Ornithology is based on the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM 2018). These guidelines aim to predict the residual impacts on important ecological features affected, either directly or indirectly by a development, once all the appropriate mitigation has been implemented.

69. The approach to determining the significance of an impact follows a systematic process for all impacts. This involves identifying, qualifying and, where possible, quantifying the sensitivity and value of all ecological receptors and magnitude of effects which have been scoped into this assessment. Using this information, the significance of each potential impact has been determined. Each of these definitions is set out in the remainder of this section.

70. The ES has used professional judgement to ensure the assessed significance level is appropriate for each individual receptor, taking account of local values for biodiversity to avoid a subjective assessment wherever possible as per the CIEEM guidelines. As a result, the assessed significance level may not always be directly attributed to the guidance matrix detailed below.

18.4.3.1 Definitions

71. For each potential impact, the assessment identifies receptors sensitive to that impact and implements a systematic approach to understanding the impact pathways and the level of impacts (i.e. magnitude) on given receptors. The definitions of duration, importance, sensitivity and magnitude for the purpose of the terrestrial ecology and ornithology assessments are provided in **Table 18-8**, **Table 18-9**, **Table 18-10** and **Table 18-11**.

Table 18-8 Definition of Duration for a Terrestrial Ecology Receptor

Duration	Definition
Short term	Effects which at most occur over a part of – or over a part of a key period of – a species' active season or a habitat's growing season, i.e. typically impacts which occur over a matter of days or weeks.
Medium term	Effects which at most occur over a part of – or over a part of a key period of – a species' active season or a habitat's growing season, i.e. typically impacts which occur over a matter of months or one year.
Long term	Effects which occur over the multiple active or growing seasons, i.e. typically impacts which occur over more than one year.

Table 18-9 Definition of Importance for a Terrestrial Ecology Receptor

Importance	Definition
Very High	Habitats or species that form part of the cited interest within an internationally or nationally protected site, such as those designated under the Habitats Directive (e.g. SACs) or other international convention (e.g. Ramsar site). A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in an international/ national context, such that the site is likely to be designated as a site of European importance (e.g. SAC or SPA).
High	Habitats or species that form part of the cited interest within a nationally designated site, such as a SSSI or an NNR. A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in a national context for which the site could potentially be designated as a SSSI. Presence of United Kingdom Biodiversity Action Plan (UKBAP) habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
Medium	A feature (e.g. habitat or population), which is either unique or sufficiently unusual to be considered as being of nature conservation value from a county to regional level. Habitats or species that form part of the cited interest of an LNR, or some local-level designated sites, such as a Local Wildlife Sites (LWS), also referred to as a non-statutory Site of Importance for Nature Conservation or the equivalent, e.g. Ancient Woodland designation. Presence of Local Biodiversity Action Plan (LBAP) habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
Low	A feature of importance at district level. A feature (e.g. habitat or population) that is of nature conservation value in a local context only, with insufficient value to merit a formal nature conservation designation.
Negligible	A feature of importance at local level. Commonplace feature of little or no habitat / historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.

Table 18-10 Definition of Sensitivity for a Terrestrial Ecology Receptor

Sensitivity	Definition
High	The receptor is unable to tolerate effect resulting in permanent change in its abundance or quality. Receptor is unable to avoid impact and therefore unable to recover resulting in permanent or long-terms change (i.e. ten years or more).
Medium	The receptor has some ability to tolerate this effect but does experience a detectable change. Receptor has some ability to avoid the most negative consequence of the impact and / or can partially adapt and therefore is able to recover to an acceptable status over the short to medium term (one to ten).
Low	The receptor is unaffected and therefore the receptor can completely avoid the impact or adapt to it with no detectable change. Consequently, the receptor can recover fully within the short term (one year).

Table 18-11 Definition of Magnitude of Impacts

Magnitude	Definition
High	The impact is likely to have an adverse effect on the integrity of a site or the conservation status of a species or species assemblage.
Medium	The impact adversely affects an ecological receptor but is unlikely to adversely affect its integrity or conservation status.
Low	The impact adversely affects an ecological receptor but would not adversely affect its integrity or conservation status.
Negligible	There would be minimal effect on the ecological receptor.
No change	There would be no detectable change from the baseline condition of the ecological receptor.

18.4.3.2 Significance of Effect

72. The assessment of significance of an effect is informed by the sensitivity of the receptor and the magnitude of the impact. The determination of significance is guided by the use of an impact significance matrix presented in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)**. Definitions of each level of significance are provided in **Table 18-13**. For the purposes of this assessment, any effect that is of major or moderate significance is considered to be significant in EIA terms, whether this be adverse or beneficial. Any effect that has a significance of minor or negligible is not significant.

Table 18-12 Terrestrial Ecology Significance of Effect Matrix

		Adverse Magnitude				Beneficial Magnitude			
		High	**Medium**	**Low**	**Negligible**	**Negligible**	**Low**	**Medium**	**High**
Sensitivity	High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 18-13 Definition of Effect Significance

Significance	Definition
Major	Very large or large change in receptor condition, which is likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or could result in exceedance of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in receptor condition, which is likely to be important considerations at a local level.
Minor	Small change in receptor condition, which may be raised as local issues but are unlikely to be important in the decision-making process.
Negligible	No discernible change in receptor condition.
No change	No impact, therefore, no change in receptor condition.

18.4.4 Cumulative Effect Assessment Methodology

73. The cumulative effect assessment (CEA) considers other schemes, plans, projects and activities that may result in significant effects in cumulation with the Projects. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** (and accompanying **Volume 7, Appendix 6-1 Onshore Cumulative Assessment (application ref: 7.6.6.1**)) provides further details of the general framework and approach to the CEA.

18.4.5 Assumptions and Limitations

18.4.5.1 Desk Study

74. As with most desk studies, data obtained from local environmental records centre such as the NEYEDC, is generated from many sources and quality and accuracy cannot be guaranteed. This is not a definitive data set and a lack of data in any area does not necessarily denote an absence of species or habitats. Records tend to be concentrated around residential areas, wildlife sites and popular visitor locations (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2).** However, the information obtained is sufficient to undertake the assessment (based on worst case scenario) and method of obtaining data is industry standard as well as normal practice for EIAs.

18.4.5.2 Habitat Surveys

75. For the habitat survey all areas within the Onshore Development Area could be accessed to allow a thorough survey, with the exception of some sections of road verges. These areas are mapped as "No Access - verge" (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**).

18.4.5.3 Great Crested Newts

76. The HSI looks at the potential of the pond for GCN colonisation, it is only a tool used in conjunction with other more substantial methodologies including standard survey methods and eDNA sampling (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**).

77. Ponds that were no longer functioning as ponds, or where there was no evidence of a pond having existed, have been listed as "Not a pond" in the results table. Ponds found to have dried up but retaining visible evidence of having previously been a pond, have been listed as "Dry" and GCN considered absent (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**).

78. One pond was only identified in August 2023 and HSI assessed in September, while three more ponds were subject to restricted access due to the presence of Schedule 1 listed marsh harrier's nesting nearby and were only able to be accessed and surveyed in August. Apart from these exceptions, all surveys were undertaken within the appropriate GCN survey window, from Mid-April to the end of June, under suitable weather conditions (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**).

79. During the eDNA surveys for GCN, 57 ponds had neither eDNA or Habitat Suitability Index (HIS) undertaken. However, this is not considered a significant limitation for District Level Licencing (DLL) purposes because most of the ponds that could not be surveyed were due to the ponds being dry, non-existent or stocked for fishing; whereas only a small proportion were due to access limitations.

18.4.5.4 Badgers

80. Most of the badger surveys were undertaken under optimum conditions early in the season, when vegetation growth was relatively minimal to facilitate visual inspections and less likely to restrict surveyor's access. Even for areas surveyed later in the season, given that the majority of the habitat is agricultural land, appropriate survey methods could be applied with no limitations (**Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4**)).

18.4.5.5 Bats

81. All trees within and around the Onshore Development Area were assessed for their suitability for roosting bats from all sides, any features were noted and used to formulate the overall suitability of each tree. It is possible that some features could not be seen from ground level and not taken into consideration (**Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**).

82. Trees that were surveyed during the growing season may have been in part or in full leaf and this can obscure features and make it more difficult to see potential roost sites (**Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**).

83. Some woodlands were very dense and could not be fully accessed; in these cases, peripheral trees were assessed and other open areas such as woodland rides, where surveyors could access. Consequently, it is possible that some trees with bat roost potential in dense woodland were not assessed (**Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**).

84. The Bat Conservation Trust (BCT) good practice guidelines (Collins (ed), 2016) state that the minimum temperature at sunset for surveys to be undertaken is 10°C. The survey visits in April 2023 were conducted over a three-week period, and the temperature at sunset was below this minimum threshold for all transects. The temperatures throughout the month of April were considered to be low, and therefore it was considered more beneficial to the overall survey effort to collect data in sub-optimal conditions than to not collect data at all in April. The other weather parameters including precipitation and wind speed were favourable for all April survey visits (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

85. Transect T7 underwent a route change between the April and May 2023 survey visits, as it was found not to be possible to cross a railway line. This route change is presented in Appendix D visits (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

86. A short section of Transect T1 was not completed from June 2023 onwards due to dense overgrown vegetation which was impassable. On a number of occasions, a short diversion was made on Transect T9 to avoid a field containing several horses. The diversion skirted the edge of the field rather than passing through it visits (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

87. Transect T2 and Transect T3 were subject to access restrictions from the landowners for the September and October 2023 survey visits. The transect routes were diverted to avoid restricted land and made attempt to survey as much of the original route as possible. These route changes are presented in Appendix D of visits (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

88. Peak Ecology Ltd purchased new bat detectors in order to undertake all the surveys ensuring that the methodology used the same, most up-to-date equipment and analysis software. Unfortunately, some unexpected technical faults were experienced with the detectors during the 2023 survey season such as malfunctioning GPS connections leading to data on transects not being attributed to the correct geographical point, or faulty battery connections leading to detectors recording intermittently. A summary of these faults is presented in Table 3 of the **Volume 7, Appendix 18-6 Bats Report -Monthly Activity Transects (application ref: 7.18.18.6**)). During the transect surveys, surveyors were equipped with a hand-held heterodyne bat detector and recorded bats seen and heard on paper survey maps, which acted as a suitable back-up in case of any fault with the recording device or the GPS tagging of calls. Where static detectors were found to have malfunctioned, these were redeployed where possible visits. It has been considered that the equipment's technical faults haven't compromised the integrity of the results because of the availability of backup equipment, or redeployment in case of static bat detectors, and the comprehensive dataset obtained from the field surveys through the seasons (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

18.4.5.6 Breeding Birds

89. The surveys were undertaken by a linear transect route which followed the Onshore Development Area, rather than a more detailed transect route which would reflect current guidelines, because of the relatively large area of the study area. Whilst it is possible that the survey methodology has resulted in an underestimate of the bird assemblage present, it still allows for an indication of the importance of the bird assemblages to be estimated based on total number of species and the number/ proportion of birds with conservation status present **(Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

18.4.5.7 Overwintering birds

90. Access for some transects was delayed and therefore a full six-visit survey was not possible for all transects. T5, T7 and T8 were subject to six visits; T2 five visits; T1 four visits and T3, T4 and T6 were visited three times each. The reduced survey windows, particularly for Transects 3, 4 and 6 and the consequent reduced amounts of data may have potentially resulted in species being unrecorded. The surveys were undertaken by a linear transect route which followed the Onshore Development Area, rather than a more detailed transect route which would reflect current guidelines, because of the relatively large study area. Whilst it is possible that the survey methodology has resulted in an underestimate of the bird assemblage present, it still allows for an indication of the importance of the bird assemblages to be estimated based on total number of species and the number/proportion of birds with conservation status present.

91. Similarly, standard methods for evaluating the importance of bird assemblages relate to a specific site, but in this case were adapted to linear transects routes, which in turn, may lead to a misrepresentation of the area's bird assemblage's diversity. Nonetheless, a robust dataset was gathered and the Fuller (1980) assessment method provided and indication of the value of an assemblage. In some cases, comparisons to designated site selection criteria provide useful assessment tools **(Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

18.4.5.8 Riparian Mammals

92. All riparian mammal surveys were conducted under suitable weather conditions avoiding heavy rain and avoiding surveys for at least five days after heavy rain which can wash water vole and otter signs away. The conditions on the first visit to Stream Dike were considered unsuitable due to the high level of the water up the bank covering up any potential burrow entrances and washing away any possible evidence. Therefore, an extra, standard survey visit was conducted on this ditch under optimal conditions.

93. Due to the nature of many of the watercourses, access to the banks to conduct a thorough search of water vole and otter field signs was limited due to dense swathes of heavy vegetation. Additionally, in some cases large sections of the channel were also inaccessible. Furthermore, due to the possible presence of breeding birds in many of these habitats it was not always possible to access the banks without causing disturbance and potentially damage to active bird nests. It is possible that, due to very dense vegetation restricting access, water vole and otter signs may have been missed. To mitigate this, where no water vole evidence was found and habitat was considered optimal or good, or if the watercourse was connected to a known colony of water voles, an additional methodology involving floating rafts was employed to increase the chance of water vole colonies being detected in these challenging habitats (see section 2.2 of **Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**).

94. In some instances, rafts appeared to have been moved out of their original positions either intentionally, such as by a landowner or member of the public, or inadvertently as a result of ditch management practices or falling water levels. Just three ditches had significant numbers of rafts found in unsuitable locations (5, 62 and Stream Dike). Due to the significant drop in water level in Ditches 5 and 62 this was not considered a significant limitation to the survey, as both were subjected to a second standard survey and the habitat suitability was subsequently downgraded in both instances. For stream Dike however, four of eight rafts appeared to have been interfered with either by a flail or moved by a landowner. As a result, only half the intended number of rafts were in suitable positions. Unfortunately, second standard survey was not possible on this ditch due to the dense vegetation and limited access to the bank.

95. Many watercourses had undergone extensive management between the deployment and collection of rafts, including flailing of the banks, to the toe of the bank in some cases. This reduces the habitat suitability for water vole due to the high level of disturbance and makes it difficult to survey because of the presence of cut vegetation potentially covering up signs of water vole presence.

96. Breeding marsh harrier *Circus aeruginosus*, were confirmed within the survey area. Marsh harrier is a protected species under Schedule 1 of the Wildlife & Countryside Act 1981, and it is an offence to intentionally or recklessly disturb birds or their young at, on or near an 'active' nest. Therefore, a buffer zone was put in place to prevent any disturbance to these birds. The survey of six watercourses were impacted by this buffer and therefore could not be assessed for their presence of water vole until after the birds had fledged. Ditch 59 was in immediate proximity to the nest and so could only be accessed once the nest was no longer active, therefore only one visit was possible on this ditch (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**).

18.4.5.9 Additional Notes

97. Additional pre-construction surveys for mobile ecological receptors, such as bats, water voles, breeding birds (within nesting season) and badgers, must be completed prior to the construction start as the status of these receptors may have changed following the surveys. For example, there may be trees that have developed new features that may support roosting bats or badger setts created at new locations.

98. Survey limitations can also be found in the appendices **(Volume 7, Appendix 18-2 to Appendix 18-9 (application ref: 7.18.18.2 -7.18.18.9)**).

18.4.6 Biodiversity Net Gain

99. The Biodiversity Net Gain (BNG) Strategy assessment methodology is outlined in **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10)**.

18.5 Existing Environment

18.5.1 Habitats

100. The baseline information presented in this section has been informed by the findings of the 2022 and 2023 habitat surveys. Some of the habitat data collected during 2022 represents areas no longer included within the current Onshore Study Area, so has therefore not been included within the ES. Full details of the habitat surveys are provided in **Volume 7, Appendix 18-2 (application ref: 7.18.18.2)**.

101. A total of 457.2ha of land, and 14.8 km of linear habitats of the Onshore Study Area has been mapped and surveyed. Some areas of road verge within the Onshore Development Area were inaccessible for the survey, this total only includes areas mapped and surveyed.

102. Within the Onshore Study Area, the following habitats were recorded (as per UKHab (v1) definitions):

- The vast majority of the area surveyed, 395.09 ha (86.41%), was cropland for a variety of crops and arable field margins;
- Grassland habitats (neutral grassland, other neutral grassland, *Arrhenatherum* neutral grassland, and modified grassland) amounted to 32.855ha (7.19%);
- Urban habitats (built up areas and gardens, developed land sealed surface, buildings, other developed land, artificial unvegetated unsealed surface, and suburban / mosaic of developed / natural surface) amounted to 6.586ha (1.44%);
- Woodland and forest habitats (wet woodland, other woodland; broadleaved, other broadleaved woodland types) amounted to 3.782ha (0.83%);
- Beach amounted to 14.37ha (3.14%);
- No access road verges amounted to 1.594ha (0.35%);
- Wetland habitats (lowland fens and other swamps) amounted to 1.871ha (0.41%);
- Heathland and shrub (bramble, hawthorn, and mixed scrub) amounted to 0.533ha (0.12%);
- Rivers and lakes (standing open water and canals, and rivers) accounted for 0.37ha (0.08%);
- Maritime cliff and slopes amounted to 0.168ha (0.04%); and

- For linear habitats hedgerows amounted to 16,927m, standing open water amounted to 4,773m, and line of trees amounted to 632m.

103. The habitats recorded have the potential to meet the criteria for the following priority habitats:

- Arable field margins;
- Arable margins sown with tussocky grasses;
- Arable margins sown with wild flowers or a pollen and nectar mix;
- Game bird mix strips and corners
- Lowland fens;
- Rivers;
- Maritime cliffs and slopes;
- Wet woodland; and
- Hedgerows.

104. The habitat surveys recorded that the Onshore Development Area runs through predominantly agricultural land, including improved grassland.

105. Arable fields are typically of low value and are suboptimal for use by protected and notable species. However, arable fields can also be an important wintering bird food sources and can provide nesting habitat for ground-nesting birds such as skylark *Alauda arvensis*. Terrestrial mammals such as brown hare (a priority species) also use arable fields for foraging and shelter.

106. A total of 47 native and 67 historically and ecologically important hedgerows will be impacted by the cutting/coppicing. For an In Isolation Scenario, the maximum width for hedgerow removal is 15m for the Export Cable Corridor and 20m for the Onward Cable Route. For Concurrent and Sequential Scenarios, the anticipated maximum width for hedgerow removal is up to 24m for the Onshore Export Cable Corridor and up to 34m for the Onward Cable Route to the Proposed Birkhill Wood National Grid Substation. Where the crossing of a hedgerow can be limited to a Haul Road only, the maximum hedgerow removal width would be limited to 5m. Where hedgerows intersect with construction access points off of existing roads, an average of 25m (12.5m from the centre point) of hedgerow will be removed for access and visibility splays, where possible this would be limited to pruning rather than full removal of a hedge. Locations of each hedgerow affected is provided in the **Tree Preservation Order & Hedgerow Plan (Revision 4)** [REP1-003].

107. Whilst it is anticipated that an average (across the Projects) of 25m of hedgerow could be lost per access location for visibility splays, the final amount of hedgerow loss will vary depending on the specifics of each access point and will be agreed at the detailed design stage through the Construction Traffic Management Plan and Ecological Management Plan. Through the detailed design of the accesses and crossings, the Projects will engage with the with East Riding of Yorkshire Council to reduce the amount of hedgerow loss through measures such as pruning, reduced speed limits or traffic signals. Based on this assumption, along with the associated hedgerow loss due to the off-route haul road, the Onshore Export Cable Corridor and any TCCs, the total estimated hedgerow loss as a result of the Projects, concurrent or sequentially would be approximately 5,592m. This calculation is subject to amendment at the detailed design stage when further micro siting and refinement of the design would be expected.

108. The baseline biodiversity values of habitats (Biodiversity Unit (BDU)) present within the Onshore Development Area are presented within **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10)**.

18.5.2 Statutory Designated Sites

18.5.2.1 International Statutory Designated Sites

109. The habitat survey report identified three SPAs (Greater Wash SPA, Hornsea Mere SPA, and Humber Estuary SPA) and one SAC (Humber Estuary SAC) within the zone of influence (10km) of the Onshore Study Area (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**). They can be seen on **Volume 7, Figure 18-2 (application ref: 7.18.1)**. As the sites have international protection, the sites are of international ecological importance.

110. In accordance with the criteria set out in **Table 18-9,** all international statutory designated sites for nature conservation are of very high importance.

111. The full habitat survey report including designations can be found in **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**.

112. There is an area of land within the Onshore Development Area that falls within 10km of the Humber Estuary SPA/Ramsar. An assessment was undertaken to determine the area's suitability to being functionally linked to qualifying bird species of the SPA. The assessment found that "*the area considered as potential Functionally Linked Land does not provide suitable foraging/breeding habitats or is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which the Humber Estuary SPA / Ramsar site has been designated. Based on the assessment of the data collected associated with the DBS proposal so far, as well as consultation with the professional ornithologists that carried out the field work, it can be established with considerable amount of confidence that the part of the Onshore Development Area that falls within 10km of the Humber Estuary SPA/Ramsar does not form part of the land functionally linked to the designated site.*" Natural England were consulted and agreed with the result of the assessment. Further details in regard to the Functionally Linked Land Assessment can be viewed in **Report to Inform Appropriate Assessment Habitats Regulations Assessment (Volume 6, application ref: 6.1)**.

113. The Greater Wash SPA is adjacent to the Landfall Zone and emergency beach access. Hornsea Mere SPA and Humber Estuary SPA/ SAC are also within 10km of the Onshore Development Area. Likely significant effects to the onshore habitat sites have been assessed in the HRA Screening Report (RWE Renewables, 2022a). There is connectivity between the costal catchment and the Greater Wash SPA, however there will be a negligible effect on the site, as described and impact assessed in **Volume 7, Chapter 20, Flood risk and Hydrology (application ref: 7.20).** Greater Wash SPA was screened out of any further assessment.

114. Humber Estuary SPA was screened in but was later scoped out upon consultation with NE. NE have also agreed there would be no impact on Functionally Linked Land based on the results of the overwintering bird surveys. As such, they are not a receptor of the proposed works and are screened out of further assessment in this report. The reasons for screening out the Habitat Sites are listed below:

- Works within the Onshore Export Cable Corridor will be undertaken to a shallow depth (approx. 1m), there may be a hydrological connection through ground or surface water, but mitigation would be implemented. In the event of an accidental spill, increased suspended sediments during construction from runoff. The impacts will be controlled through the OCoCP. Therefore, the likely significant effects are **negligible** and will not impact the designated sites. As a result there will be no

alterations to the groundwater/hydrology regime of the Hornsea Mere SPA or Humber Estuary SPA/SAC (**Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19) and Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**);

- Due to the closest site of Hornsea Mere SPA being approximately 2km to the east, there will be no perceptible effects to air quality within the site as a result of the works within the Onshore Export Cable Corridor;
- The distance of the Onshore Development Area to the SPA also removes the risk of direct physical disturbance to the species listed on the SPA citation;
- Qualifying species (gadwall *Anas strepera* and mute swan *Cygnus olor*) of Hornsea Mere SPA are typically found in areas such as gravel pits, lakes, reservoirs, there will be no pathway for significant effects on Functionally Linked Land to the SPA from the Projects. Functionally Linked Land is areas of land occurring outside designated sites, which is critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a SAC, SPA or Ramsar site has been designated; and
- Given the built-up nature, of the land between the SPA and the export cable corridor and the limited physical area the construction works will encompass, there will be no pathway for significant effects from the Projects on any Functionally Linked Land to the Humber Estuary SPA.

115. Relatively small areas of the Humber Estuary SAC, have been screened in for potential changes to air quality based on proximity to the road network links carrying construction vehicles. The area, relates to 22.9ha of mudflats and sandflats not covered by seawater at low tide along the River Hull, 200m either side of the A63 trunk road and A15 Humber Bridge as seen on **Volume 7, Figure 18-6 (application ref: 7.18.1)**. The air quality assessment considers direct effects on the mudflats, a habitat that occupies 6,640ha of the SAC, and is a qualifying feature of statutory designated nature conservation site. The detailed air quality impact assessment identified that in these areas of the Humber Estuary SAC there are already exceedances of >1% but less than 3.5% of a Critical Load or a Critical Level as it stands, i.e. without any contribution of air emissions (NOx and NH_3) from traffic associated with the Projects. Air emissions from construction vehicles associated with the Projects alone are expected to be <1% of a Critical Load or a Critical Level. Further details are given in **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**.

18.5.2.2 National and Local Statutory Designated Sites

116. The habitat survey report identified five SSSIs, and one Local Nature Reserve (LNR), within 2km of the Onshore Study Area (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**). These were: Burton Bushes SSSI, Leven Canal SSSI, Pulfin Bog SSSI, Hornsea Mere SSSI, and Beverley Parks LNR. They can be seen on **Volume 7, Figure 18-3 (application ref: 7.18.1)**.

117. Pulfin Bog SSSI comprises lowland fen habitat and is valued for its botanical interest, and its reedbed habitat it provides breeding birds. The breeding bird community is characteristic of reed and fen habitats, including reed bunting *Emberiza schoeniclus* and sedge warbler *Acrocephalus schoenobaenus*, both of which are amber listed Birds of Conservation Concern (BoCC) (Stanbury *et al.*, 2021). Reed warbler *Acrocephalus scirpaceus* is also present.

118. Hornsea Mere SSSI is of value for various bird species, particularly over-wintering gadwall. The site is also important for over-wintering golden eye *Bucephala clangula*, pochard *Aythya ferina*, shoveler *Anas clypeata* and tufted ducks *Aythya fuligula*. The site is also important for post-breeding mute swan, breeding reed warbler and roosts of starling *Sturnus vulgaris*. Goldeneye, pochard and starling are red listed BoCC, whilst gadwall and shoveler are amber listed BoCC (Stanbury *et al.*, 2021).

119. A further two SSSIs are present – Withow Gap SSSI and Skipsea Bail Mere SSSI. However, these two sites are designated for geological features only. Impacts to these sites are addressed in **Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)** and therefore are not discussed further in this chapter.

120. The Humber Estuary is also a SSSI site, but it is over 2km from the Onshore Development Area and apart from the potential impacts to air quality mentioned above, no further assessment is required.

121. Humber Bridge Country Park LNR is a former chalk quarry designated for its mosaic of habitats including mixed species woodland, spring fed pond and herb rich grassland. Despite being located just under 10 km from the Onshore Development Area, this LNR has been included here because of potential impacts to the reserve's broadleaved deciduous woodland associated with changes to air quality from construction vehicle movements. The detailed air quality impact assessment identified that areas of the Humber Bridge Country Park LNR had exceedances of a Critical Load or a Critical Level through a contribution of air emissions, NOx and NH_3, from traffic associated with the Projects that was >1% but less than 3.5%. Further details are given in **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**.

122. In accordance with the criteria set out in **Table 18-9**, SSSIs are considered areas of high importance and LNRs are of medium importance.

123. The designated sites can be seen on **Volume 7, Figure 18-4 (application ref: 7.18.1)**. The full habitat report including the designations can be found in **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**.

18.5.3 Non-statutory Designated Sites

124. The habitat survey report identified 23 non-statutory Local Wildlife Sites (LWSs) within 2km of the Onshore Study Area (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**). The LWSs were typically designated for their habitats, including grassland, hedgerows and woodland. One LWS was designated for standing water and another LWS was designated for waxcap grassland fungi. None of these sites are designated for any bird species.

125. A total of 44 "Deleted" and "Historic" LWSs were present within the search area, for which no citation was provided. A full list of these can be found in **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**.

126. The designated sites can be seen on **Figure 18-4 (application ref: 7.18.1)**. The full habitat report including the designations can be found in **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**.

127. Non-statutory designated sites for nature conservation have been avoided where possible; however, there are six non-statutory designated nature conservation sites wholly or partially within or adjacent to the Onshore Development Area as presented in **Table 18-14** and shown on **Volume 7, Figure 18-4 (application ref: 7.18.1)**.

128. In accordance with the criteria set out in **Table 18-9,** all non-statutory designated sites are of medium importance.

18.5.4 Protected and Notable Species

129. This section provides a summary of the key species recorded within the Onshore Study Area, drawing from information from the following sources:

- **Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**;
- **Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**;
- **Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4)**;
- **Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**;
- **Volume 7, Appendix 18-6 Bats Report – Monthly Activity Transects (application ref: 7.18.18.6)**;
- **Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**;
- **Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**; and
- **Appendix 18-9 Water Voles and Otters Report (Revision 2)** [document reference 7.18.18.9].

18.5.4.1 Amphibians, Including Great Crested Newt

130. The Desk Study identified 17 records of GCN within the Onshore Study Area (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**).

131. A desk-based review identified total of 72 ponds within the 250m Zone of Influence (ZoI) of the Onshore Development Area and a further 54 ponds outside the ZoI but with potential good connectivity were surveyed (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**). The locations of the ponds identified within the ZoI can be seen in **Volume 7, Figure 18-5 (application ref: 7.18.1)**.

132. Of these ponds, 57 had neither an eDNA or Habitat Suitability Index (HSI) undertaken, due to access reasons (ten), were dry or non-existent (42), or were stocked for fishing (five). A further ten ponds were HSI assessed but were dry when the eDNA survey was due to be carried out or not accessible, as seen in Table 3 of **Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**. The HSI appraisals of the ponds surveyed the following suitability classifications of the ponds as GCN breeding ponds:

- Excellent: six ponds;
- Good: 11 ponds;
- Average: 13 ponds;
- Below average: 23 ponds; and
- Poor: 17 ponds.

133. Of the ponds analysed for GCN eDNA, one pond within the Onshore Study Area returned a positive result, and a further nine ponds within the 250m GCN buffer were found to be positive (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**).

134. Suitable terrestrial habitat for supporting foraging and hibernating GCNs was observed within the Onshore Study Area. Part of the HSI assessment includes an assessment of the habitat surrounding a potential breeding pond for its suitability to support foraging and hibernating GCNs. Full survey results are provided in **Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**.

135. GCN are an EPS which means GCN has full protection under The Conservation of Habitats and Species Regulations 2017. It is an offence to deliberately capture, injure or kill, or deliberately disturb EPS and therefore in accordance with the criteria set out in **Table 18-9,** they are of high importance. Palmate newts are of medium importance as they are recorded in the area and listed on the LBAP, smooth newts however are not listed on the LBAP, but are found within the wider East Riding area, so are of low importance.

18.5.4.2 Badger

136. The Desk Study identified two records of badger within 2km of the Badger Survey Area (**Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4)**), both of which were not in the Badger Survey Area. The Badger Survey Area comprised the Onshore Development Area plus a 30m buffer.

137. The field surveys identified four badger setts within the Onshore Study Area and a further five setts within 30m of the Badger Survey Area (**Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4)**). Badger activity along the Onshore Development Area was found to be concentrated in areas to the north-east of Beverley **(Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4)**).

138. The Onshore Development Area provides suitable terrestrial habitat for foraging and commuting badger as well as for sett creation.

139. As a widespread species which is not threatened or rare in the county, in accordance with the criteria set out in **Table 18-9,** badgers are of low importance.

18.5.4.3 Bats

18.5.4.3.1 Roosting bats

140. Four of the records identified in the desk study related to roost records within 1km of the Onshore Study Area (**Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**). These roosts were of common pipistrelle *Pipistrellus pipistrellus*, and parti-coloured bat *Vespertilio murinus*, however, further details on roost type or location are not specified (e.g. building or tree).

141. In total 61 trees were surveyed within the Onshore Development Area. 48 trees were identified to have potential to support multiple roosting bats. A total of 34 trees would be potentially impacted as a result of the Projects. Of the 34 trees potentially impacted as a result of the Projects, seven were found to be of high potential to support roosting bats, 17 of moderate potential and 10 of low potential.

142. In a number of instances trenchless crossing techniques have been selected to avoid direct impacts to these trees. Taking this into account, only 13 trees with potential to support multiple roosting bats would be potentially impacted by the Projects. This consists of two of high potential to support roosting bats, five of moderate potential and six of low potential.

143. The trees are located across the Ground Level Tree Assessment Survey Area. The 13 trees which would be potentially impacted by the Projects are identified by a 'X' and the trees which would be avoided due to trenchless crossing are identified by a '✓' in Appendix B of **Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5) (Revision 2)**. The 13 trees with potential to support multiple roosting bats which would be potentially impacted by the Projects are also highlighted in Appendix C of **Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5) (Revision 2)**. Any trees not marked with a 'X' or a '✓' are either located in Bentley Moor Wood, which is not being impacted by the Projects or will be retained as part of the Landscaping.

144. Ash dieback was observed in the trees surveyed, therefore, their bat suitability could change quicker than normal as the disease could trigger new features to appear, quicker than usual e.g. flaking bark, broken limbs, cracks and cavities. It is also possible for infected trees to fall or collapse unexpectedly in virtue of the disease.

145. The Onshore Development Area provides suitable habitat and features for roosting bats.

146. All resident bat species are EPS and therefore in accordance with the criteria set out in **Table 18-9**, they are of high importance.

18.5.4.3.2 Foraging and commuting bats

147. The Desk Study identified 18 records within 1km of the Onshore Study Area. These records related to common pipistrelle, Nathusius' pipistrelle *P. nathusii*, unknown pipistrelle species *Pipistrellus spp.*, Daubenton's bat *Myotis daubentonii*, whiskered bat *M. mystacinus*, noctule *Nyctalus noctula*, brown long-eared *Plecotus auritus* and parti-coloured bat, and other unidentified species (**Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (application ref: 7.18.18.5)**). Of particular interest is the parti-coloured bat recorded in 2010, a rare species in the UK that has only been found in the south of England, vagrants, which occasionally cross the English Channel from Europe, with one or two records per year (BCT, 2010). Parti-coloured bat are not currently considered a resident species and are very hard to distinguish from Leisler's bat *Nyctalus leisleri*, unless seen in the hand.

148. Monthly transect surveys were undertaken between April and October 2023. Species distribution was largely consistent across the different transects, with common pipistrelle the dominant species along many transects (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

149. The seven species recorded during the static monitoring and transect surveys were: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's, Daubenton's bat, and whiskered/Brandt's bat (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). *Myotis spp.* and *Pipistrelle spp*. were also recorded, where species level was not able to be determined (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

150. Surveyors also recorded several common pipistrelle bats commuting towards the coast along a road leading west out of Skipsea, with at least 11 individuals observed approximately 30 minutes after sunset in July, also indicating likely presence of a common pipistrelle roost in one of the houses on Hornsea Road (approximate location NGR TA 17381 55128) (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

151. The majority of the habitats within the Onshore Development Area are of low suitability for foraging and commuting bats, with some parcels of woodland and hedgerows providing moderate habitat and connectivity to the wider landscape respectively (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). Habitats frequently used by foraging and commuting bats included the River Hull, field drains, boundary hedgerows and woodland edges (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

152. Monthly static monitoring surveys were carried out (one per transect). Species recorded included common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, noctule, Leisler's bat Daubenton's bat, Natterer's bat, whiskered/Brandt's bat and at least one undetermined *Myotis* species (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

153. Static detectors along Transect (T) 1, T5, and T8 recorded the greatest number of species whilst T7 recorded the lowest number (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). An increase in bat activity on T4 occurred each night within the October monitoring period between midnight and 5am, indicating possible swarming which takes place during the night rather than around dusk or dawn (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). Activity levels at the static monitoring device locations on T4, T5 and T8 were significantly higher in October than across the rest of the survey season. This could be attributed to swarming activity, presence of a nearby transitional roost used prior to hibernation, or increased foraging prior to hibernation (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

154. The rarity of species within the assemblage was assessed using the UK Bat Mitigation Guidelines (Reason and Wray, 2023). Common pipistrelle, soprano pipistrelle and brown long-eared bats are 'widespread' within the Northern England region. Whiskered/Brandt's, Daubenton's bat, Natterer's bat and noctule are 'widespread in many geographies, but not as abundant in all', and Leisler's bat and Nathusius' pipistrelle are considered 'rarer or restricted distribution' (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

155. Habitats and features of interest for bats are recorded in **Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6),** they include watercourses such as the River Hull, woodland, woodland edges, and bridges.

156. The Onshore Development Area provides suitable habitat including woodland, hedgerows, rivers, and streams, for roosting, foraging and commuting bats.

157. All resident bat species are EPS and therefore in accordance with the criteria set out in **Table 18-9**, they are of high importance.

18.5.4.4 Birds

158. The full Desk Study results are available in **Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**. The results identified 75 species of bird recorded within 2km of the Onshore Study Area. Of these, 18 were listed in Schedule 1 of the WCA and 67 were listed as Red or Amber Birds of Conservation Concern (BoCC) (Stanbury et al., 2021) (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). Bird species listed on WCA Schedule 1 only benefit from protection during the breeding season, and not while over wintering.

159. The desk study returned 22 priority species protected under Section 41 of the NERC Act (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). These species were: bittern *Botaurus stellaris*, lesser redpoll *Acanthis cabaret*, skylark *Alauda arvensis*, cuckoo *Cuculus canorus*, corn bunting *Emberiza calandra*, yellowhammer *Emberiza citrinella*, reed bunting *Emberiza schoeniclus*, linnet *Linaria cannabina*, grasshopper warbler *Locustella naevia*, yellow wagtail *Motacilla flava*, curlew *Numenius arquata*, house sparrow, tree sparrow *P. montanus*, grey partridge *Perdix perdix*, wood warbler *Phylloscopus sibilatrix*, marsh tit *Poecile palustris*, dunnock *Prunella modularis*, Eurasian bullfinch *Pyrrhula pyrrhula*, starling *Sturnus vulgaris*, song thrush *Turdus Philomelos*, ring ouzel *Turdus torquatus*, and lapwing *Vanellus vanellus*.

18.5.4.4.1 Over-wintering Birds

160. The over-wintering bird surveys, between October 2022 and March 2023, identified a total of 104 species along eight transect survey routes, with an average of 58 species recorded per transect. Sixty BoCC were recorded, consisting of 19 red listed and 41 amber listed species. In addition, 12 WCA Schedule 1 species were recorded (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). A total of 17 species protected under Section 41 of the NERC Act were recorded (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

161. Eight transect survey routes were selected, based on key habitat areas in order to be representative of the whole Onshore Study Area. Transect (T) 1 recorded the most SPA species (11), these related to the Humber Estuary SPA, however none of these were in significant numbers (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). T7 recorded the most (15) species protected under Section 41 of the NERC Act (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). T5 recoded the most species (66) observed on one transect route (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

162. All the SPA species identified across all transects were recorded in 'low' or 'not significant' numbers (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). These species were: brent goose *Branta bernicla*, goldeneye *Bucephala clangula*, grey plover *Pluvialis squatarola*, golden plover *P. apricaria*, mallard *Anas platyrhynchos*, teal *A. crecca*, wigeon *A. penelope*, oystercatcher *Haematopus ostralegus*, redshank *Tringa totanus*, ringed plover *Charadrius hiaticula*, sanderling *Calidris alba*, ruff *C. pugnax*, marsh harrier *Circus aeruginosus*, lapwing, and curlew (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

163. Species protected under Section 41 of the NERC Act recorded were: dunnock *Prunella modularis*, herring gull *Larus argentatus*, bullfinch, grey partridge, house sparrow, lapwing, linnet, reed bunting, skylark, song thrush, starling, tree sparrow, yellowhammer, corn bunting, curlew, lesser redpoll and marsh tit (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

164. Farmland birds recorded across all the transects were grey partridge, linnet, skylark, tree sparrow, yellowhammer, reed bunting, and corn bunting. Notably, close to 50 skylarks were recorded in one occasion on T1 (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

165. The Onshore Development Area therefore provides suitable terrestrial habitat for low numbers over-wintering birds listed within the SPA citations (although not considered to be functionally linked to SPAs as forementioned), species protected under the NERC Act, and protected or notable farmland birds.

166. In accordance with the criteria set out in **Table 18-9**, over-wintering bird populations which form part of the cited interest of an internationally or nationally designated site are of high importance. Other over-wintering bird populations are of medium to low importance, depending on the conservation status of the species.

18.5.4.4.2 Breeding Birds

167. The 2023 breeding bird surveys identified a total of 116 species (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**). Sixty-nine BoCC species were recorded, consisting of 21 red listed and 48 amber listed species (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**). In addition, 11 WCA Schedule 1 species were recorded (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

168. In the local context, the vast majority of species recorded across the surveyed transects consisted of those categorised as "*abundant*", "*common*" or "*fairly common*" in East Yorkshire (Dobbs, 2022), with seven "*uncommon*" species recorded within the breeding assemblage; barn owl, bullfinch, gadwall *Mareca strepera*, lapwing, marsh tit, tree sparrow and yellow wagtail (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**). "*Scarce*" breeders were marsh harrier and Cetti's warbler *Cettia cetti*, both WCA Schedule 1 (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

169. Eight transect survey routes were selected to cover the majority of the Onshore Development Area. T1 recorded the most species (78) of all the transects (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**). T8 had the most confirmed breeders (20), T5 had the most probable breeders (22), T4 had the most possible breeders (24) and the most Schedule 1 species (8) (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

170. Potential impacts to the Humber Estuary SPA, Greater Wash SPA, Hornsea Mere SPA, and Pulfin Bog SSSI have been screened out and land within the Onshore Survey Area was not considered to be FLL for any of the associated breeding bird species. More detail can be seen in **Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**.

171. Species recorded under WCA Schedule 1 were red-throated diver *Gavia stellata*, kingfisher *Alcedo atthis*, redwing *Turdus iliacus*, fieldfare *T. pilaris*, hobby *Falco subbutero*, peregrine *F. peregrinus*, whooper swan *Cygnus cygnus*, barn owl, marsh harrier, and Cetti's warbler (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

172. Of the WCA Schedule 1 species recorded, barn owl was confirmed breeding on T4, classed as a probable breeder on T3, and classed as a possible breeder on T1, T5, T7, and T8. Cetti's warbler was classed as a probable breeder on T4, and a possible breeder on T5. Marsh harrier was confirmed as a breeder on T5 and was seen in flight on T4. Finally, hobby was classed as a possible breeder on T6 (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**). Full results can be seen in **Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**.

173. A total of eight farmland birds were recorded in low densities during the field surveys, and in some cases specific locations only, which would imply the habitats do not provide optimal condition for breeding farmland birds (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

174. The Humber Estuary has four breeding bird species listed as qualifying features: marsh harrier, bittern, little tern and pied avocet. The habitats within the Onshore Development Area do not provide suitable foraging or breeding habitats for the latter three species and is unlikely to be part of or impact FLL for these species. Whilst marsh harriers were confirmed breeding at locations adjacent to the Onshore Development Area, existing habitats are unlikely to be functionally linked to the SPA breeding population due to the distance and their typical home ranges (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

175. The Greater Wash SPA is located immediately adjacent to the Landfall location at the northern end of the survey corridor. The site is designated for its breeding sandwich tern, common tern and little tern. The site does not provide suitable breeding habitat for these species. Whilst common tern was recorded in association with the River Hull, which is dissected by the proposed cable route, the watercourse was not considered to be functionally linked to the SPA for common tern due to the distance (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

176. Hornsea Mere SPA is located approximately 2.4km to the east of the survey corridor. This site is designated for non-breeding waterfowl species; therefore, this is not a consideration for the breeding season impacts and any potential FLL (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

177. Pulfin Bog SSSI is located approximately 1.2km to the west of the survey corridor, due to the short-term nature of the works, and location outside of this site, it is unlikely that there will be any impacts to the site, or the birds associated with it (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

178. The Onshore Development Area therefore provides suitable terrestrial habitat for breeding birds listed within the SPA citations, species protected under the NERC Act, and farmland birds.

179. In accordance with the criteria set out in **Table 18-9**, breeding bird populations which form part of the cited interest of an internationally or nationally designated site are of high importance. Other over-wintering bird populations are of medium to low importance, depending on the conservation status of the species.

18.5.4.5 Fish

180. There are numerous watercourses within the Onshore Study Area which could provide suitable habitat for protected fish species. However, as trenchless technique is being implemented under all main rivers and most ordinary watercourses, they have been scoped out of the assessment.

181. Lamprey have been scoped out as the River Hull is not considered a hotspot for the species as advised by the Environment Agency and will be avoided by using trenchless technique.

18.5.4.6 Hazel Dormouse

182. Hazel dormouse *Muscardinus avellanarius* have been scoped out of the assessment as the Projects are located outside the species known distribution and East Riding of Yorkshire Council has confirmed the likely absence of this species from the Onshore Study Area (RWE Renewables, 2022b).

18.5.4.7 Invertebrates, Including White-clawed Crayfish

183. The desk study and habitat surveys concluded that there was no further need for invertebrate surveys.

184. Terrestrial invertebrates have been scoped out following the desktop survey results and overall low distinctiveness of the habitats that will be affected by the Projects, as well as the temporal nature of the disturbance.

185. There were no records of white-clawed crayfish within 2km of the Onshore Study Area. White-clawed crayfish have been scoped out due to the absence of records and their distribution ranges.

18.5.4.8 Otter

186. The Desk Study identified 14 records of otter within 2km of the Onshore Development Area (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**).

187. There was information available from one EPS licence for disturbance to otter between August 2017 and January 2019 along the River Hull, approximately 3.1km south of the Onshore Study Area, indicating the presence of otter along the river (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**.

188. The riparian habitat within the corridor provided suitable commuting and foraging habitat for otter (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

189. The terrestrial habitat within the Onshore Development Area was primarily arable land and largely unsuitable for otter rest sites or holts, except for the sheltered area of wet woodland area to the south and west of Ditch 59 and north of South Bullock Dike which provided some suitable habitat (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

190. Eighty-one watercourses were surveyed for otter. Spraint was found on three: Stream Dike, Beverly Barmston Drain, and Ditch 80 (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**).

191. Fish, an important food source for otters, were noted in several of the watercourses including the River Hull, Beverley Barmston Drain, South Bullock Dike, Monk Dike and Meaux and Routh East Drain (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

192. Otter are EPS and therefore in accordance with the criteria set out in **Table 18-9**, they are of high importance.

18.5.4.9 Other Notable Species

193. Beaver *Castor fiber* have been scoped out of the assessment as there are no known populations in the East Riding of Yorkshire area.

194. No specific surveys were completed for other notable species including hedgehog and brown hare.

195. Due to the suitable habitats present the surveys determined that the Onshore Development Area is likely to be suitable for brown hare.

196. Hedgehogs were recorded on some occasions during other surveys, such as bat activity surveys. Therefore, they are considered present within the Onshore Development Area.

197. In accordance with the criteria set out in **Table 18-9,** hedgehog and brown hare are of low ecological importance.

18.5.4.10 Reptiles

198. The desk study and the findings of the habitat surveys concluded that there was no further need for targeted reptile surveys.

199. Due to their southern distribution ranges, it is unlikely that either of the two EPS reptile species (sand lizard and smooth snake) would be found in the Onshore Development Area. Therefore, these two species have been scoped out of the assessment.

200. In accordance with the criteria set out in **Table 18-9**, all reptile species that could use the Onshore Study Area are of medium importance.

18.5.4.11 Water Vole

201. The Desk Study identified 55 records for water vole within 2km of the Onshore Development Area (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

202. Eighty-one watercourses were surveyed for water vole. Eight watercourses had evidence of water vole identified during the surveys. Six of these ditches were clustered north of Beverly, either side of the River Hull crossing (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

203. American mink *Neovision vison* scat was observed on Ditch 5 and Holderness Drain, generally, if mink are present, water vole is likely to be absent (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

204. In accordance with the criteria set out in **Table 18-9**, water vole is of medium importance.

18.5.4.12 Invasive Non-Native Species (INNS)

205. INNS plant species were identified in the area during the 2022 habitat surveys, including Japanese knotweed *Reynoutria japonica*, Himalayan balsam *Impatiens glandulifera*, and two records of snowberry *Symphoricarpos albus*. However, none were identified during the 2023 habitat survey report after the Onshore Development Area was refined (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**).

206. American mink *Neovision vison* scat was observed on Ditch 5 and Holderness Drain, generally (**Volume 7, Appendix 18-9 Water Voles and Otters Report (application ref: 7.18.18.9)**

207. Following the desk study and habitat field surveys, it concluded that there was no further need for additional INNS surveys.

18.5.5 Future Trends

208. In the event that the Projects are not developed, an assessment of future baseline conditions for terrestrial ecology has been carried out and is described within this section.

209. Statutory and non-statutory designated sites would continue to be managed by the relevant organisations, to protect the designated flora and fauna. It is assumed that areas of land used for agriculture and residential will continue to be managed in the same way.

210. Climate change could affect species distribution and abundance. If management of habitats and species continues as current, populations of species could decrease due to climate change reducing and shifting the ranges of species, or increase species population sizes, allowing to have a higher rate of winter survival in more northern parts of the country. Furthermore, hazel dormouse and beavers are being re-introduced across the country which could lead to an increased distribution range for these species. Licences for water vole mitigation are now also available so areas could become compensation sites for water vole, allowing this species to increase its range.

211. Due to climate change sea levels are expected to rise, this could result in a loss of terrestrial habitats along the coast and habitat change would occur. Freshwater river and streams would have an increase in salinity if they were flooded by sea water, potentially affecting populations of fish, invertebrates, and other aquatic species.

212. In general, most species of conservation concern which have been subject of targeted ecological surveys in relation to this ES chapter are experiencing negative trends in the form of population declines, shifts or contractions in range, habitat loss, fragmentation of habitats and species populations, and from the spread of diseases and non-native species. These long-term trends are associated with a myriad of factors including climate change, alterations to land-uses (particularly intensification of farming and increased built development), increased human disturbance, and anthropogenic pollution of waters, land, and air.

213. However, measures such as legislation regarding protection of species and habitats, changing farming practices and nature conservation efforts are limiting the magnitude of these negative trends (or in some cases, reversing them), particularly at specific scales relevant to the onshore cable corridor (e.g. county / district scale). Where a valued ecological receptor is known to be experiencing baseline natural trends that are relevant to this impact assessment, this is noted in the individual receptor's assessment presented in section 18.6.

18.6 Assessment of Significance

18.6.1 Potential Effects During Construction

18.6.1.1 Impact 1: Construction Disturbance to Statutory Designated Nature Conservation Sites.

214. Embedded mitigation as described in **Table 18-4** has included the avoidance of statutory designated sites for nature conservation where possible as part of the site selection and route planning process. As a result, there will be no direct impacts to designated sites such as SSSIs, SCA's and SPAs (**Report to Inform Appropriate Assessment Habitat Regulations Assessment (Volume 6, application ref: 6.1)**). Statutory international and national designated nature conservation sites can be seen on **Volume 7, Figure 18-2 (application ref: 7.18.1)** and **Volume 7, Figure 18-3 (application ref: 7.18.1)**.

215. There will be no hydrological impact on the statutory designated sites because of trenchless techniques that are being proposed to avoid disturbance to main rivers. Some watercourses within the Onshore Development Area will be open cut, in these cases there will also be no significant effects on connected designated sites due to the planned embedded mitigation as outlined in **Volume 7, Chapter 19 Geology and Land Quality (application ref 7.19)** and **Volume 7, Chapter 20, Flood risk and Hydrology (application ref: 7.20)**.

216. There is connectivity between the coastal catchment and the Great Wash SPA, which is expected to have a **minor adverse** effect due to the high sensitivity and negligible impact following mitigation measures, as described and impact assessed in **Volume 7, Chapter 20, Flood risk and Hydrology (application ref: 7.20)**.

217. No impact to hedgerows connected to designated sites is anticipated.

218. The HRA screening concluded that there was a potential pathway for effect on Functionally Linked Land (FLL) for the Humber Estuary SPA **(Appendix A HRA Screening Report (Volume 6, application ref: 6.1.1))**. However, further review of survey information collected within the potential FLL area determined that it does not provide suitable foraging/ breeding habitats or is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which the Humber Estuary SPA/ Ramsar site has been designated (see **Report to Inform Appropriate Assessment Habitat Regulations Assessment (Volume 6, application ref: 6.1)**). This is discussed further on in this section under overwintering birds.

219. With the reduction of the Onshore Development Area since the PEIR, Burton Bushes SSSI and Beverly Parks LNR are no longer adjacent to the Onshore Development Area. Burton Bushes SSSI is now approximately 0.12km away, and Beverley Parks LNR is 0.62km away. These sites can be seen on **Volume 7, Figure 18-3 (application ref: 7.18.1)**. Burton Bushes SSSI is designated for its oak woodland. The woodland is also listed on the Ancient Woodland Inventory. Beverly Park LNR is designated for its mixed broadleaved woodland, the largest recently planted non-commercial orchard of traditional northern apple varieties, and two fields being restored as traditional parkland. Both sites have been screened out from impacts on potential changes to air quality as detailed in **Volume 7, Chapter 26, Air Quality (application ref: 7.26)**.

220. The Humber estuary SAC/SSI has been screened in for assessment on potential changes to air quality as detailed in **Volume 7, Chapter 26, Air Quality (application ref: 7.26)**.

221. There is the potential for disturbance caused by works associated with the Onshore Export Cable Corridor and Onshore Converter Stations due to activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access), noise disturbance from increased traffic, and trenchless crossing such as HDD. These sites are unlikely to be affected by works associated with the Landfall, due to the distance between the designated sites and these areas.

222. No mechanisms or pathways have been identified likely to impact other statutory designated sites.

18.6.1.1.1 Magnitude of Impact – All Scenarios

223. For all Scenarios (In Isolation, Concurrently or Sequentially) the magnitude of impact for disturbance caused by works associated with the Onshore Export Cable Corridor and Onshore Converter Stations is negligible as construction activities would not adversely affect the integrity or conservation status of the statutory sites. Any fugitive emissions would be controlled by the measures set out in **Table 18-4** including the **Outline Ecological Management Plan (application ref: 8.10)**, **Outline Code of Construction Practice (application ref 8.9)** and the **Outline Construction Traffic Management Plan (application ref: 8.13)**.

224. As detailed in **Volume 7, Chapter 26, Air Quality (application ref: 7.26)** potential impacts on air quality at the Humber estuary SAC are likely to be temporary, with >1% exceedances of the critical loads for Nitrogen deposition at the Humber Estuary SAC/SSI occurring over a short period of the construction process resulting in short-term peak in airborne pollutants from the construction vehicles. Furthermore, impacts arising from potential changes air quality at the Humber Estuary SAC refer only to a localised area of 22.9ha of mudflats along the River Hull adjacent to the A15 and A63 trunk road that represents a 0.36% of the habitat available within the SAC. Given that the total area of mudflats in the Humber Estuary SAC is approximately 6420ha, the temporary impact of the Projects on this habitat via the contribution to vehicular air emissions is considered to be negligible (unmeasurable) if the whole extent of this habitat within the designated sites is considered.

225. As the Projects under all scenarios will last for over a year, the duration is classed as long term.

18.6.1.1.2 Sensitivity of Receptor

226. Humber Estuary SAC/SSSI is considered of very high importance and sensitivity. Intertidal mudflats are sensitive to pollution such as diffuse and point source discharges from roads and urban areas that include polluted stormwater runoff. This can create abiotic areas or produce algal mats which may affect invertebrate communities.

227. Burton Bushes SSSI is of high importance and high sensitivity as ancient woodland is unable to tolerate effects resulting in permanent change in its abundance or quality as it is irreplaceable habitat.

228. Beverley Parks and Humber Bridge Country Park LNRs are of medium importance and medium sensitivity. LNRs are typically designated for their local nature conservation importance and for their value to people. Therefore, their nature conservation importance would not be expected to meet the same threshold as SSSIs. The sites are not ancient woodland and is therefore a habitat that is easier to replace.

18.6.1.1.3 Significance of Effect – All Scenarios

For all construction scenarios, with embedded mitigation listed in **Table 18-4** and those mitigation measures detailed in **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**, the significance of effect to very high and high sensitivity statutory designated sites, Humber Estuary SAC/SSI and Burton Bushes SSSI, would be **minor** adverse which is not significant in EIA terms. For both LNRs this results in a **negligible** adverse significance of effect.

18.6.1.1.4 Mitigation and Residual Significance of Effect – All Scenarios

229. The potential significance of effect is **negligible** to **minor** adverse, which is deemed to be not significant in EIA terms. Therefore, no additional mitigation is required.

18.6.1.2 Impact 2: Construction Disturbance to Non-Statutory Designated Nature Conservation Sites.

230. There are six non-statutory designated nature conservation sites wholly or partially within or adjacent to the Onshore Development Area as presented in **Table 18-14** and shown on **Volume 7, Figure 18-4 (application ref: 7.18.1).** Only those non-statutory designated sites which are partially or wholly within or directly adjoining the Onshore Development Area have been considered in this assessment. Bentley Moor Wood LWS has been screened in for assessment on potential changes to air quality as detailed in **Volume 7, Chapter 26, Air Quality (application ref: 7.26)**.

Table 18-14 Details of Non-Statutory Sites Within or Adjacent to the Onshore Development Area

Site name and Designation	Qualifying feature(s)	Location and recommended / potential mitigation measures
Beeford - Dunnington Road Verge (LWS)	Presence of a good quality, established semi-natural grassland verge.	Partially within the Onshore Development Area. HDD or other trenchless technique cannot be employed at this location as an access road is required. Reinstatement of the LWS will be required under consultation from ERYC and the Yorkshire Wildlife Trust.
Nunkeeling Lane (LWS)	Good quality road verge and ditch habitats, and species-rich, important hedgerow.	Partially within the Onshore Development Area. Although most impacts to the (LWS) will be avoided by the selection of a trenchless crossing technique e.g. HDD, a small section will be affected by the construction of a temporary Haul Road crossing. Reinstatement of the LWS will be required under consultation from ERYC and the Yorkshire Wildlife Trust.

Site name and Designation	Qualifying feature(s)	Location and recommended / potential mitigation measures
Raventhorpe Embankment (LWS)	Good quality, established semi-natural grassland.	Partially within the Onshore Development Area although most impacts to the (LWS) will be avoided by the selection of a trenchless crossing technique e.g. HDD, a small section will be affected by the construction of a temporary Haul Road crossing. Reinstatement of the LWS will be required under consultation from ERYC and the Yorkshire Wildlife Trust.
Bentley Moor Wood (LWS)	Ancient & semi-natural woodland and deciduous woodland priority habitat.	Wholly within the Onshore Development Area, within the Onshore Substation Zone. The layout of Onshore Converter Stations and associated compounds have been designed to avoid direct impacts on this LWS. This LWS has been screened in for assessment on potential changes to air quality as detailed in **Volume 7, Chapter 26, Air Quality (application ref: 7.26).**
Swine Moor (LWS)	Mosaic of grassland and wetland habitats.	Adjacent (<0.01km) to an access road and a TCC within the Onshore Development Area, on the opposite side of the road. If required, appropriate mitigation such as dust suppression techniques would be implemented at this location.
Catwick - Seaton Road (LWS)	Good quality important hedgerow	Adjacent (<0.01km) to the Onshore Development Area, at the opposite side of the road.

231. As outlined in **Table 18-14** Bentley Moor Wood LWS is located wholly within Onshore Substation Zone however the layout of the Onshore Converter Station(s) and the associated compounds have been designed to avoid any direct impacts on this site (see **Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4)** for further details). Potential temporary changes to air quality originating from cumulative air emissions of additional construction vehicles on the road network, that could result in impacts to a section of ancient woodland in Bentley Moor Wood have been indicated within **Volume 7, Chapter 26, Air Quality (application ref: 7.26).** The results of the air quality assessment suggest a <1% increase in Nitrogen deposition for all traffic scenarios (In Isolation, Concurrently or Sequentially) when only the Projects traffic is considered, and >1% for all traffic scenarios when Projects traffic is considered in-combination with traffic growth and cumulative traffic. When levels above the 1% critical load threshold is reached, further assessment on designated sites should be considered. However, the increase to the lower and upper critical load for Nitrogen deposition is only 1.8% and 1.2% respectively which is not considered a significant increase. Given that impacts are temporary, relate to peak construction movement emissions and would not be continuous throughout the construction period. It should also be noted that background levels of nitrogen deposition are already in exceedance at Bentley Moor Wood LWS, due to regular baseline traffic movements at locations where the air quality assessment was undertaken.

232. Raventhorpe Embankment LWS is partially located within the Onshore Development Area. At this site, the implementation of HDD or other trenchless technique will prevent direct land-take impacts during the Onshore Export Cable installation. Indirect impacts would include an increase in noise levels from trenchless crossing techniques, and potential dust emissions.

233. Nunkeeling Lane and Beeford – Dunnington Road Verge LWS, are both located partially within the Onshore Development Area. Although most impacts to the LWS will be avoided by the selection of a trenchless crossing technique e.g. HDD, a small section will be affected by the construction of a temporary Haul Road crossing. Reinstatement of the LWS will be required under consultation from ERYC and the Yorkshire Wildlife Trust.

234. Swine Moor LWS and Catwick-Seaton Road LWS are located directly adjacent (<0.01km) to the Onshore Development Area, on the opposite side of the road. If required, appropriate mitigation such as dust suppression techniques would be implemented at this location. An appropriate distance between physical works and these local sites will be maintained to minimise potential impacts.

235. Despite the commitment to the embedded mitigation measures of avoidance, there would remain a risk of temporary indirect disturbance impacts (e.g., from dust or water pollution) to habitats and wildlife associated with these LWSs, which likely includes notable and/or protected species, such as nesting birds (possibly including WCA Schedule 1 species such as kingfisher and barn owl), bats, reptiles, otters, and water voles.

18.6.1.2.1 Magnitude of Impact – All Scenarios

236. For all scenarios (In Isolation, Concurrently or Sequentially) with embedded mitigation, the magnitude of impact is low as construction activities and potential Nitrogen deposition are unlikely to adversely affect the integrity or conservation status of the non-statutory designated sites and would only be experienced at a local level.

237. As the Projects will last for over a year the duration is classed as long-term.

18.6.1.2.2 Sensitivity of Receptor

238. In accordance with the criteria set out in **Table 18-9,** all non-statutory designated sites are of medium importance and therefore are medium sensitivity. Bentley Moor Wood LWS is high sensitivity as it is designated for ancient semi-natural woodland and deciduous woodland priority habitat.

18.6.1.2.3 Significance of Effect – All Scenarios

239. The principal mitigation measure for addressing impacts to non-statutory designated sites will be the embedded commitment for construction impacts to avoid these sites where possible, commitment to trenchless crossings techniques, and reinstating any affected LWS's habitats. All mitigation measures are included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application.

240. The magnitude of impact is low and sensitivity of receptor is medium. With the embedded mitigation the significance of effect to non-statutory sites is **minor** adverse, which is insignificant in EIA terms for all sites except Bentley Moor Wood LWS which is a high sensitivity LWS and therefore there are the potential for **moderate** adverse effects relating to Nitrogen deposition.

18.6.1.2.4 Mitigation and Residual Significance of Effect – All Scenarios

241. There will be additional mitigation measures that can be adopted to mitigate specific impacts following finalisation of the Onshore Export Cable Corridor and working practices. For LWSs this must include minimising any artificial lighting requirements of the nearby parts of the construction site, and/or careful design of any essential lighting nearby and agreed methodology of reinstatement of any sections directly affected by construction works with the ERYC and relevant stakeholders. If required, further measures such as maintaining appropriate buffer zones between the construction footprint and the LWSs would be implemented. Appropriate hydrological pollution prevention measures will also be adopted (as outlined in **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**). There may also be specific requirements from ERYC or other stakeholders that may add and/ or complement embedded mitigation measures.

242. These measures could further reduce the magnitude of impact from low to negligible therefore the residual effect is **negligible**, which is not significant in EIA terms. There is no additional mitigation proposed for the Bentley Moor Wood LWS, therefore, the potential significant effects relating to Nitrogen deposition will remain **moderate** adverse.

18.6.1.3 Impact 3: Temporary Loss/ Fragmentation of Habitats

243. The assessment herein provides a qualitative assessment of the potential effects during the construction phase upon habitats within the Onshore Development Area. A quantitative assessment of habitat biodiversity value and potential impacts during the construction phase is provided within **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10)**.

18.6.1.3.1 Wetland habitats – lowland fens and other swamps

244. The surveys identified one area of lowland fen within the Onshore Development Area. The lowland fen is classified as an irreplaceable habitat, regardless of the condition it is in. Trenchless crossing, such as HDD or other trenchless crossing technique, will be used to avoid any impacts on the lowland fen habitat. The Haul Road design has been amended from the PEIR to avoid any direct impacts on this habitat.

18.6.1.3.2 Woodland

245. The Onshore Export Cable Corridor avoids all areas of ancient woodland. There is a LWS designated for its ancient woodland (Bentley Moor Wood) and a further unnamed ancient woodland area within the Onshore Substation Zone. However, works associated with the Onshore Converter Station(s) will avoid direct impact on this woodland. Other woodlands surveyed included (following UK Hab v1 definitions) open grown trees, wet woodland, lines of trees, broadleaved - other broadleaved woodland types and mixed mainly broadleaved (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**).

246. Woodland blocks will not be directly impacted because trenchless techniques such as HDD will be used.

247. Although woodland priority habitats have been avoided, they may be indirectly affected by activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access).

248. Potential changes to air quality originating from air emissions of construction vehicles on the road network that could result in impacts to ancient woodland and deciduous woodland priority habitats located within the Bentley Moor Wood LWS have been indicated within **Volume 7, Chapter 26, Air Quality (application ref: 7.26)**. The results of the air quality assessment suggest a <1% increase in air pollutants (Nitrogen deposition for all traffic scenarios (In Isolation, Concurrently or Sequentially) when only project traffic is considered, and >1% for all traffic scenarios when project traffic is considered in-combination with traffic growth and cumulative traffic. Above the 1% critical load threshold, further assessment on designated sites should be considered, however the increase to the lower and upper critical load for Nitrogen deposition is only 1.8% and 1.2% respectively. This is not considered a significant increase given impacts are temporary and related to peak construction movements, so emissions would not be continuous throughout the construction period, this is also discussed in Impact 3, above. It should also be noted that background levels of nitrogen deposition are already in exceedance at Bentley Moor Wood LWS, due to regular baseline traffic movements at locations where the air quality assessment was undertaken.

249. Ancient woodlands are priority habitats and are of high sensitivity.

18.6.1.3.3 Maritime Cliff and Slope

250. The Landfall Zone is adjacent to a maritime cliff and slope priority habitat, which runs the length of the coastal cliffs. totalled 0.168ha of the Onshore Development Area **Appendix 18-2 Habitat Survey Report (Revision 2)** [PDC-004].

251. Trenchless crossings such as HDD will be used at the Landfall Zone. Therefore, the priority habitat is unlikely to be directly impacted by the works. However, it could be indirectly impacted from activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access) and vibration.

252. The long or short trenchless exit will result in exit pits, with three expected for the In Isolation Scenario and six for concurrently and sequential construction scenarios. The exit pits are to have an expected dimension of 20m x 10m x 3m (length x width x depth), they will be a minimum of 50m from the cliffs to ensure the stability of the beach cliffs (**Volume 7, Chapter 5, Project Description (application ref: 7.5)**).

253. As stated in **Chapter 5 Project Description** [APP-071] and shown on sheet 1 of the **Works Plan (Onshore) (Revision 3)** [PDA-003] and **Figure 5-3b of Chapter 5 Project Description** [APP-072], an emergency beach access may be required during construction and would be located to the north of Ulrome within an area of maritime cliff and slope habitat as identified on sheet 1 of Appendix C of **Appendix 18-2 Habitat Survey Report** []. This access would only be used in the event of a construction emergency, such as a frac-out, whereby drilling fluid is released to the ground surface during trenchless crossing installation.

254. Should the emergency access be required during construction, vehicles suitable to track on the beach would access the intertidal via a temporary access ramp and/ or ground protection matting shoreward of MHWS to avoid impacts on habitats. The cliff face at the proposed access location has eroded considerably since the habitat surveys were completed between May and November 2023. As this type of habitat is highly dynamic and constantly changing, the temporary access would be designed when the contractor is appointed. The design would take the current condition of the area into consideration and would, as a worst case, temporarily remain in place for the duration of the drilling works, expected to be up to 18 months.

255. Should a pre-construction habitat survey or ECoW identify the maritime cliff and slope habitat still be present at the start of construction, then it would be protected from any crossing vehicles with suitable ground protection matting and it would be monitored during construction to ensure the habitat is not damaged, as detailed in **Table 18-4**.

256. A Satellite Temporary Construction Compound, as shown on **Chapter 5 Project Description**, **Figure 5-3b** [APP-072], would also be located at the end of Turnpike Road adjacent to the existing boat storage area. This area of land would be returned to its current land use on completion of the works for the emergency beach access and would not impact the maritime cliff and slope habitat.

18.6.1.3.4 Beach

257. Beach totalled 14.37ha (3.14%) of the Onshore Development Area, extending from the western edge of the Marine Cliff and Slope habitat down to the MLWS, where terrestrial habitat ends and the marine environment starts (**Appendix 18-2 Habitat Survey Report (Revision 2)** [PDC-004]).

258. The access route to the north of the Onshore Development Area is to be used for emergency access only, such as health and safety incidents. No equipment is to be taken along this route as all equipment is to arrive via boat.

259. Trenchless crossings such as HDD will be used at the Landfall. The long or short trenchless exit will result in exit pits, with three expected for the In Isolation Scenario and six for concurrently and sequential scenarios. The exit pits are to have an expected dimension of 20m x 10m x 3m (length x width x depth), they will be a minimum of 50m from the cliffs (**Volume 7, Chapter 5, Project Description**).

18.6.1.3.5 Agricultural Land

260. The majority of the area within the Onshore Development Area is agricultural land and arable field margins (86.41%) (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**).

261. Agricultural land does support some wildlife including ground-nesting birds such as skylark and other terrestrial animals. Arable habitat soils are heavily disturbed through ploughing and application of fertilisers, herbicides, and other ground treatments, so disturbance to the soils is expected to be less ecologically impactful than at other habitats where soils have been less disturbed.

262. Some arable field margins are considered priority habitats, these areas are typically managed for wildlife and typically comprise diverse strips of grasses and forbs. They are a component of field boundaries which provide ecologically important linear features (typically in combination with features such as hedgerows, trees, and ditches) within arable landscapes. This habitat is of medium or low sensitivity; any better-established, larger, more florally diverse and better ecologically connected margins are of medium sensitivity, whereas more ephemeral, smaller, less florally diverse and ecologically isolated margins are of low sensitivity.

263. The Onshore Development Area crosses multiple parcels of agricultural land. There will be permanent habitat loss within the Onshore Substation Zone as well as temporary habitat loss from trenched crossings for the Onshore Export Cable Corridor. The habitat could also be subject to indirect effects due to activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access) and trenched crossings.

18.6.1.3.6 Grassland

264. The footprint of the Onshore Development Area passes through several grasslands, totalling 7.19% of the habitats. These grasslands have been identified as neutral grassland, other neutral grassland, *Arrhenatherum* neutral grassland, and modified grassland.

265. There could be direct impacts due to temporary habitat loss from the construction of the Onshore Export Cable Corridor. In areas of temporary loss, the habitat will be reinstated. The habitat could also be subject to indirect effects due to activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access).

266. Although the reinstatement of habitat to its baseline condition will not result in substantial changes due to the proposed works, it is possible that disturbance to grassland soils could result in some germination of plant species other than those which dominate the baseline condition; this could improve structural and/or floral diversity. Once management of the grassland (such as grazing) recommences following completion of installation and reinstatement of the soils, the grasslands would be expected to return to baseline conditions within no more than a few years. Other neutral grassland, *Arrhenatherum* neutral grassland, and modified grassland are therefore of low sensitivity. This process could take longer for neutral grassland as these typically have a botanically and structurally more varied sward, so these grasslands are of medium sensitivity.

18.6.1.3.7 Hedgerows

267. A total of 16,927m of hedgerow are present within the Onshore Development Area and 632m of lines of trees. There is a total of 4,160m of hedgerows that qualify as "ecologically important" under the Hedgerow Regulations 1997 across the areas that have been surveyed to date (**Appendix 18-2 Habitat Survey Report (Revision 2)** [PDC-004]).

268. Where possible trenchless crossings such as HDD will be used to prevent loss and impacts on the hedgerows. However, temporary removal of hedgerow habitat will be required in some areas, in the majority of cases, gaps will not exceed 24m of removal along the Onshore Export Cable Corridor and up to 34m for the Onward Cable Connection to the Proposed Birkhill Wood National Grid Substation. Additionally, there may be individual circumstances where an average of 25m is required to allow for visibility splays or for other access requirements as shown in **DCO Plans, Tree Preservation Order and Hedgerow Plan (Revision 4)** [REP1-003]. Where possible hedgerows within visibility splays would be limited to pruning rather than hedgerow removal. This will result in a temporary loss of the habitat itself but will also temporarily reduce the ecological function of hedgerows, which may provide ecologically important habitats and linear connections within the wider landscape.

269. The habitat could also be subject to indirect effects due to activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access).

270. Based on the average hedgerow loss associated with visibility splays and access, loss due to off-route haul road, the Onshore Export Cable Corridor and any TCCs, the total estimated hedgerow loss as a result of the Projects, concurrent or sequentially would be approximately 5,592m. This calculation is subject to amendment at the detailed design stage when further micro siting and refinement of the design would be expected.

18.6.1.3.8 Heathland and shrub

271. This included bramble, hawthorn and mixed scrub and amounted to 0.533ha (0.12%) of the Onshore Development Area.

272. If any temporary habitat loss of these areas is required, this would have minimal impact. However, vegetation clearance should be kept to a minimum and the habitat reinstated after the works.

18.6.1.3.9 Watercourses

273. The Onshore Export Cable Corridor crosses the following Main Rivers:

- Stream Dyke;

- Monk Dyke;
- Meaux and Routh East Drain;
- Holderness Drain;
- River Hull;
- Beverley and Barnston Drain; and
- Catchwater Drain.

274. Trenchless crossing techniques such as HDD are embedded in the design for all Main Rivers. Although ground disturbance will occur at the trenchless entry and exit points, there would be no direct disturbance to the watercourses crossed using trenchless techniques. Therefore, there is no direct mechanism for impacts to occur to the geomorphology, hydrology, and physical habitats of these watercourses.

275. The Onshore Export Cable Corridor also crosses ordinary watercourses including drains which may be crossed using a trenchless or open cut trenching method. The work will not impede the flow and the drain will be restored when works are completed. A crossing agreement will be agreed with the relevant authorities (**Table 18-4**). Further information is provided in **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**.

18.6.1.3.10 Other Habitats

276. Road verges amounted to 1.594ha, 0.35% of the Onshore Development Area. These areas are considered as modified grasslands.

277. Urban habitats including developed land, sealed surfaces, buildings, artificial unvegetated unsealed surface, and other developed land all have a negligible ecological value and are of negligible sensitivity.

18.6.1.3.11 Summary of Impacts

278. The potential impacts to all habitats as a result of the Projects include the following:

- Temporary habitat disturbance and fragmentation from the constriction of the Onshore Export Cable and Landfall Zone will occur to agricultural land, grasslands and hedgerows;
- Risk of pollution incident and sedimentation to watercourses from construction activities adjacent to rivers and streams; and
- Indirect effects due to activities which generate fugitive emissions (i.e. dust and emissions from an increase in construction traffic and road access), noise disturbance from increased traffic, and trenched crossings.

- Dust pollution.

279. Direct disturbance to priority habitat, such as lowland fen, would be avoided, where possible, through the use of trenchless crossing, such as HDD. Where this is not possible some priority habitat located along field boundaries will need to be temporarily removed for temporary construction access.

280. All habitats temporarily lost, such as sections of hedgerows, will be reinstated on completion of the constructions works.

18.6.1.3.12 Magnitude of Impact – All Scenarios

281. For all scenarios (In Isolation, Concurrently or Sequentially) where there is temporary habitat loss and/ or fragmentation, the magnitude of impact is negligible to low with the mitigation measures set out in **Table 18-4** and discussed below. This indicates that there would be no permanent effects on the affected habitat, or the species that it supports.

282. For the concurrent and sequential construction scenarios, there will be 24m of hedgerow removal at a crossing compared to the 15m In Isolation Scenario. Similarly, for all other habitats, a maximum width of 75m of temporary habitat loss is expected in the concurrent and sequential construction scenarios compared to 41m in the In Isolation Scenario. This assessment has considered both Projects being constructed the worst case scenario. However, due to the surrounding habitats being similar to those that will be lost within the Onshore Development Area, the magnitude of impact is not expected to change between the construction scenarios where there is temporary habitat loss and/ or fragmentation.

18.6.1.3.13 Sensitivity of Receptor

283. Lowland fen is a priority habitat and is classed as irreplaceable, reflecting its ecological importance. Therefore, it is of a high sensitivity. Other swamps are of a medium sensitivity, reflecting that the habitats have some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten year period.

284. Woodland is an ecologically valued habitat of high sensitivity which has a long recovery period (in some cases hundreds of years) following any damage or destruction. Individual open grown trees and the 'line of trees' are also considered part of the woodland broad habitat type and are of high sensitivity.

285. Maritime cliffs and slope are a priority habitat reflecting their ecological importance. In general, they are of medium sensitivity.

286. Beach is of low sensitivity. Indicating the receptor is unaffected and therefore the receptor can completely avoid the impact or adapt to it with no detectable change.

287. Cropland/ arable fields are of low sensitivity and are not an ecologically valued habitat due to their high levels of disturbance/management, monoculture vegetation and homogenous vegetation structure.

288. The sensitivity of arable field margins in areas of temporary loss is high, as they are a priority habitat.

289. Grassland is of medium sensitivity, indicating the habitat can tolerate the effect but does experience some detectable change.

290. All of the hedgerows have been considered priority habitat (as per UKHab v1.1, 2020) and 26% of which qualified as important under the Hedgerow Regulations 1997, reflecting their ecological importance. In general, they are of high sensitivity.

291. Heathland and shrub is of medium sensitivity, indicating the habitat can tolerate the effect but does experience some detectable change.

292. Watercourses within the Onshore Development Area are of medium to high sensitivity depending on if they are a main river priority habitat or a smaller stream or ditch.

293. Road verges are modified grasslands and are of low sensitivity.

294. Developed land sealed surface, buildings, artificial unvegetated unsealed surface, and other developed land all have a low sensitivity.

18.6.1.3.14 Significance of Effect – All Scenarios

Temporary habitat disturbance and fragmentation from the construction of the Onshore Export Cable and Landfall Zone would be of a low magnitude of impact, with the embedded mitigation measures set out in **Table 18-4** to reinstate the arable land, which makes up the majority of the Onshore Export Cable Route and is of low sensitivity and value. Therefore, the significance of effect would be **minor** adverse which is not significant in EIA terms.

295. Grassland habitats are of medium sensitivity and Beach habitats are of low sensitivity, therefore the significance of effect, considering a low magnitude of impact during construction would be **minor** adverse which is not significant in EIA terms. These habitats only make up approximately 7.19% and 3.14%) % of the Onshore Development Area, respectively and would be fully reinstated following construction and within two years if located between Jointing Bays.

296. Where habitats of high sensitivity are located within the Onshore Development Area and would be temporarily disturbed by the construction of the Onshore Export Cable and Landfall Zone, the magnitude of impact would be low and the significance of effect would be **moderate adverse** which is significant in EIA terms. However, this would be limited to relatively small areas of line of trees, high value arable field margins, hedgerows (classed as priority habitat as discussed in section 18.6.1.3.7 above) and a small area of eroding maritime cliff and slope habitat at the emergency beach access. As described in **Table 18-4** the Applicants have committed to reducing hedgerow removal at all crossings and hedgerows, line of trees and priority habitat field margins would be fully reinstated following construction as outlined in the **Outline Landscape Management Plan (OLMP) (Revision 3)** [document reference 8.11]. High sensitivity lowland fen, woodland blocks and heathland and shrub habitats have been completely avoided through the use of trenchless crossing techniques such as HDD and therefore there would be no direct impacts. The maritime cliffs and slope habitat has been avoided at the Landfall Zone though the use of a trenchless crossing technique. However, there may be a requirement to temporarily disturb the habitat for the construction of the emergency beach access. As set out in **Table 18-4** any maritime cliff and slope habitat present would be subject to ground protection i.e. temporary matting and monitored during the construction period.

297. The Applicants are committed to avoiding all high sensitivity open grown trees and trees within hedgerows within the Onshore Development Area, where possible as outlined in **Table 18-4**.

298. As detailed in **Table 18-4**, a detailed Arboriculture Impact Assessment (AIA) has been undertaken, and any trees that cannot be avoided would be replaced and secured within the **OLMP (Volume 8, application ref: 8.11)**.

299. For the In Isolation construction scenario there will be less temporary habitat loss. This assessment has been undertaken assuming the worst case scenario that both Projects are constructed. However, due to the surrounding habitats being similar, to those that will be lost, the magnitude of impact is not expected to change between the construction scenarios, as they are not rare habitats within the surrounding landscape. Therefore, the significance of effect will remain the same for all construction scenarios.

300. Watercourses are of high value and sensitivity, pollution or sedimentation could be of high magnitude impact but, with the embedded and standard mitigation measures set out in **Table 18-4** the magnitude of impact to watercourses from construction would be reduced to negligible adverse and the significance of effect would be **minor adverse** which is not significant in EIA terms. Mitigation measures include the development of a Surface Water Management Plan, as set out in the **OCoCP (Volume 8, application ref: 8.9)** which would ensure any water discharged to watercourses was first passed through a sediment / siltation trap and pollution interceptor and hydrological pollution prevention measures as outlined in the **Appendix D, Outline Pollution Prevention Plan** of the **OCoCP (Volume 8, application ref: 8.9)**. There will be no direct impact on Main Rivers, where trenchless crossing such as HDD will be used. Where ordinary watercourses are to be open cut, other embedded mitigation measures, including the agreement of a crossing method statements, which would consider pollution measures with the relevant stakeholders such as the Environment Agency, Internal Drainage Board (IDB) or ERYC will be employed.

301. Fugitive emissions including dust Pollution would be a negligible magnitude of impact taking into account the mitigation measures in **Table 18-4** including the standard mitigation measures for dust control set out in the **OCoCP (Volume 8, application ref: 8.9)**. Most habitats potentially affected by changes to air quality from dust are of medium sensitivity, however, priority habitats such as lowland fen, main rivers and ancient woodlands are of high sensitivity. A negligible magnitude of impact on these high importance receptors represents a temporary of **minor** adverse significance of effect during the construction period, which is not significant in EIA terms.

302. The results of the air quality assessment suggest there could be an indirect significant effect on ancient woodland located within at the Bentley Wood LWS from Nitrogen deposition associated with construction traffic. There is less than a <1% increase in the critical load of Nitrogen deposition when only traffic from the Projects is considered, and >1% when traffic from the Projects is considered in-combination with traffic growth and cumulative traffic. Above the 1% critical load threshold, further assessment on designated sites should be considered, however the increase to the lower and upper critical load for Nitrogen deposition is only 1.8% and 1.2% respectively/. This is not considered a significant increase given impacts are temporary and related to peak construction movements so emissions would not be continuous throughout the construction period. However, given the high sensitivity of the ancient woodland and as assessed in Impact 3, the significance of effect is **moderate** adverse. It should also be noted that

background levels of nitrogen deposition are already in exceedance at Bentley Moor Wood LWS, due to regular baseline traffic movements at locations where the air quality assessment was undertaken.

18.6.1.3.15 Mitigation and Residual Significance of Effect – All Scenarios

303. Temporarily lost habitats will be reinstated or allowed to naturally regenerate once the construction works have been completed. This would depend on the botanical interest and habitat types that have been temporarily lost.

304. Mitigation measures will seek no net loss of habitat biodiversity and net gains where possible. Full details of this are provided in **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10)**.

305. These measures will reduce the magnitude of impact from on lines of trees, high value arable field margins and hedgerows from low to negligible therefore the residual effect is **minor** adverse, which is not significant in EIA terms.

306. No additional mitigation is proposed for Nitrogen deposition on the ancient woodland priority habitat identified in the air quality assessment at Bentley Moor Wood, therefore the residual significance of effect remain **moderate** adverse.

18.6.1.4 Impact 4: Potential Mortality, Harm or Disturbance to GCN, or Destruction, Damage, or Disturbance to GCN Habitat

307. A total of 72 ponds within the 250m zone of influence (ZoI) of the Onshore Development Area and a further 54 ponds outside the ZoI but with potential good connectivity (**Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**) were identified during desk surveys. The locations of the ponds identified can be seen in **Volume 7, Figure 18-5 (application ref: 7.18.1)**. Of the ponds subject to eDNA analysis, 11 returned a positive result indicating GCN presence. Forty-nine ponds returned negative results indicating the likely absence of GCN. The full results can be seen in **Volume 7, Appendix 18-3 Great Crested Newt Report (application ref: 7.18.18.3)**.

308. The potential impacts to GCN as a result of the Projects include the following:

- Risk of killing or injuring foraging GCNs during the construction phase; and
- Temporary terrestrial habitat and / or pond loss for the duration of the onshore construction works.

18.6.1.4.1 Magnitude of Impact – All Scenarios

309. For all scenarios (In Isolation, Concurrently or Sequentially), with embedded mitigation considered, there will be short term impacts on GCN. The magnitude of the impact is therefore medium in the absence of additional mitigation, indicating that the potential impacts are unlikely to adversely affect GCN and amphibian integrity or conservation status.

18.6.1.4.2 Sensitivity of Receptor

310. Overall, the sensitivity of GCN is medium, reflecting that the species has some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten year period.

18.6.1.4.3 Significance of Effect – All Scenarios

311. Overall, without additional mitigation the magnitude of impact is medium, and the sensitivity of receptor is medium. Therefore, the significance of the effect is of **moderate** adverse significance without mitigation which is significant in EIA terms. As the Projects will last for over a year the duration is classed as long term.

18.6.1.4.4 Mitigation and Residual Significance of Effect – All Scenarios

312. Natural England have confirmed that a District Level Licence (DLL) application approach is satisfactory (Discretionary Advice Service response, 16/03/2022). DLL is an alternative approach to EPS mitigation licensing for developments which could affect great crested newts. DLL aims to increase the number of great crested newts by providing new or better habitats in targeted areas to benefit their wider population.

313. These additional mitigation measures will reduce the magnitude of impact from medium to low therefore the residual effect is **minor** adverse, which is not significant in EIA terms.

18.6.1.5 Impact 5: Potential Mortality, Harm or Disturbance to Badger, or Destruction, Damage, or Disturbance to Badger Habitat

314. The surveys identified nine badger setts within 30m of the Onshore Development Area. This included four outlier setts, one annex sett, one possible main sett, and three subsidiary setts. The results of the surveys can be seen in **Volume 7, Appendix 18-4 Badger Report – Confidential (application ref: 7.18.18.4)**.

315. The potential impacts to badger as a result of the Projects include the following:

- Temporary habitat loss for foraging and commuting badger for the duration of the construction phase;

- Permanent exclusion of badger from setts; and
- Risk of injuring or killing badger during the construction phase.

18.6.1.5.1 Magnitude of Impact – All Scenarios

316. For all scenarios (In Isolation, Concurrently or Sequentially) main and annex setts have been located within the Onshore Development Area and will need to be destroyed. The magnitude of the impact is therefore medium in the absence of mitigation, indicating that the potential impacts are unlikely to adversely affect badger integrity or conservation status.

18.6.1.5.2 Sensitivity of Receptor

317. The sensitivity of badger is medium, reflecting that the species has some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten year period.

18.6.1.5.3 Significance of Effect – All Scenarios

318. Overall, in absence of mitigation, the magnitude is medium, the sensitivity is medium. Therefore, the significance of the effect is of **moderate** adverse significance without mitigation which is significant in EIA terms. As the Projects will last for over a year the duration is classed as long term.

18.6.1.5.4 Mitigation and Residual Significance of Effect – All Scenarios

319. All additional mitigation measures are included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application.

320. A pre-construction survey for badger will need to be carried out as new badger setts can be created at any time within the Onshore Development Area. This information would also be useful to inform any derogation licence application.

321. A mesh covering must be used on the topsoil storage in areas surrounding badger hotspots to ensure badgers in the vicinity do not dig into the soil storage area and create additional setts during the construction phase. In the worst case scenario, trenches would be open for six years. If further badger setts are identified more areas of topsoil storage will need to be meshed.

322. A possible main and annex badger sett have been identified within the Onshore Development Area. This will require:

- Main sett replacement and closure under licence;
- A replacement sett must be in place six months in advance of closure of an existing sett, and badgers must have used the artificial sett;
- Sett closure can only occur between 1 July and 30 November (inclusive);

- As a main sett has been identified proof of use of the artificial sett is required prior to closure of the main sett; and
- Bait marking surveys may be required to ensure the artificial sett is not being built in another clan's territory.

323. As outlier and subsidiary badger setts have been identified within 30m of the Onshore Development Area. This will require:

- Prevention of disturbance to the setts within 30m of the Onshore Development Area.

324. These measures would reduce the magnitude of impact from medium to low therefore the residual effect is **minor** adverse, which is not significant in EIA terms.

18.6.1.6 Impact 6: Potential Mortality, Harm or Disturbance to Roosting Bats, or Destruction, Damage, or Disturbance to Roosting Bat Habitat

325. Based on the data provided by NEYEDC (**Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2)**) and the species identified in bat surveys undertaken to date **(Volume 7, Appendix 18-2 Habitat Survey Report (application ref: 7.18.18.2))** species potentially present in the Onshore Development Area are Daubenton's bat, whiskered bat, Natterer's bat, noctule, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, and parti-coloured bat. Other species may also be present but not yet been recorded.

326. The surveys to date have identified 48 trees with potential to support multiple roosting bats, 34 of these have the potential to be impacted by the Projects. The trees are located across the Ground Level Tree Assessment Survey Area, with the majority in and around the Onshore Converter Station area (**Volume 7, Appendix 18-5 Bats Report - Ground Level Tree Assessment (Revision 2) (application ref: 7.18.18.5)**). Of the 34 trees, which have the potential to be impacted by the Projects, and located within the Onshore Development Area, seven were found to be of high potential to support roosting bats, 17 of moderate potential and 10 of low potential. 21 of these trees would be avoided by the use of trenchless crossing techniques, which will avoid direct impact to possible roosts in five trees considered to be of high potential, 12 of moderate and four of low potential to support roosting bats. This would result in potential impacts to two high potential trees, five moderate potential trees and six low potential trees to support multiple roosting bats. These are identified in Appendix B of **Appendix 18-5 Bats Report - Ground Level Tree Assessment (Revision 2)** [PDC-005].

327. Many of the trees considered to be potential bat roosts are located in and around Bentley Moor Wood, in the Onshore Converter Station area, that will be protected from direct impact as part of the embedded mitigation.

18.6.1.6.1 Magnitude of Impact – All Scenarios

328. Roosting bats could be within the Onshore Development Area. The potential impacts to roosting bats as a result of the Projects include the following:

- Risk of killing or injuring roosting bats during the onshore construction phase;
- Risk of noise, light and vibration disturbance to roosting bats during the onshore construction phase; and
- Permanent loss of roosting features in the Onshore Development Area.

329. For all scenarios (In Isolation, Concurrently or Sequentially) any bat roosts within trees inside the Onshore Development Area will need to be removed. It is not known precisely which trees will be indirectly or directly impacted by the works as further pre-construction surveys are expected to inform the process as part of the embedded mitigation measures. However, in the worst case scenario, all features identified in section 18.6.1.6 will have roosts, with every tree being removed. Therefore, as a minimum, this will have a medium magnitude of impact. This will need to be reviewed once further pre-construction surveys have been completed and information on confirmed roosts and species present.

18.6.1.6.2 Sensitivity of Receptor

330. Given that only a small proportion of potential bat roosts across the landscape is relevant to the Projects (e.g. 19 trees in total), the sensitivity of roosting bats is medium, reflecting that the species has some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten year period.

331. The number of trees lost will vary for each construction scenario. However, the difference in amount of trees suitable for bats to be lost will not affect the sensitivity value of roosting bats.

18.6.1.6.3 Significance of Effect – All Scenarios

332. Overall, with embedded mitigation included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application, the magnitude of impact is medium, and the sensitivity of receptor is medium. Therefore, the significance of the effect is of **moderate** adverse significance, which is significant in EIA terms.

18.6.1.6.4 Mitigation and Residual Significance of Effect – All Scenarios

333. Additional mitigation would be in the form of EPS mitigation licence for bats in the event of a roost being identified within any of the tree features following pre-construction surveys. The licence application process will fully assess the impacts and determine relevant mitigation according to roost type, species and number of bats affected.

334. These measures will reduce the magnitude of impact to low as well as the residual significance of effect to **minor** adverse, which is not significant in EIA terms.

18.6.1.7 Impact 7: Potential Mortality, Harm or Disturbance to Foraging and Commuting Bats, or Destruction, Damage, or Disturbance to Foraging and Commuting Bat Habitat

335. A number of native and important within the Onshore Development Area are anticipated to be cut, trimmed or coppiced as a result of the works and associated visibility displays around access routes. Therefore, hedgerows withing the Onshore Development Area will be temporarily lost as a result of the proposed works. Therefore, foraging and commuting habitat for bats would be potentially temporarily lost in the Onshore Development Area. The full plan of temporary hedgerow removal detailing all the crossing types can be seen in **Volume 7, Appendix 5-2 Obstacle Crossing Register (application ref: 7.5.5.2)**.

336. At least eight species have been recorded foraging and commuting within the Onshore Study Area (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). The rarity of species within the assemblage was assessed using the Bat Mitigation Guidelines (Reason and Wray, 2023). Common pipistrelle, soprano pipistrelle and brown long-eared bats are considered 'widespread' within the Northern England region (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). Whiskered/Brandt's bat, Daubenton's bat, Natterer's bat and noctule are considered 'widespread in many geographies, but not as abundant in all', and Leisler's bat and Nathusius' pipistrelle are considered to be 'rarer or restricted distribution' (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**). No Annex II species, such as Bechstein's bat *Myotis bechsteinii*, persist in this region, and therefore where bats have been identified to genus level only, this would not include these rarer species (**Volume 7, Appendix 18-6 Bats Report - Monthly Activity Transects (application ref: 7.18.18.6)**).

337. The potential impacts to foraging and commuting bats as a result of the Projects include the following:

- Risk of noise, light and vibration disturbance to foraging and commuting bats during the construction phase;
- Temporary foraging and commuting habitat loss for the duration of the Onshore construction phase; and
- Permanent foraging and commuting habitat loss.

338. The removal of section of hedgerows are expected to be on average 24m for access and 25m where visibility splays at road intersections are required. The temporary loss will impact 47 native hedgerows and 67 ecologically and historically important hedgerows. The scenarios habitat loss rages vary, for the Onshore Export Cable Corridor this is 15m (In Isolation) and 24m (Concurrent and Sequential). For the Onward Cable Route this is 20m (In Isolation) and 34m (Concurrent and Sequential). Cleared areas will be re-instated after the works, except where permanently lost within the Substation Zone.

18.6.1.7.1 Magnitude of Impact – All Scenarios

339. The magnitude of the impact is low taking into account the embedded mitigation proposed in **Table 18-4**, including reduced width of hedgerow removal, maintenance of existing flight routes and sympathetic construction lighting. The magnitude of impact is the same across all construction scenarios. This indicates that the potential impacts are unlikely to have an adverse effect on the integrity of the conservation status of a species or species assemblage.

18.6.1.7.2 Sensitivity of Receptor

340. Assuming hedgerows acting as flight paths only have 15-34m removed per hedgerow, the sensitivity of foraging and commuting bats is medium. Indicating the receptor has some ability to tolerate this effect but does experience a detectable change.

341. The length of hedgerow habitat lost will vary for each construction scenario. However, the difference in amount of hedgerow lost will not affect the sensitivity value of foraging and commuting bats.

18.6.1.7.3 Significance of Effect – All Scenarios

342. Overall, the magnitude of impact is low, and the sensitivity of receptor is medium. therefore, the significance of effect is **minor** adverse, which is not significant in EIA terms.

18.6.1.7.4 Mitigation and Residual Significance of Effect – All Scenarios

18.6.1.7.5 The potential significance of effect is **minor** adverse, which is deemed to be not significant in EIA terms. Therefore, no additional mitigation is required.

18.6.1.8 Impact 8: Potential Mortality, Harm or Disturbance to Breeding Birds, or Destruction, Damage, or Disturbance to Breeding Bird Habitat

343. Over the eight transects, barn owl and marsh harrier were the only confirmed WCA Schedule 1 breeding bird species. Barn owl was also classed as probable and possible breeder on other transects. Cetti's warbler was classed as a probable and possible breeder. The breeding assemblages of the transects ranged from 43 to 54 species, averaging at 48 species, and the average percentage of BoCC within the transects was 52%.

344. In the worst case scenario, there will be temporary habitat loss to breeding birds as a result of the Projects. Hedgerows will be restored following construction. The potential impact to breeding birds as a result of the Projects include the following:

- Risk of injuring and killing breeding birds during the construction phase
- Risk of noise, vibration and light disturbance to breeding birds during the construction phase; and
- Temporary breeding habitat loss for the duration of the onshore works.

18.6.1.8.1 Magnitude of Impact – All Scenarios

345. For concurrent and Sequential Scenarios WCA Schedule 1 breeding birds have been confirmed to be breeding, as well as being probable and possible breeders within the Onshore Development Area and will be impacted due to the works. Therefore, in the absence of mitigation, as embedded mitigation measures are not relevant for this receptor the magnitude of impact would be high. Indicating that the potential impacts are likely to have an adverse effect on the integrity of a site of the conservation status of a species or species assemblage.

346. For an In Isolation Scenario there will be less WCA Schedule 1 breeding birds habitat loss as a result of the works. Therefore, in the absence of additional mitigation the magnitude of impact would be medium. Indicating that the potential impacts are likely to have an adverse effect on the integrity of a site of the conservation status of a species or species assemblage.

18.6.1.8.2 Sensitivity of Receptor

347. As WCA Schedule 1 birds have been confirmed breeding, without additional mitigation, the sensitivity of breeding birds is high, reflecting that species is unable to tolerate effect resulting in permanent change in its abundance or quality.

18.6.1.8.3 Significance of Effect – All Scenarios

348. Overall, the magnitude of impact is high, and the sensitivity of receptor is high. Therefore, the significance of the effect is of **major** adverse significance without additional mitigation which is significant in EIA terms.

349. For the In Isolation construction scenario the magnitude of impact is medium, and the sensitivity of receptor is high. Therefore, the significance of the effect is of **major** adverse significance without additional mitigation which is significant in EIA terms.

350. As the Projects will last for over a year the duration is classed as long term.

18.6.1.8.4 Mitigation and Residual Significance of Effect – All Scenarios

351. All additional mitigation measures are included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application.

352. The removal of vegetation would be scheduled to avoid the breeding bird season (March – September inclusive) in order to negate potential disturbance of nesting birds. At locations where works could cause disturbance to nesting birds or if habitat clearance is required during the nesting season, a thorough inspection should be carried out by a suitably competent person, such as an ecologist or ornithologist, to check for the presence of active birds' nests prior to any disruptive activity. If active birds' nests are found, these would be retained in-situ, a buffer zone suitable to the relevant species would be established and allowed to reach their natural conclusion without being disturbed or damaged.

353. All felled sections of hedgerows, scrub or woodland along the cable corridor will be replanted.

354. A small number of ground nesting species were recorded during the bird surveys, this included lapwing in discrete locations. Measures should be put in place to ensure nests are not impacted upon, such as avoiding works in the area during the breeding season, this species is likely to re-use the same locations in successive years, therefore a check of known areas in February/March is prudent (**Volume 7, Appendix 18-8 Ornithology Breeding Bird Report (application ref: 7.18.18.8)**).

355. Sand martin *Riparia riparia* were recorded in the maritime cliff and slope habitat at the Landfall location. Works must start prior to the breeding season and alternative, artificial nesting locations provided if construction activities are expected to be undertaken during this period. Sand martins would then be monitored throughout the works at this location by a suitably qualified ornithologist. Artificial nesting boxes can be used in artificial cliffs or banks, the boxes are designed to replicate natural nesting. Deterrents can be set up prior to the breeding season, however they do not have a guaranteed success to deter sand martins from nesting.

356. In addition to the above, the following mitigation measures would be secured through the OEMP and employed:

- Pre-construction bird surveys would be undertaken to establish the presence of breeding birds;
- Areas of arable fields within that have the potential to support nesting birds would be managed prior to commencement of construction to deter birds which may seek to use this habitat for nesting. Such management measures may involve the clearance of ground cover (e.g. arable cover) to create unfavourable nesting conditions;
- Measures would be adopted to minimise noise, light and disturbance on identified breeding birds, such as visual screening (e.g., opaque fencing) where necessary;
- Construction activities would be monitored by an ECoW or suitably qualified ornithologist, who would seek to ensure compliance with the WCA by avoiding destruction of nests, eggs, or young, and affording increased protection from disturbance to WCA Schedule 1 species breeding birds;
- Where breeding bird activity is recorded, construction works (excluding vehicle and personnel movements) may be halted immediately until a disturbance risk assessment is undertaken by a suitably qualified ecologist. The risk assessment would consider the nature of construction activity, likelihood of disturbance, and possible implications of the construction activities on the breeding attempt and set out measures to ensure that no disturbance occurs. Where it is determined that breeding birds are not likely to be affected, construction works will continue. Where it is determined that breeding birds may be affected, additional mitigation works would be implemented to prevent disturbance. Where, in the opinion of the suitably qualified ecologist, disturbance to nesting birds cannot be avoided by mitigation, construction works surrounding

the area would be suspended until nesting is allowed to reach their natural conclusion without being disturbed or damaged; and

- Keeping the winter crop stubble within the arable land adjacent to the Works low during the bird breeding season (which is typically from March to August, although can commence earlier or later depending on the weather conditions) in order to minimise the chance of notable ground nesting birds nesting prior to work on arable land. If for any reason winter crop stubble is not kept low and should works commence within the bird breeding season (March - August inclusive), a pre-construction check for nesting birds would be undertaken at most 48 hours in advance of construction, and any nests identified would be protected and left undisturbed until the young have fledged.

357. It should be noted that if a breeding pair of any bird of prey is identified within or adjacent to the Onshore Development Area, these have larger exclusion buffer zones that vary for each species but are at least 200m from the nest site. Marsh harrier was confirmed as a breeder adjacent to the Onshore Development Area **(Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)** and the buffer zone can be at least 200m depending on activity but normally equal or greater than 500m.

358. These measures will reduce the magnitude of impact from high to low therefore the residual effect is **moderate** adverse**,** which is significant in EIA terms for all Construction Scenarios.

18.6.1.9 Impact 9: Potential Mortality, Harm or Disturbance to Over-wintering Birds, or Destruction, Damage, or Disturbance to Over-wintering Bird Habitat

359. Suitable habitat for over-wintering birds will be impacted as a result of the Projects. T1, T4, and T5 were important areas for over-wintering birds (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). None of the species were recorded in significant numbers when assessing as potential FLL to the SPA (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). The potential impacts to over-wintering birds as a result of the Projects include the following:

- Risk of injuring or killing over-wintering birds during the construction phase;
- Risk of noise, vibration and light disturbance to over-wintering bird species;

- Temporary habitat loss for the duration of the onshore construction works; and
- Permanent habitat loss.

18.6.1.9.1 Magnitude of Impact – All Scenarios

360. For all scenarios (In Isolation, Concurrently or Sequentially) over-wintering birds are present within the Onshore Development Area and will be impacted by the works. This would therefore be of medium magnitude. The impact adversely affects an ecological receptor but is unlikely to adversely affect its integrity or conservation status.

361. For the Concurrent and Sequential Construction Scenarios, there will be more hedgerow removal at a crossing compared to the In Isolation Scenario. This has been considered in the worst case scenario of both Projects being constructed. Due to the surrounding habitats being of similar the magnitude is not expected to change the magnitude of impact between the scenarios.

18.6.1.9.2 Sensitivity of Receptor

362. Overwintering birds have a medium sensitivity reflecting that species have some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten-year period.

18.6.1.9.3 Significance of Effect – All Scenarios

363. Overall, in absence of additional mitigation the magnitude of impact is medium, the sensitivity of receptor is medium. Therefore, the significance of the effect is of **moderate** adverse significance which is significant in EIA terms. As the Projects will last for over a year the duration is classed as long term.

18.6.1.9.4 Mitigation and Residual Significance of Effect – All Scenarios

364. All additional mitigation measures are included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application.

365. Where construction works are undertaken within suitable habitat or functionally linked habitat between November and January (weather and species dependent), a pre-construction survey will be undertaken to record the distribution and abundance of over-wintering birds and the distribution of suitable habitat likely to be affected during the winter season within which construction works will be undertaken. The findings of these pre-construction surveys will determine whether mitigation measures to reduce disturbance will be required. However, such mitigation measures may comprise pre-work habitat manipulation works to actively discourage bird species from using the fields where works are required and subsequently installing exclusion fencing to deter birds from the area as well as ensuring all lighting (if required) is only directed onto the construction works area.

366. During the construction works, should over-wintering birds be present, the ECoW will be responsible for advising on the appropriate levels of mitigation, e.g., watching briefs, toolbox talks to the construction personnel, etc.

367. Works and disturbances are to be minimised at Skipsea Beach and the River Hull as they had the highest concentrations of bird activity (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**). At Skipsea Beach, a maximum of six exit pits are expected to be used with the expected dimensions 20m x 10m x 3m (length x width x depth). These will be a minimum of 50m from the cliffs (**Volume 7, Chapter 5, Project Description (application ref: 7.5)**). The exit pits will contain an inert substance and will be washed into the sea naturally, and therefore no impacts to birds are anticipated. Any marine impacts are assessed in the relevant offshore chapters.

368. Woodland areas will be avoided and retained as well as smaller copses or tree groups, where present along the corridor. Many of the hedgerows and arable field margins, where present, provided resources to wintering birds on the site, it is understood that impacts to these habitats will be unavoidable. However, these will be re-instated once works within the Onshore Development Area are completed. This may provide an opportunity to enhance species composition in the hedgerows as well as infill any gaps (**Volume 7, Appendix 18-7 Ornithology Overwintering Report (application ref: 7.18.18.7)**).

369. Lighting, noise, and vibration would be controlled throughout the works.

370. If the level of overwintering birds increases over the Projects period, compared to what was identified during the original surveys, then the impact assessment must be reviewed, and a new mitigation plan implemented.

371. These measures will reduce the magnitude of impact from medium to low therefore the residual effect is **minor** adverse, which is not significant in EIA terms.

18.6.1.10 Impact 10: Potential Mortality, Harm or Disturbance to Otter, or Destruction, Damage, or Disturbance to Otter Habitat

372. Suitable habitat for otter will be temporarily lost as a result of the Projects. Currently, no otter holts have been identified on any of the watercourses surveyed and it is not expected that any holts will be impacted by the works. However, if any holts are identified during pre-construction surveys along watercourses where open cut crossing methodology is being proposed, then additional mitigation (and potentially a EPS mitigation licence) will be required. The potential impacts to otter as a result of the Projects include the following:

- Risk of injuring or killing otter during the construction phase;
- Risk of noise, vibration and light disturbance to otter; and
- Temporary habitat loss for the duration of the onshore construction works

18.6.1.10.1 Magnitude of Impact – All Scenarios

373. Direct holt loss is not expected as no otter holts have been identified. However, otter holts could be created at any time. Main River crossings are being proposed to be achieved by the use of trenchless techniques and are unlikely to affect otter holts. Similarly, ordinary watercourses using open cut methods are also unlikely to impact otter holts as none have been identified. However, if otter holts are identified during pre-construction surveys, then the impact and mitigation must be reviewed and may result in the need of an EPS mitigation licence for otter, where all mitigation would be determined. The magnitude of impact is therefore low taking these measures into account. The impact adversely affects an ecological receptor but would not adversely affect its integrity or conservation status.

374. The In Isolation Scenario uses only one drill or equivalent for a trenchless crossing however, this would not affect the magnitude of impact as no otter holts have been identified. If any are identified then the impact and mitigation must be reviewed, and a discussion with NE may be required as well as an EPS licence.

18.6.1.10.2 Sensitivity of Receptor

375. The sensitivity of otter is medium, reflecting that the species has some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a 10-year period.

18.6.1.10.3 Significance of Effect – All Scenarios

376. Overall, the magnitude is low, the sensitivity is medium. Therefore, the significance of the effect is of **minor** adverse significance without mitigation which is not significant in EIA terms. As the Projects will last for over a year the duration is classed as long term.

18.6.1.10.4 Mitigation and Residual Significance of Effect – All Scenarios

377. All additional mitigation measures are included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application.

378. In case otter holts are found within the Onshore Development Area during the construction phase, then a derogation licence would be sought, and associated mitigation strategy followed.

379. These measures will maintain the magnitude of impact as low therefore the residual effect is **minor** adverse, which is not significant in EIA terms.

18.6.1.11 Impact 11: Potential Mortality or Harm or Disturbance to other notable species.

380. No surveys were completed for hedgehog or brown hare. However, hedgehogs were recorded during bat surveys. Due to the habitats observed during the surveys brown hare are likely to also be using the Onshore Development Area.

381. The potential impacts to hedgehog and brown hare as a result of the Projects include the following:

- Temporary habitat loss for foraging and commuting hedgehog and brown hare for the duration of the construction phase; and
- Risk of injuring or killing hedgehog and brown hare during the construction phase.

18.6.1.11.1 Magnitude of Impact – All Scenarios

382. For all scenarios (In Isolation, Concurrently or Sequentially) taking into account the embedded and standard mitigation measures in **Table 18-4**, including pre-construction surveys, ECoW and minimal amount of vegetation clearance, the magnitude of impact is low. The low magnitude of impact adversely affects an ecological receptor but would not adversely affect its integrity or conservation status.

18.6.1.11.2 Sensitivity of Receptor

383. The sensitivity of hedgehog and brown hare is medium, reflecting that the species has some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a 10-year period.

18.6.1.11.3 Significance of Effect – All Scenarios

384. Overall, with embedded mitigation measures included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application, magnitude of impact is low, the sensitivity of receptor is medium. Therefore, the significance of effect is **minor** adverse, which is not significant in EIA terms.

18.6.1.11.4 Mitigation and Residual Significance of Effect – All Scenarios

385. The potential significance of effect is **minor** adverse, which is deemed to be not significant in EIA terms. Therefore, no additional mitigation is required.

18.6.1.12 Impact 12: Potential Mortality, Harm or Disturbance to Reptile, or Destruction, Damage, or Disturbance to Reptile Habitat

386. Suitable habitat for reptile will be temporarily and permanently lost as a result of the Projects. The potential impacts to reptile species as a result of the Projects include the following:

- Risk of injuring or killing reptiles during the construction phase;
- Risk of noise, vibration and light disturbance to reptiles;
- Temporary habitat loss for the duration of the onshore construction works; and
- Permanent habitat loss.

18.6.1.12.1 Magnitude of Impact – All Scenarios

387. For all scenarios (sub optimal habitat, likely a low population) in the PEIR worst case scenario was assumed. In renewing the habitat surveys, the habitats on site are mostly suboptimal as they are open agricultural fields. Reptiles are still likely to be present in the Onshore Development Area in more suitable habitats such as field margins, rough grassland, hedgerows and woodland edge. Therefore, there is likely a small to medium population of the more common species of reptiles concentrated in certain areas.

388. Habitats will be suitable to sustain low – medium population of reptile species and small areas of habitat will be permanently lost. with the embedded and standard measures included in **Table 18-4** including phased habitat clearance, ECoW and habitat manipulation, this would be reduced to a low magnitude of impact.

18.6.1.12.2 Sensitivity of Receptor

389. The sensitivity of reptiles is medium, reflecting that all likely species have some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten-year period.

18.6.1.12.3 Significance of Effect – All Scenarios

390. The magnitude of impact is low and the sensitivity of the receptor is medium. Therefore, the significance of the effect is of **minor** adverse significance which is not significant in EIA terms. As the Projects will last for over a year the duration is classed as long term.

18.6.1.13 Impact 13: Potential Mortality, Harm or Disturbance to Water Vole, or Destruction, Damage, or Disturbance to Water Vole Habitat

391. Suitable habitat for water vole will be disturbed because of the Projects. Direct habitat loss is not expected where trenchless crossing techniques such as HDD will be used. Where open cut crossings of ordinary watercourse or ditches are proposed, as detailed in **Volume 7, OCR (application ref: 7.5.5.2)**, water vole habitat could be impacted.

392. Out of the 81 watercourses surveyed eight watercourses had evidence of water vole identified during the surveys. Six of these ditches were clustered north of Beverley, either side of the River Hull crossing (**, Appendix 18-9 Water Voles and Otters Report (Revision 2)** [document reference 7.18.18.9]). The potential impacts to water vole as a result of the Projects include the following:

- Risk of injuring or killing water vole during the construction phase;
- Risk of noise, vibration and light disturbance to water vole; and
- Temporary habitat loss for the duration of the onshore construction works.

18.6.1.13.1 Magnitude of Impact – All Scenarios

393. For all scenarios (In Isolation, Concurrently or Sequentially), where water vole presence and burrows have been identified, these areas are unlikely to be disturbed as part of the proposed works. This is due to the use trenchless crossing techniques within the Onshore Export Cable Corridor. There are two known crossings, WX-043A and WX-043B of South Bullock Dike, which would require an off-route haul road crossing by culvert in a ditch with optimal suitability and water vole presence. These crossings are however at a greater distance from the location where evidence of water vole has been recorded and would be too far to be considered a source of disturbance to the species.

394. The magnitude of the impact is therefore low, taking into account the embedded and standard mitigation in **Table 18-4** including that the works will be set back at least 20m from main rivers and 9m from ordinary watercourses. This magnitude of impact indicates the impact will adversely affect an ecological receptor but is unlikely to adversely affect its integrity or conservation status.

18.6.1.13.2 Sensitivity of Receptor

395. The sensitivity of water vole is medium, reflecting that the species has some ability to tolerate the potential impacts and could potentially recover to an acceptable status over a ten-year period.

18.6.1.13.3 Significance of Effect – All Scenarios

396. With the embedded mitigation in place, the magnitude of impact is low, and the sensitivity of the receptor is medium. Therefore, the significance of the effect is of **minor** adverse significance which is not significant in EIA terms. As the Projects will last for over a year the duration is classed as long term.

18.6.1.13.4 Mitigation and Residual Significance of Effect – All Scenarios

397. All additional mitigation measures are included in the **OEMP** (Revision 4) [document reference 8.10] that is submitted with the DCO application. It is possible that water voles are detected at new locations during pre-construction surveys, in this case, any mitigation measures not already embedded in the design must be secured and relevant derogations licences obtained if required.

398. This measure will maintain the current magnitude of impact as low together with the resulting residual effect of **minor** adverse, which is not significant in EIA terms.

18.6.1.14 Impact 14: Spread of Non-native Species

399. The areas of the Onshore Development Area surveyed in 2022 identified three species of INNS plants outside of the Onshore Development Area. No INNS species were identified in the areas surveyed during the 2023 habitat surveys. However, INNS plant species could be found within the Onshore Development Area at any time.

400. No INNS are a valued ecological receptor. However, INNS requires consideration as the Onshore Export Cable works risk furthering the spread of this species (which would represent a negative ecological impact and an offence being committed).

401. INNS, such as Himalayan balsam, can outcompete native vegetation, thereby reducing species diversity of plants and animals where it becomes established. As a result, when Himalayan balsam dies back over winter, it can leave the banks of watercourses largely un-vegetated and therefore more vulnerable to erosion. Removal of the species can be difficult, expensive, and time-consuming, typically requiring a persistent approach over 5 to 10 years. Consequently, the establishment of this species can result in extensive and long-lasting adverse ecological impacts.

18.6.1.14.1 Magnitude of Impact – All Scenarios

402. In the absence of mitigation in all scenarios (In Isolation, Concurrently or Sequentially) construction works and construction vehicles and personnel could be working in proximity to areas that support INNS. Without the adoption of careful control / prevention measures, this could have a permanent negative impact on affected habitats and native species where it becomes newly established, which is likely to comprise valued habitats such as watercourses and could impact protected species. The magnitude of impact is therefore high.

18.6.1.14.2 Sensitivity of Receptor

403. As INNS are covered under the WCA Schedule 9, they do not have a sensitivity value.

18.6.1.14.3 Significance of Effect – All Scenarios

404. As there is no sensitivity value, there is no significance of effect. However, mitigation is still required to prevent the spread of these species.

18.6.1.14.4 Mitigation and Residual Significance of Effect – All Scenarios

405. All additional mitigation measures are included in the **OEMP (Volume 8, application ref: 8.10)** that is submitted with the DCO application. Control of invasive species, where required, would be incorporated into the OEMP for the Projects to provide mitigation.

406. Prior to the commencement of construction works, an INNS Management Plan would be developed for approval by the relevant stakeholders. This plan will likely include the following measures:

- A plan of all INNS locations and extents;
- A protocol for removing INNS and/ or managing the waste generated;
- All machinery to be cleaned and inspected prior to working on the Onshore Development Area, as biosecurity measure to prevent to introduction of any INNS species;

- Good site practice measures for managing the spread of INNS during works at watercourses; and
- A requirement for an ECoW and details of their responsibilities with respect to INNS.

18.6.2 Potential Effects During Operation

18.6.2.1 Impact 15: Disturbance to Habitats and Species from Maintenance Activities

407. Planned maintenance at the Onshore Converter Stations or routine access and maintenance at link boxes along the Onshore Export Cable Corridor is anticipated to be localised with a minimal likelihood of disturbance expected to the adjacent habitats and species.

408. In the event of a cable failure there may be a need to access the buried cables to enable the replacement of a failed cable section. Such reactive repairs are expected to have potential impacts similar to those of construction. However, they would be expected to be more localised, of smaller scale and temporary in nature.

18.6.2.1.1 Magnitude of Impact – All Scenarios

409. In all scenarios (In Isolation, Concurrently or Sequentially) maintenance works would cause a short term and temporary impact on the habitats and species adjacent to the works. The magnitude of impact is therefore low taking into account embedded and standard mitigation measures in **Table 18-4** to be applied during any maintenance works including ECoW where necessary, awareness of bird nesting season and minimal vegetation clearance. This magnitude of impact indicates that the impact adversely affects the receptor but would not adversely affect its integrity or conservation status.

18.6.2.1.2 Sensitivity of Receptor

410. The sensitivity of the receptor will depend on what species or habitats are affected by the maintenance works. In the worst case the sensitivity would be high assuming impacts, for example, on WCA Schedule 1 birds or irreplaceable habitats (such as ancient woodland or lowland fen). Indicating it is unable to tolerate the effect and there is a permanent change in its abundance or quality.

18.6.2.1.3 Significance of Effect – All Scenarios

411. As impacts on sensitive habitats have been avoided through embedded mitigation during the construction phase, it is expected that the same approach would occur during operation for maintenance activities. Overall, with embedded and standard mitigation, the magnitude of impact is low, and in the worst case scenario the sensitivity of receptor is high. Therefore, the significance of the effect is of **moderate** adverse significance, which is significant in EIA terms.

18.6.2.1.4 Mitigation and Residual Significance of Effect – All Scenarios

412. It is possible that additional mitigation may be required for protected species, such as derogation licences or working under restricted timeframes, which would reduce the magnitude of impact to negligible, resulting in an overall significance of effect **minor** adverse, which is deemed to be not significant in EIA terms.

18.6.2.2 Impact 16: Disturbance to Species from Artificial Lighting

413. During operation of the Onshore Converter Stations, there will be no requirement for continuous lighting and therefore disturbance impacts on species is not predicted. However, temporary lighting may be required during maintenance.

414. Permanent light at the Onshore Converter Stations has been designed to be directed inwards and provided only to essential areas of the site such as key routes and building entrances. This would produce minimal levels of overspills and help maintain dark corridors along key ecological features during the operation phase such as hedgerows and ancient woodland.

18.6.2.2.1 Magnitude of Impact – All Scenarios

415. If the Onshore Converter Stations require temporary artificial lighting this would be short term with the embedded and standard mitigation set out in **Table 18- 4** in place, including restriction on night-time working and use of directional and low-level lighting to reduce additional light spill into retained and adjacent habitats the magnitude of impact is low. Indicating that the impact adversely affects the receptor but would not adversely affect its integrity or conservation status.

18.6.2.2.2 Sensitivity of Receptor

416. The sensitivity of the receptor will depend on what species are affected by the maintenance works. In the worst case the sensitivity would be medium such as commuting/ foraging bats and nesting birds.

18.6.2.2.3 Significance of Effect – All Scenarios

417. Apart from embedded mitigation in the OEMP, further mitigation measures are given in the **Design and Access Statement (Volume 8, application ref: 8.8)** that is also submitted with the DCO application. Overall, with standard and embedded mitigation, for temporary lighting the magnitude of impact is low, and in the worst case scenario the sensitivity of receptor is moderate. Therefore, the significance of the effect is of **minor** adverse significance without mitigation which is significant in EIA terms.

18.6.2.2.4 Mitigation and Residual Significance of Effect – All Scenarios

418. The potential significance of effect is **minor** adverse, which is deemed to be not significant in EIA terms. Therefore, no additional mitigation is proposed.

18.6.2.3 Impact 17: Permanent Habitat Loss

419. As presented in section 18.5.1 the main habitat type in the Onshore Development Area is cropland. This is of low ecological value due to the homogeneity of the habitat alongside intensive farming practices and the presence of herbicides and pesticides. The construction of the Onshore Converter Stations associated landscaping works and Link Boxes along the Onshore Export Cable Corridor will result in permanent habitat loss and will mostly affect agricultural land.

420. Hedgerows that intersect with Onshore Converter Station and Substation Access Roads will be permanently lost. This is expected to total 400m of native hedgerow within the Onshore Converter Station footprint and 31m of native hedgerow within the associated permanent access road footprint.

18.6.2.3.1 Magnitude of Impact – All Scenarios

421. For all scenarios, the habitat loss for permanent structures, such as Onshore Converter Stations and access roads, would be long term. Considering the low ecological value of the habitats and that the vast majority of the surrounding areas is of the same habitat type that will not be affected, the magnitude of impact is negligible when considering the embedded mitigation measures. The **OEMP (Volume 8, application ref: 8.10)**, and particularly the **OLMP (Volume 8, application ref: 8.11)**, set out to retain habitat connectivity where possible and to replace lost habitat as close to the Onshore Development Area as possible. As most habitats to be permanently lost are cropland, of low sensitivity and ecological interest and new native species rich hedgerow and new areas of woodland will be planted in the Substation Zone, the embedded mitigation measures would result in minimal effect on the ecological receptors.

18.6.2.3.2 Sensitivity of Receptor

422. The sensitivity of the receptor will depend on what habitat is being affected by the permanent habitat loss. In the worst case the sensitivity would be high e.g. native hedgerows and hedgerow trees.

18.6.2.3.3 Significance of Effect – All Scenarios

423. Overall, with embedded mitigation, the magnitude of impact is negligible, and in the worst case scenario the sensitivity of receptor is high. Therefore, the significance of the effect is of **minor** adverse significance which is not significant in EIA terms.

18.6.2.3.4 Mitigation and Residual Significance of Effect – All Scenarios

424. The potential significance of effect is **minor** adverse, which is deemed to be not significant in EIA terms. Therefore, no additional mitigation is proposed.

18.6.2.4 Impact 18: The Effect of Permanent Habitat Loss on Species

425. Results from species specific surveys are presented in section 18.5.4. A range of species have been identified utilising the Onshore Development Area. As opposed to the Onshore Export Cable Corridor, the main effect of permanent habitat loss on species would be within the Onshore Converter Station Zone, an area that proved to support bats, breeding and overwintering birds.

426. As presented in section 18.5.1 the main habitat type in the Onshore Development Area is cropland. This is of low ecological value due to the homogeneity of the habitat alongside intensive farming practices and the presence of herbicides and pesticides. The construction of the Onshore Converter Station(s), Link Boxes and above ground manhole covers along the Onshore Export Cable Corridor will result in permanent habitat loss and will mostly affect agricultural land.

427. Hedgerows that intersect with Onshore Converter Station and Substation Access Roads that are known to support bird and bat species will be permanently lost. This is expected to total 400m of native hedgerow within the Onshore Converter Station footprint and 31m of native hedgerow within the associated permanent access road footprint.

18.6.2.4.1 Magnitude of Impact – All Scenarios

428. For all scenarios, the habitat loss for permanent structures, such as Onshore Converter Stations and access roads, would be long term. Considering the low ecological value of the habitats and that the vast majority of the surrounding areas is of the same habitat type that will not be affected, the magnitude of impact is low when considering the embedded mitigation measures. The **OEMP (Volume 8, application ref: 8.10)**, and particularly the **OLMP (Volume 8, application ref: 8.11)**, set out to retain habitat connectivity where possible and to replace lost habitat as close to the Onshore Development Area as possible. As most habitats to be permanently lost are cropland, of low sensitivity and ecological interest and new native species rich hedgerow and new areas of woodland will be planted in the Substation Zone, the embedded mitigation measures would result in minimal effect on the ecological receptors.

18.6.2.4.2 Sensitivity of Receptor

429. The sensitivity of the receptor will depend on what species is being affected by the permanent habitat loss. In the worst case, such as a bat maternity roost or a Schedule 1 species of bird nesting on the ground or in an affected tree within the Onshore Converter Stations footprint, the sensitivity would be high.

18.6.2.4.3 Significance of Effect – All Scenarios

430. Overall, with embedded mitigation, the magnitude of impact is low, and in the worst case scenario the sensitivity of receptor is high. Therefore, the significance of the effect is of **moderate** adverse significance without additional mitigation which is significant in EIA terms.

18.6.2.4.4 Mitigation and Residual Significance of Effect – All Scenarios

431. Considering that impact on species can be reduced through additional measures that may include derogation licences and bespoke habitat creation strategies (such as installation of bat boxes, additional tree planting on/ offsite, planting of specific species of trees/ shrubs/ wildflowers), the magnitude of impact can be further reduced from low to negligible therefore the residual effect is **minor** adverse, which is not significant in EIA terms.

18.6.3 Potential Effects During Decommissioning

432. No decision has been made regarding the final decommissioning policy for the Onshore Export Cables, as it is recognised that industry best practice, rules and legislation change over time. It is likely that the cables would be pulled through the ducts and removed, with the ducts themselves left in situ.

433. In relation to the Onshore Converter Stations, the programme for decommissioning is expected to be similar in duration to the construction phase. The detailed activities and methodology would be determined later within the project lifetime. Any such methodology and associated mitigation would be agreed with the relevant authorities and statutory consultees through a decommissioning plan in accordance with the requirements of the **Draft DCO (Volume 3, application ref: 3.1)**. The detailed activities and methodology are expected to include:

- Dismantling and removal of outside electrical equipment from site located outside of the Onshore Converter Stations' buildings;
- Removal of cabling from site;
- Dismantling and removal of electrical equipment from within the Onshore Converter Stations' buildings;
- Removal of main Onshore Converter Stations' buildings and minor services equipment;
- Demolition of support buildings and removal of fencing;
- Landscaping and reinstatement of the site (including land drainage); and
- Removal of areas of hard standing.

434. Whilst details regarding the decommissioning of the Projects are currently unknown, considering a worst case scenario, which would be the removal and reinstatement of the current land use, it is anticipated that the impacts would be similar or less than those during construction.

435. The same potential impacts noted for construction are therefore expected to be scoped in (and out) for decommissioning.

18.7 Potential Monitoring Requirements

436. Onshore monitoring requirements are described in the **OEMP (Volume 8, application ref: 8.10)**. Onshore monitoring requirements, where required are described further in this chapter and would be further developed and agreed with stakeholders prior to construction taking account of the final detailed design of the Projects.

437. Hedgerows that are re-instated would be monitored once a year for a minimum of five years post construction to ensure that the hedgerow has fully established as described in the **OLMP (Volume 8, application ref: 8.11)**. If it has not, then remediation works should be undertaken to ensure that it is achieved, including the replanting failed plants.

438. Populations of overwintering (October to February) and breeding birds (March to September) should be monitored throughout the construction period as it is possible there will be a change in population sizes over time. For example, overwintering bird roosts may increase in size, and new species may utilise the habitats within and surrounding the Onshore Development Area. The Projects in all scenarios must ensure that if populations change the mitigation is reassessed and altered where appropriate, for example acoustic barriers and appropriate buffer zones.

439. An ECoW will need to check for the presence, spread from adjacent land or introduction of any INNS during pre construction surveys. If they arise within the Onshore Development Area, appropriate course of actions according to the species in question must be taken in order to control spread and/ or avoid establishment.

440. If EPS mitigation licenses for any species reviewed within this report are obtained, then monitoring will be required as part of licence conditions. In most cases, the monitoring would be very focused, such as to the relevant trees (in the case of roosting bats where replacement bat roosting sites have been created) or the monitoring of newly constructed badger setts. Any monitoring requirements will be outlined within the relevant species' licences.

441. Should compensatory features be required for EPS as part of licence conditions, then ecological monitoring during, and post construction would be required in order to confirm the effectiveness of mitigation measures described above. As a minimum, ecological monitoring for the scheme would comprise:

- Bat boxes installed will be monitored during and post construction as part of the bat mitigation on site, this will include checking their condition and clearing them out as well as for presence of roosting bats;
- Bird boxes installed will be monitored during and post construction as part of the bird mitigation on site, this will include checking their condition and clearing them out as well as monitoring their use by birds;
- Monitoring the establishment of any new shrubs, trees and other plants created as part of mitigation for habitat loss;
- Monitoring the populations of all species that require specific surveys and mitigation; and
- Ensuring eradication of any INNS species if identified in a works area if they would need to be disturbed. If they are not in the works area, then an appropriate cordon depending on species must be implemented.

442. Any monitoring requirements in regard to BNG are discussed within **Volume 7, Appendix 18-10 Biodiversity Net Gain Strategy (application ref: 7.18.18.10)**.

18.8 Cumulative Effects Assessment

443. Cumulative effects can be defined as incremental effects on that same receptor from other proposed and reasonably foreseeable schemes and developments in combination with the Projects. This includes all schemes that result in a comparative effect that is not intrinsically considered as part of the existing environment and is not limited to offshore wind projects.

444. The overarching method followed in identifying and assessing potential cumulative effects is set out in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** and **Volume 7, Appendix 6-1 Onshore Cumulative Assessment (application ref: 7.6.6.1)**. The approach is based upon the Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (PINS 2017). The approach to the CEA is intended to be specific to the Projects and takes account of the available knowledge or the environment and other activities around the Onshore Development Area.

445. The CEA has followed a four-stage approach developed from the Planning Inspectorate Advice Note Seventeen. These stages are set out in Table 6-1-2 of **Volume 7, Appendix 6-1 Onshore Cumulative Assessment (application ref: 7.6.6.1).** Stage four of this process, the CEA assessment is undertaken in two stages. The first step in the CEA is the identification of which residual impacts assessed for the Projects on their own have the potential for a cumulative impact with other plans, projects and activities. This information is set out in **Table 18-15** which sets out the potential impacts assessed in this chapter and identifies the potential for cumulative effects to arise, providing a rationale for such determinations. Only potential impacts assessed as negligible or above are included in the CEA. Those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact.

Table 18-15 Potential Cumulative Impacts

Impact	Potential for Cumulative Effects	Rationale
Construction		

Impact	Potential for Cumulative Effects	Rationale
Impact 1: Construction Disturbance to Statutory Designated Nature Conservation Sites.	Yes	Plans and projects currently in planning have potential to have cumulative indirect effects on onshore designated sites where zones of influence overlap.
Impact 2: Construction Disturbance to Non-Statutory Designated Nature Conservation Sites.	Yes	Plans and projects currently in planning have potential to have cumulative indirect effects on onshore designated sites where zones of influence overlap.
Impact 3: Permanent and Temporary Loss / Fragmentation of Habitats	Yes	Plans and projects currently in planning have potential to have cumulative permanent habit loss across the region as well as cumulative temporary habitat disturbance where projects are carried out simultaneously.
Impact 4: Potential Mortality, Harm or Disturbance to GCN, or Destruction, Damage, or Disturbance to GCN Habitat	Yes	Any project with a risk to GCN will either be required to manage risks and compensate habitats through the District Level Licencing Scheme or the Natural England EPS licensing route. Therefore, the likelihood of a cumulative effect is low.
Impact 5: Potential Mortality, Harm or Disturbance to Badger, or Destruction, Damage, or Disturbance to Badger Habitat	Yes	Any project with a risk to badger will be required to manage risks and compensate loss of setts through the Natural England licensing route. Therefore, the likelihood of a cumulative effect is low.
Impact 6: Potential Mortality, Harm or Disturbance to Roosting Bats, or Destruction, Damage, or Disturbance to Roosting Bat Habitat	Yes	Any project with a risk to bats will be required to manage risks and compensate loss of roosts through the Natural England EPS licensing route. Therefore, the likelihood of a cumulative effect is low.

Impact	Potential for Cumulative Effects	Rationale
Impact 7: Potential Mortality, Harm or Disturbance to Foraging and Commuting Bats, or Destruction, Damage, or Disturbance to Foraging and Commuting Bat Habitat	Yes	Plans and projects currently in planning have potential to have cumulative permanent habit loss across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.
Impact 8: Potential Mortality, Harm or Disturbance to Breeding Birds, or Destruction, Damage, or Disturbance to Breeding Bird Habitat	Yes	Plans and projects currently in planning have potential to have cumulative permanent habit loss across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.
Impact 9: Potential Mortality, Harm or Disturbance to Over-wintering Birds, or Destruction, Damage, or Disturbance to Over-wintering Bird Habitat	Yes	Plans and projects currently in planning have potential to have cumulative permanent impacts across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.
Impact 10: Potential Mortality, Harm or Disturbance to Otter, or Destruction, Damage, or Disturbance to Otter Habitat	Yes	Plans and projects currently in planning have potential to have cumulative permanent habit loss across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.
Impact 11: Potential mortality or harm or disturbance to other notable species	Yes	Plans and projects currently in planning have potential to have cumulative permanent habit loss across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.
Impact 12: Potential Mortality, Harm or Disturbance to Reptile, or Destruction, Damage, or Disturbance to Reptile Habitat	Yes	Plans and projects currently in planning have potential to have cumulative permanent habit loss across the region as well as cumulative temporary direct and indirect disturbance where projects are carried out simultaneously.

Impact	Potential for Cumulative Effects	Rationale
Impact 13: Potential Mortality, Harm or Disturbance to Water Vole, or Destruction, Damage, or Disturbance to Water Vole Habitat	Yes	Any project with a risk to water vole will be required to manage risks and compensate loss of setts through the Natural England licensing route. Therefore, the likelihood of a cumulative effect is low.
Impact 14: Spread of Non-native Species	Yes	Each project individually comes with a risk of spreading Non-native Species but there will no movement of construction vehicles between project sites, therefore the likelihood of a cumulative effect is low.
Operation and Maintenance		
Impact 15: Disturbance to Habitats and Species from Maintenance Activities	Yes	Plans and projects currently in planning have potential to have ongoing cumulative temporary direct and indirect disturbance if maintenance activities are undertaken simultaneously.
Impact 16: Disturbance to Species from Artificial Lighting	Yes	Plans and projects currently in planning have potential to have ongoing cumulative effects from lighting where this is installed.
Impact 17: Permanent habitat loss	Yes	Plans and projects currently in planning have potential to have ongoing cumulative permanent direct and indirect disturbance if permanent habitat loss is of the same habitat type and/or affects the same protected species utilising the habitats.
Decommissioning		

Impact	Potential for Cumulative Effects	Rationale
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, cumulative effects during the decommissioning phase are assumed to be the same as those identified during the construction phase.		

446. The second stage of the CEA is a project specific assessment of the potential for any significant cumulative effects to arise due to the construction and/or operation and maintenance of the Projects. To do this, a short list of schemes for CEA has been produced relevant to terrestrial ecology and ornithology following the approach outlined in **Volume 7, Appendix 6-1(application ref: 7.6.6.1).** The second phase of this assessment is only undertaken if the first phase identifies that cumulative effects are possible.

447. The CEA has been based on information available on each potential scheme (e.g. as set out on the East Riding of Yorkshire Council and Hull City Council planning portals and the Planning Inspectorate Website) as of January 2024. It is noted that the other scheme details available may change in the period up to construction or may not be available in detail at all. The assessment presented here is therefore considered to be conservative, with the level of impacts expected to be reduced compared to those presented here.

448. A total of 12 schemes have been identified for inclusion on the short list of projects to be assessed cumulatively for terrestrial ecology and ornithology. Schemes that have not been considered as resulting in likely cumulative significant effects for terrestrial ecology and ornithology as there are no ecological residual impacts and therefore no potential for cumulative impacts.

449. Summary information on the short list schemes progressing through this exercise (i.e. the short list of other schemes) for assessment on terrestrial ecology and ornithology is provided below in **Table 18-16**. This presents the scenarios whereby the Projects and the other schemes/developments that have been identified on the short list of schemes screened for terrestrial ecology and ornithology, as listed in **Table 18-16**, could potentially result in cumulative effects for onshore terrestrial ecology and ornithology.

Table 18-16 Short List of Schemes Considered Within the Terrestrial Ecology and Ornithology Cumulative Effects Assessment

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Dogger Bank A & B Offshore Wind Farm	1	The onshore construction period for Dogger Bank A and B completed in 2023. The scheme will be in operational phase during the Projects' construction phase. This scheme had ecological impacts assessed and suitable mitigation recommended for the construction phase and no residual impacts were anticipated. Similar result applies to the decommissioning phase. For the operational and maintenance phases, minor to moderate beneficial impacts are expected.	No cumulative effects expected.
A164 and Jocks Lodge Improvement Scheme	1	The main works for the Jock's Lodge improvement scheme commenced on 08 January 2024 and is expected to complete by the end of 2026. There could be an overlap of construction phases if the Onshore element of the Projects start in 2026 No clear information is available on residual impacts but information on some receptors are available and detailed below. NE commented that no impacts on designated sites are expected as part of this project. A protected species report indicates minor adverse impact on five species of foraging/ commuting bats associated with	Due to overlapping construction phases and impacts on some similar receptors and the scale of the project, cumulative effects may be likely. The cumulative effects on breeding birds have been assessed as **moderate** adverse.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		hedgerow removal. No impacts are expected on roosting bats. No impact on GCN or reptiles are expected. Effects on foraging/ commuting bats (temporary habitat loss and direct disturbance), and hedgerows (habitat fragmentation and temporary loss) could be cumulative if construction phases overlap. Because of overlapping ZoIs and the current outcome form assessment of the Projects, the effects arising from potential simultaneous habitat displacement and disturbance to breeding birds during the construction phase (and possibly decommissioning if this overlaps), cumulative effects are expected on this receptor.	
Creyke Beck Solar Farm	1	For this scheme there are no significant negative effects upon protected and notable species during construction phase. Residual effects are envisaged to be either significant and positive or not to be significant. The residual effects of the scheme are considered to be positive for habitats.	No cumulative effects expected.
Tickton Bridge Solar	1	For this scheme residual impacts are either absent, not significant or are minor positive.	No cumulative effects expected.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Hornsea 4 Offshore Wind Farm	1	The construction phase overlaps with the Projects and also another similar scheme, SEGL2, detailed below. Areas where cumulative effects may rise during the construction phase are likely to be along the sections of the Onshore Export Cable Corridor of both schemes are in close proximity. In the construction phase, minor adverse impacts were identified for bats, breeding birds, overwintering birds, otter, water vole, GCN, badgers. There may be cumulative effects for species with overlapping ZoI such as overwintering birds and foraging/ commuting bats through temporary disturbance and habitat loss. Because of overlapping ZoIs and the current outcome form assessment of the Projects, the effects arising from potential simultaneous habitat displacement and disturbance to breeding birds during the construction phase (and possibly decommissioning if this overlaps), cumulative effects are expected on this receptor. There may be cumulative impact on hedgerows (temporary loss and habitat fragmentation). No impacts on same designated sites were identified. In the operational phase, maintenance activities were identified as having a minor adverse residual impact on some protected species. Similar to the	Due to overlapping construction phases, the scale of this project and interaction with other similar schemes, impacts on same receptors cumulative effects are likely. No cumulative effects during the operational phase are expected. Effects during the decommissioning phase impacts are likely to be cumulative if the scheme impacts on same species or habitats. The cumulative effects on breeding birds have been assessed as **moderate** adverse.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		decommissioning phases, effects may be cumulative if they overlap with the Projects'.	
Scotland England Green Link 2 (SEGL2)	2	The construction period of this scheme is due to overlap with the Projects as construction work is planned to commence in 2024 with the new connection due to be operational in 2029. Areas where cumulative effects may rise during the construction phase are likely to be the sections of the Onshore Export Cable Corridor of both schemes are closest and may also be affected by the construction of Hornsea 4 Offshore Wind Farm scheme. In the construction phase, minor adverse impacts were identified for some ecological receptors such as semi-natural woodland and trees, hedgerows (species rich/ important) roosting bats, overwintering birds, otter, water vole, GCN, badgers. Potential cumulative effects on species with overlapping ZoIs such as commuting/ foraging and roosting bats, overwintering birds are possible, as well as for similar affected important habitats such as hedgerows. Because of overlapping ZoIs and the current outcome form assessment of the Projects, the effects arising from potential simultaneous habitat displacement and disturbance to breeding birds during the construction phase (and	Due to overlapping construction phases, the scale of this project and interaction with other similar schemes, impacts on same receptors cumulative effects are likely. The cumulative effects on breeding birds have been assessed as **moderate** adverse. No cumulative effects during the operational phase are expected. Effects during the decommissioning phase impacts are likely to be cumulative if this phase overlaps and impacts on same species or habitats.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		possibly decommissioning if this overlaps), cumulative effects are expected on this receptor. No impacts on same designated sites were identified.	
Ferry Road Carr Plantation	1	There are no residual impacts for this project for the construction phase as they were all assessed as negligible. For the operational phase residual impacts were either negligible – not significant or slight positive – not significant. There is no decommissioning phase for this project identified in the report.	No cumulative effects expected.
White Hall	3	An EIA screening report has identified the sensitive receptors, explained the potential effects of the scheme and concluded that no significant effects in EIA terms are predicted. No formal EIA is required as part of this projects.	No cumulative effects expected.
Proposed Birkhill Wood National Grid Substation	2	This proposed substation will connect to the Projects' Onward Cable Connection. No information is available on the East Riding of Yorkshire Council site. Planning is likely to be submitted later in 2024. Therefore, no assessment can be undertaken at this stage. Construction timings is not yet known. However, cumulative effects may occur during the construction phase as they are likely to overlap	**Moderate** adverse cumulative effects on breeding birds during the construction phase if they overlap.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		since the Project's Onward Cable Route will connect to this proposed substation.	
North Humber to High Marnham grid upgrade	2	The construction period of this scheme is planned to overlap with The Projects. Currently in pre submission stage, so no impact assessment or residual effects available.	Unknown
Creyke Beck Substation Extension	2	No information is available on the East Riding of Yorkshire Council site. Planning is likely to be submitted later in 2024. Therefore, no assessment can be undertaken at this stage. Construction timings is not yet known.	Unknown
JBM Peartree Hill Solar Farm	2	No impact EIA is available for this project. Therefore, no assessment can be undertaken at this stage	Unknown

450. The CEA for terrestrial ecology and ornithology has identified cumulative effects with Hornsea 4 Offshore Windfarm, the Jocks Lodge Development and SEGL2.

451. No significant Cumulative Effects (with other schemes) were identified in relation to terrestrial ecology and ornithology except for breeding birds during the construction phase of the Projects and Hornsea 4 Offshore Windfarm, Birkhill Wood National Grid Substation, Scotland England Green Link 2, A164 and Jock's Lodge Improvement Scheme, which were assessed as moderate adverse. The cumulative effects may also apply to the decommissioning phase if they overlap. The mitigation being proposed includes improved communication with neighbouring schemes as per the **OCoCP (Volume 8, application ref: 8.9)** to ensure that the construction programme reduces temporal and spatial impacts on breeding birds to minimise localised displacement and disturbance. With these measures in place it is likely that the cumulative effects would not increase but would remain as **moderate** adverse during the construction phase.

452. For schemes where no impact information is available yet, a cumulative assessment is not possible. The Projects will be mitigating to a level where the impacts are not significant, where possible. If residual impacts cannot be avoided, then the other schemes would have to address any cumulative impacts associated with the Projects.

18.9 Transboundary Effects

453. There are no transboundary effects with regard to terrestrial ecology and ornithology as the Onshore Development Area is not in proximity to any international boundaries. Transboundary effects are therefore scoped out of this assessment and not considered further.

18.10 Interactions

454. The effects identified and assessed in this chapter have the potential to interact with each other. The areas of potential interaction between effects are presented in **Table 18-17**. This provides a screening tool for which effects have the potential to interact. **Table 18-18** provides an assessment for each receptor (or receptor group) as related to these impacts.

455. Within **Table 18-18** the effects are assessed relative to each development phase to see if multiple effects could increase the significance of the effect upon a receptor. Following this a lifetime assessment is undertaken which considers the potential for effect to affect receptors across all development phases.

Table 18-17 Interactions Between Impacts - Screening

Potential Interactions Between Impacts					
Construction					
	Impact 1 Construction disturbance to statutory designated nature conservation sites	Impact 2 Habitat destruction or damage, or construction disturbance to non-statutory designated nature conservation sites	Impact 3 Loss of or damage to valued habitats	Impacts 4 -13 Potential mortality, harm or disturbance to protected species, or destruction, damage or disturbance to protected species' habitat	Impact 14 Potential spread of INNS
Impact 1 Construction disturbance to statutory designated nature conservation sites		Yes	Yes	Yes	Yes
Impact 2 Habitat destruction or damage, or construction disturbance to non-statutory designated nature conservation sites	Yes		Yes	Yes	Yes
Impact 3 Loss of or damage to valued habitats	No	Yes		Yes	Yes
Impacts 4 -13 Potential mortality, harm, or disturbance to protected species, or destruction, damage, or disturbance to protected species' habitat	No	Yes	No		Yes
Impact 14 Potential spread of INNS	No	Yes	No	No	
Operation					
	Impact 15: Disturbance to habitats and species from maintenance activities	Impact 16: Disturbance to species from artificial lighting	Impact 17 and 18: Impact to species and habitats from permanent habitat loss		
Impact 15: Disturbance to habitats and species from maintenance activities		Yes	Yes		
Impact 16: Disturbance to species from artificial lighting	Yes		Yes		
Impact 17and 18: Impact to species and habitats from permanent habitat loss	Yes	Yes			

Table 18-18 Interaction Between Impacts - Phase and Lifetime Assessment

Receptor	Highest Significance Level				
	Construction	**Operation**	**Decommissioning**	**Phase Assessment**	**Lifetime Assessment**
Designated Nature Conservation Sites	Minor adverse	Minor adverse	Minor adverse	No greater than individually assessed impact. The impacts have low magnitudes of effects on designated sites, with impact significances judged at no more than minor adverse during construction only. Given the low magnitudes and significances of the predicted impacts and effects, coupled with the avoidance / mitigation measures due to be adopted, and the anticipated absence of / limited potential for impacts during operation or decommissioning, there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.	No greater than individually assessed impact Impacts to designated nature conservation sites during operation are expected to be negligible, and during decommissioning impacts are expected to be equivalent or less than those predicted / assessed during construction. Therefore, impacts to designated sites would not combine over the lifetime of DBS East and DBS West to increase the significance level of any impacts.
Priority Habitats	Minor adverse	Minor adverse	Minor adverse	No greater than individually assessed impact. Notable impacts to valued habitats are only predicted during the construction and decommissioning phases; during operation priority habitats are expected to experience minor impacts. During decommissioning, any impacts to priority habitats are likely to be of no more than equivalent significances for priority habitats because the decommissioning footprint will likely be smaller, timeframes will likely be shorter, and impacts would be focused on those habitats which had previously been impacted during construction. It is possible that habitats which become established within the DCO order limits between construction and decommissioning would need to be cleared to accommodate decommissioning works, but the types of habitats which would become established between construction and decommissioning are, by their nature, quick to establish and therefore would be quick to recover post decommissioning. The most ecologically valued habitats are not expected to be impacted by decommissioning works because cabling / ducting is due to be extracted from in-situ Jointing Bays / inspection pits, rather than require extensive open-trench removal. Impacts significances during decommissioning are therefore judged to be of lower (or certainly of no greater) significances than are predicted during the construction phase. Given the	No greater than individually assessed impact. Notable impacts to valued habitats are only predicted during the construction and possibly during the decommissioning phases. Given the time delay between these two phases and the fact that the most valued/sensitive habitats are due to be avoided by decommissioning, there is no realistic potential for impacts to combine over the lifetime of the project and lead to levels of significance which would be greater than those assessed at individual (i.e. construction) phases. It is possible that some quickly regenerating habitats could experience cumulative impacts over the course of the Projects (if such a habitat becomes established within the decommissioning footprint), but the overall impact during the lifetime of the Projects would not be any more significant than during individual phases because these types of habitats would recover similarly quickly post decommissioning. The most ecologically valued habitats are not expected to be impacted by decommissioning works because cabling / ducting is due to be extracted from in-situ Jointing Bays / inspection pits, rather than require extensive open-trench removal. Impacts significances throughout the lifetime of the Projects

Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
				likely time delay between these two phases, no interactions resulting in greater impacts than are assessed individually are expected.	are therefore judged to be of no greater significances than are predicted during any one phase.
INNS (Potential spread of)	Minor adverse	Minor adverse	Minor adverse	No greater than individually assessed impact. The same preventative measures relating to INNS would need to be taken at decommissioning phase. Decommissioning works are expected to involve relatively minor works compared with construction meaning the risk of spreading INNS should be lower. However, it is possible that INNS will have spread relative to their status at construction phase, in which case the pre-mitigation impact during decommissioning could increase. However, assuming appropriate mitigation measures are adopted (in line with measures due to be adopted at the construction phase) there would be no realistic potential for interaction between impacts in various stages of the Projects.	No greater than individually assessed impact The same preventative measures relating to INNS would need to be taken at decommissioning phase as would be adopted during construction. Decommissioning works are expected to involve relatively minor works compared with construction meaning the risk of spreading INNS should also be lower. However, it is possible that INNS will have spread or become more established relative to their status at construction phase, in which case the pre-mitigation impact during decommissioning could increase. However, assuming appropriate mitigation measures are adopted (in line with measures due to be adopted at the construction phase) there would be no realistic potential for cumulative impacts through the lifetime of the Projects.
Protected and valued species	Moderate adverse (for breeding birds) Minor adverse for all other species	Moderate adverse (for breeding birds) Minor adverse for all other species	Moderate adverse (for breeding birds) Minor adverse for all other species	No greater than individually assessed impact. The construction phase is expected to have the most significant impacts and effects on protected and valued species due to the larger footprint and longer timeframes than other phases. In contrast, operational impacts are expected to have negligible impacts on protected and valued species, and decommissioning works (which would be of a smaller scale and shorter timeframe than construction) would not be expected to have impacts of greater magnitudes or effects of greater significance than construction. Furthermore, it is anticipated that relevant mitigation measures would be adopted during decommissioning (e.g., clearance of woody vegetation outside of the main nesting bird season), which further reduces the potential for inter-related impacts across multiple phases of the Projects.	No greater than individually assessed impact. Given the anticipated small footprint and short timeframe of decommissioning works relative to construction, there is no realistic potential for impacts to protected and valued species to cumulate over the lifetime of the Projects. It is conceivable that some of the same populations (e.g., of nesting birds, GCN or badgers, for example) could be impacted both during construction and again during decommissioning, but given the long period between these events, any combined impacts would be no greater than those assessed at individual phases. It is also anticipated that relevant mitigation measures for protected and valued species (in particular, measures which ensure legal offences are avoided, such as destruction of birds' nests, GCN habitat or badger setts, for example) would be adopted during decommissioning in the same manner they would be adopted during construction.

18.11 Inter-relationships

456. For terrestrial ecology and ornithology potential inter-relationships between other topics assessed within the ES include terrestrial ecology and ornithology. A summary of the potential inter-relationships between Marine Physical Environment, Flood Risk and Hydrology, Noise and Air Quality is provided in **Table 18-19**.

Table 18-19 Terrestrial Ecology Inter-relationships

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Construction			
Impacts on water dependent habitats and designated sites.	**Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**	Section 18.6	Potential change to ground conditions (including chemical quality and physical properties) during construction could affect the quality and quantity of groundwater and hydrologically connected surface water receptors which could in turn affect valued ecological receptors which rely on these water sources. This could include valued habitats (e.g., grasslands, rivers, and woodland).
Potentially kill, harm or disturbance to protected species or destruction, damage or disturbance to protected species' habitat. Impacts on protected and / or notable species from Changes in noise and	**Volume 7, Chapter 25 Noise (application ref: 7.25)**	Section 18.6	Construction activities will inevitably result in new sources of noise, ground vibration. These have the potential to impact nearby wildlife such as breeding birds, bats (roosting and non-roosting), amphibians, riparian mammals, badgers, invertebrates, and other terrestrial wildlife. It has been assumed that all construction works along the onshore cable corridor will be undertaken during daylight hours where possible and appropriate mitigation measures (e.g., temporary screening around working areas, use of silences and / or enclosures around noisy equipment) will be implemented. Where this is not

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
ground vibration during construction.			possible, appropriate mitigation measures will be implemented (e.g. use of directional lighting to prevent light spill). Mitigation measures will be implemented that will include turning off of plant when not in use, ensuring equipment is in good working order and installation of screening to further reduce noise levels where required.
Impacts on habitats through increased acid and nitrogen from machinery during the construction phase.	**Volume 7, Chapter 26 Air Quality (application ref: 7.26)**	Section 18.6	Potential changes to air quality (e.g., from fumes emanating from operating construction machinery) could affect nearby habitats. Animals which are not mobile could also be temporarily affected (whereas mobile animals would be expected to move away), including invertebrates, nesting birds, roosting bats, and other small terrestrial animals.
Operation			
Inter-relationships and the identified impacts associated with the operation phase would be no greater than those identified for the construction phase.			
Decommissioning			
Inter-relationships and the identified impacts associated with the decommissioning phase would be no greater than those identified for the construction phase.			

18.12 Summary

457. This chapter has provided a characterisation of the existing environment for terrestrial ecology and ornithology based on both existing and site-specific survey data.

458. Impacts assessed are construction disturbance to statutory and non-statutory designated nature conservation sites, temporary habitat loss/ fragmentation, and death, injury, or disturbance to protected species or destruction damage or disturbance to protected species habitat.

459. There will be a **moderate** adverse effect on breeding birds as a result of the Projects during construction and an additional **moderate** adverse effect on a small area of ancient woodland, at Bentley Moor Wood LWS located within the Substation Zone from the potential deposition of nitrogen associated with construction vehicle movements. These effects are considered significant in EIA terms.

460. There will be a **minor** adverse residual effect on statutory and national designated sites, non-statutory designated sites, habitat loss and fragmentation (excluding the above), GCN, badger, roosting, foraging and commuting bats, over-wintering birds, otter, WCA reptile species, hedgehog, brown hare, and water vole as a result of the Projects during construction, which are not significant in EIA terms.

461. During the operational phase, **minor** adverse residual effects have been assessed on disturbance to habitat and species during maintenance operations, species disturbance from artificial light and impact of permanent habitat loss on habitats and species.

462. Hazel dormouse, fish, invertebrates including white-clawed crayfish and EPS of reptiles have been scoped out of the ES.

463. Examples of mitigation measures identified at the construction phase which are either embedded measures in the **OCoCP (Volume 8, application ref: 8.9)** or **OEMP (Volume 8, application ref: 8.10)** or additional measures which will be secured through the **DCO (Volume 3, application ref: 3.1)** includes, but is not limited to:

- Avoidance of habitat clearance;
- Keeping vegetation clearance to a minimum;
- Reduction of noise pollution through screening;
- Reduction of dust pollution, through suppression techniques;
- Following best practice pollution guidance;
- Re-generation / replacement of lost habitat;

- Two stage vegetation clearance;
- Covering excavations over-night and fitting with ramps textured for grip with a slope no steeper than 40° (installed at intervals no greater than 20 metres for large excavations) to allow animals to escape if they should fall into them;
- Restrictions on night-time working and the use of directional and low-level artificial lighting (occasional night work will be required); and
- Replacement of resting locations i.e. bat roosts, badger setts.

464. Impacts during the decommissioning phases are expected to be similar in nature to those anticipated during construction but of a smaller magnitude. The same potential impacts noted for construction are therefore expected to be scoped in (and out) for decommissioning.

465. As a minimum ecological monitoring for the Projects, outlined in the **OEMP (Volume 8, application ref: 8.10)** would include, but not be limited to:

- INNS management;
- Any specific mitigation from required EPS licences for bats and otter if required;
- Monitoring of bat boxes;
- Monitoring of bird boxes;
- Monitoring of any replacement habitat; and
- Pre-construction surveys.

466. There are no transboundary effects with regard to terrestrial ecology and ornithology as the Onshore Development Area is not in proximity to any international boundaries.

Table 18-20 Summary of Potential Likely Significant Effects on Terrestrial Ecology

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Effect with Embedded Mitigation	Mitigation Measures Proposed	Residual Effect
Construction						
Impact 1: Construction disturbance	National statutory designated sites	Very High to Medium	Negligible	Minor adverse to Negligible	Pollution control **(OCoCP (Volume 8, application ref: 8.9))** Dust Management **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse to **Negligible**
Impact 2: Construction disturbance	Non-statutory designated sites	High to Medium	Low	Moderate to Minor adverse	Minimise habitat loss **(OEMP (Volume 8, application ref: 8.10))** Habitat reinstatment Pollution control **(OCoCP (Volume 8, application ref: 8.9))** Dust Management **(OCoCP (Volume 8, application ref: 8.9))**	**Negligible** **Moderate** adverse (Bentley Moor Wood and Nitrogen deposition only)
Impact 3: Temporary habitat loss / fragmentation	All Habitats	High to Low	Negligible to low	Minor to Moderate adverse	Minimise habitat loss **(OEMP (Volume 8, application ref: 8.10))** Habitat reinstatment and protection Pollution control **(OCoCP (Volume 8, application ref: 8.9))** Dust Management **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse **Moderate** adverse (Bentley Moor Wood and Nitrogen deposition only)
Impact 4: Death, injury or disturbance	Amphibians, including GCN	Medium	Medium	Moderate adverse	Great Crested Newt District Level Licence	**Minor** adverse

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Effect with Embedded Mitigation	Mitigation Measures Proposed	Residual Effect
Impact 5: Death, injury or disturbance	Badger	Medium	Medium	Moderate adverse	Exclusion from setts under licence **(OEMP (Volume 8, application ref: 8.10))**	**Minor** adverse
Impact 6: Death, injury or disturbance	Roosting bats	Medium	Medium	Moderate adverse	Pre-construction Survey **(OEMP (Volume 8, application ref: 8.10))** EPS licence Pollution control **(OCoCP (Volume 8, application ref: 8.9))** Dust Management **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse
Impact 7: Death, injury or disturbance	Foraging and commuting bats	Medium	Low	Minor adverse	Lighting control **(OCoCP (Volume 8, application ref: 8.9))** Reduced width of hedgerow removal Maintenance of existing flight routes	**Minor** adverse
Impact 8: Death, injury or disturbance	Breeding birds	High	Medium	Major adverse	Avoid vegetation clearance during breeding season where possible. Nesting bird checks when this is not possible **(OEMP (Volume 8, application ref: 8.10))** Relevant buffers if active nest is identified **(OEMP (Volume 8, application ref: 8.10))** Pollution control **(OCoCP (Volume 8, application ref: 8.9))**	**Moderate** adverse

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Effect with Embedded Mitigation	Mitigation Measures Proposed	Residual Effect
Impact 9: Death, injury or disturbance	Over-wintering birds	Medium	Medium	Moderate adverse	Pre construction surveys if works are undertaken during the over-wintering season **(OEMP (Volume 8, application ref: 8.10))** Pollution control **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse
Impact 10: Death, injury or disturbance	Otter	Medium	Low	Minor adverse	Pre construction survey **(OEMP (Volume 8, application ref: 8.10))** Derogation licence (if identified) Pollution control **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse
Impact 11: Death, injury or disturbance	Other notable species	Medium	Low	Minor adverse	Minimise habitat loss **(OEMP (Volume 8, application ref: 8.10))** Lighting control **(OCoCP (Volume 8, application ref: 8.9))** Noise and vibration control **(OCoCP (Volume 8, application ref: 8.9))** Cover all excavations **(OEMP (Volume 8, application ref: 8.10))** Pollution control **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Effect with Embedded Mitigation	Mitigation Measures Proposed	Residual Effect
Impact 12: Death, injury or disturbance	Reptile	Medium	Medium	Minor adverse	Habitat manipulation to discourage reptiles from the working areas **(OEMP (Volume 8, application ref: 8.10))**	**Minor** adverse
Impact 13: Death, injury or disturbance	Water vole	Medium	Low	Minor adverse	HDD or other trenchless technique **(OCoCP (Volume 8, application ref: 8.9))** Pre construction survey **(OEMP (Volume 8, application ref: 8.10))** Derogation licence (if identified) Pollution control **(OCoCP (Volume 8, application ref: 8.9))**	**Minor** adverse
Operational						
Impact 15: Habitat and species disturbance from maintenance	All adjacent habitat and species at the time of the maintenance	High	Low	Moderate adverse	General mitigation techniques **(OCoCP (Volume 8, application ref: 8.9))** Derogation licence (if protected species identified)	**Minor** adverse
Impact 16: Species disturbance from artificial lighting	All adjacent habitat and species at the time of the artificial lighting use	Medium	Low	Minor adverse	General mitigation techniques Operational lighting (DCO Requirement 22)	**Minor** adverse

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Effect with Embedded Mitigation	Mitigation Measures Proposed	Residual Effect
Impact 17: Impact of permanent habitat loss on habitats	All permanently lost habitats	High	Negligible	Minor adverse	Keep habitat loss to a minimum **(OCoCP (Volume 8, application ref: 8.9))** Retain connectivity where possible **(OLMP Volume 8, (application ref: 8.11))** Replace lost habitat as close to the Onshore Development Area as possible **(OLMP (Volume 8, application ref: 8.11))**	**Minor** adverse
Impact 18: Impact of permanent habitat loss on species	All species utilising habitats that will be permanently lost	High	Low	Moderate adverse	Keep habitat loss to a minimum **(OCoCP (Volume 8, application ref: 8.9))** Retain connectivity where possible **(OLMP Volume 8, (application ref: 8.11))** Replace lost habitat as close to the Onshore Development Area as possible **(OLMP (Volume 8, application ref: 8.11))** Protected species licences and bespoke mitigation strategies	**Minor** adverse
Decommissioning						
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A Decommissioning Plan would be provided prior to any decommissioning commencing onshore. As such, impacts during the decommissioning phase are assumed to be the same as those identified during the construction phase.						

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