



Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Outline Ecological Management Plan

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Table of Contents

OUTLINE ECOLOGICAL MANAGEMENT PLAN	7
1 Introduction.....	7
1.1 Purpose of Document.....	7
1.2 Project Background.....	7
2 Pre-construction Mitigation Measures.....	10
2.1 General Pre-construction Measures.....	11
2.2 Habitats (including designated sites).....	12
2.3 Protected and Notable Species.....	12
3 Construction Mitigation Measures.....	19
3.1 General Construction Measures.....	19
3.2 Habitats (including designated sites).....	19
3.3 Protected and Notable Species.....	20
4 Post-construction Mitigation Measures.....	23
4.1 Habitats.....	23
4.2 Protected and Notable Species.....	25
4.3 Long-term Ecological Management.....	25
5 Monitoring and Reporting.....	25
5.1 Monitoring.....	25
5.2 Construction.....	26
5.3 Post-construction.....	26
5.4 References	27

Table of Tables

Table 9.19.1: Indicative Pre-Construction Surveys.....	11
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List of Appendices

Appendix 9.19.1 Species Legislation and Conservation Status

Appendix 9.19.2 Outline Biodiversity Net Gain Strategy



Glossary of Acronyms

BBPP	Breeding Bird Protection Plan
BCT	Bat Conservation Trust
BS	British Standard
BSI	British Standards Institution
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
DCO	Development Consent Order
DEP	Dudgeon Offshore Wind Farm Extension Project
DLL	District Level License
DOW	Dudgeon Offshore Wind Farm
EA	Environment Agency
EC	European Commission
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPP	Evidence Plan Process
ES	Environmental Statement
EU	European Union
GB	Great Britain
GCN	Great Crested Newt
HDD	Horizontal directional drilling
HRA	Habitats Regulation Assessment
HVAC	High Voltage Alternating Current
INNS	Invasive Non-Native Species
LMP	Landscape Management Plan
LPA	Local Planning Authority
MW	Megawatt
NVC	National Vegetation Classification
Outline EMP	Outline Ecological Management Plan
PEIR	Preliminary Environmental Impact Assessment
RAMS	Risk Assessments and Method Statements



SAC	Special Area of Conservation
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SOW	Sheringham Offshore Wind Farm
SSSI	Site of Special Scientific Interest
SAC	Special Area of Protection
TPP	Tree Protection Plan
TPZ	Tree Protection Zone
UK	United Kingdom



Glossary of Terms

Order Limits	The area subject to the application for development consent, including all permanent and temporary works for SEP and DEP.
Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
DEP onshore site	The Dudgeon Offshore Wind Farm Extension onshore area consisting of the DEP onshore substation site, onshore cable corridor, construction compounds, temporary working areas and onshore landfall area.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas, and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
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 at the coastline at which the offshore export cables are brought onshore, connecting to the onshore cables at the transition joint bay above mean high water



OUTLINE ECOLOGICAL MANAGEMENT PLAN

1 Introduction

1.1 Purpose of Document

1. This document sets out the Outline Ecological Management Plan (EMP) for the proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) in respect of terrestrial (onshore) ecology and ornithology. The Outline EMP sets out an outline of the actions that are proposed to avoid or mitigate ecological impacts during the pre-construction, construction and operation phases of SEP and DEP. This Outline EMP will form the basis for a final Environmental Management Plan (EMP), which will be prepared and submitted prior to the commencement of onshore construction activities associated with the projects.

1.2 Project Background

2. Equinor New Energy Limited (the Applicant) is seeking a Development Consent Order (DCO) for SEP and DEP which are extensions to the existing Sheringham Shoal Offshore Wind Farm (SOW) and Dudgeon Offshore Wind Farm (DOW), located in the southern North Sea off the north Norfolk Coast, with the closest point to the coast being 15.8km from SEP and 26.5km from DEP.

1.2.1 Key Relevant Components of SEP and DEP

3. Onshore export cables would travel approximately 60km inland from landfall, west of Weybourne, North Norfolk, to a high voltage alternating current (HVAC) onshore substation near to the existing Norwich Main substation. The onshore substation would be constructed to accommodate the connection of both SEP and DEP to the transmission grid.
4. The main onshore components of SEP and DEP include:
 - Landfall including transition joint bay;
 - Up to two ducts installed under the beach at the landfall by Horizontal Directional Drilling (HDD));
 - Onshore cable corridor, including:
 - Onshore export cables laid within open cut trenches or installed in ducts, and associated infrastructure including joint bays and link boxes;
 - Temporary construction access roads and haul roads;
 - Construction compounds; and
 - Trenchless crossings at sensitive features and habitats (e.g. A roads, main rivers and sites designated for nature conservation).
 - Onshore substation, including:
 - Substation operational access road; and
 - Associated earthworks, surface water attenuation and/or landscaping.



5. Further details of the key components of offshore and onshore infrastructure can be found in ES **Chapter 4 Project Description** (document reference 6.1.4).

1.2.2 Outline EMP Scope

6. The purpose of the Outline EMP is to provide a single document that presents the management and mitigation measures that will be undertaken prior to, during and post construction of the onshore elements of SEP and DEP for onshore ecology receptors. It also provides information on any long-term management measures required to enable the reinstatement and/or enhancement of habitats.
7. This Outline EMP provides details of pre-construction ecology surveys which will be required post consent in order to update the ecological baseline and inform the final management and mitigation plan.
8. It has been drafted based on the findings of pre-consent surveys undertaken during 2020 and 2021. Further information and full survey results can be found within the following documents:
- **ES Appendix 20.1 Extended Phase 1 Habitat Survey Report** (document reference 6.3.20.1);
 - **ES Appendix 20.2 Great Crested Newt Survey Report** (document reference 6.3.20.2);
 - **ES Appendix 20.3 Bat Activity Survey Report** (document reference 6.3.20.3);
 - **ES Appendix 20.4 Wintering Bird Survey Report** (document reference 6.3.20.4);
 - **ES Appendix 20.5 Breeding Bird Survey Report** (document reference 6.3.20.5);
 - **ES Appendix 20.6 Initial Biodiversity Net Gain Assessment Report** (document reference 6.3.20.6);
 - **ES Appendix 20.7 Onshore Ecology Desk Study** (document reference 6.3.20.7);
 - **ES Appendix 20.8 Reptile Survey Report** (document reference 6.3.20.8);
 - **ES Appendix 20.9 White Clawed Crayfish Survey Report** (document reference 6.3.20.9);
 - **ES Appendix 20.10 Bat Tree Roost Survey Report** (document reference 6.3.20.10);
 - **ES Appendix 20.11 Invertebrate Survey Report** (document reference 6.3.20.11);
 - **ES Appendix 20.12 National Vegetation Classification (NVC) Survey Report** (document reference 6.3.20.12);
 - **ES Appendix 20.13 Riparian Mammals (Water Vole and Otter) Survey Report** (document reference 6.3.20.13);
 - **ES Appendix 20.14 Badger Survey Report (confidential)** (document reference 6.3.20.14); and



- **ES Appendix 20.15 Arboricultural Survey Report** (document reference 6.3.20.15).

9. At this stage it is not known whether SEP and DEP will be progressed concurrently or separately. For the purposes of this Outline EMP both projects are considered together, which is considered appropriate for this high-level document. Depending on the final timing of works, separate or combined EMPs would be produced.
10. Following the completion of the pre-construction surveys all relevant plans and ecological receptor locations will be updated and included within the final EMP (DCO requirement 15).
11. Specific details and locations of some ecological receptors (e.g. badger setts) are confidential and have been omitted from the public facing version of the Outline EMP. However, these have been provided to Natural England and the relevant planning authorities. This will also apply to the final EMP.
12. This Outline EMP should read in conjunction with the **Outline Code of Construction Practice** (CoCP) (document reference 9.17).

1.2.3 Structure

13. The Outline EMP is set out as follows:
 - **Section 1.2.4 – General Responsibilities;**
 - **Section 2 – Pre-construction Mitigation Measures;**
 - **Section 3 – Construction Mitigation Measures;**
 - **Section 4 – Post-construction Mitigation Measures;**
 - **Section 4.3 – Long-term Ecological Management; and**
 - **Section 5 – Monitoring and Reporting.**

1.2.4 General Responsibilities

14. All of the ecological work set out in the final EMP will be undertaken under the guidance of the appointed SEP and DEP Ecological Clerk of Works (ECoW).
15. Site inductions and toolbox talks for all site personnel will include reference to the requirements of the EMP and CoCP.
16. The ECoW will undertake the following tasks:
 - Arrange any specialist environmental surveys required immediately prior to, or during construction;
 - Undertake regular environmental site inspections;
 - Assist (where deemed necessary) the Principal Contractor in delivering site inductions and toolbox talks (i.e. presentations and the dissemination of information to site personnel on ecological matters). All briefings will include reference to the requirements set out in the EMP. The site-wide ecological requirements will be explained within these briefings. Additional toolbox talks may also be provided for each new area of works to ensure that area-specific requirements are fully understood and implemented;



- Assist in reviewing Risk Assessments and Method Statements (RAMS); and
- Notifying the Principal Contractor of any issues/breaches in the EMP and/or CoCP.

17. All site personnel will be briefed on the role and responsibility of the ECoW. Contact details for the ECoW will be provided within the EMP and will be made available to site personnel and contractors. A copy of the EMP will be kept on site at all times and site personnel will be made aware of its location along with the details of the person to contact in order to obtain a copy.
18. Any known breaches of the requirements documented within the EMP will be reported to the ECoW by the Principal Contractor or site personnel (either directly or through the Principal Contractor) as soon as practicable. Should it become evident to the ECoW that a breach of the requirements of the EMP has occurred, the ECoW will be responsible for confirming this breach to the responsible SEP and DEP Onshore Environment Manager and Site Manager. Where necessary, the responsible SEP and DEP Onshore Environmental Manager will report any breaches to the relevant authorities.
19. The ECoW will be responsible for developing an appropriate ecology incident response plan for any breach of the EMP, should an ecological incident occur. The responsible SEP and DEP Onshore Environmental Manager will ensure that any remedial measures proposed are communicated and where required, approved by the relevant Local Planning Authority (LPA) (North Norfolk District Council, Broadland District Council or South Norfolk Council). Where appropriate Natural England would be consulted to agree any remedial measures that may be required, as would the Environment Agency specifically in relation to Main Rivers.
20. The final EMP will be a live document and the ECoW will be responsible for reviewing and updating the EMP, ensuring that the Principle Contractor and all site personnel are aware of the latest version.

2 Pre-construction Mitigation Measures

21. This section describes the ecological mitigation measures that will be undertaken prior to the commencement of construction to ensure the protection of ecological receptors.



2.1 General Pre-construction Measures

22. Due to the mobility of species and the period of time which will have lapsed between the pre-application surveys and the start of construction, all features surveyed during the pre-application survey effort, and any additional survey locations or features will be re-surveyed, where necessary, in accordance with industry guidance and methodology (i.e. following the approach used during pre-application surveys, or updated best practice at that time). It is possible that additional ecological receptors may be recorded during these pre-construction surveys. Where this occurs, the EMP will be reviewed and updated to include measures for such receptors where appropriate. All pre-construction surveys will be undertaken by appropriately experienced and where necessary, licensed ecologists. All surveys will be carried out in accordance with bio-security risk assessments and safe systems of works (i.e. RAMS), which will be produced by the appropriately experienced surveying ecologists and subsequently approved by the Principle Contractor, prior to the commencement of a survey.
23. The requirement for, and scope of, updated surveys will be dependent on the time elapsed since previous surveys and the extent of any change to supporting habitats, which will be informed through an updated Extended Phase 1 Habitat survey of the construction footprint (including appropriate buffer). All survey updates will be undertaken in accordance with relevant guidance (e.g. CIEEM, 2019; BS 42020:2013). **Table 2.1.19-1** presents an indicative list of the pre-construction surveys that will be undertaken alongside each optimal survey period.

Table 2.1.19-1: Indicative Pre-Construction Surveys

Survey	Number of visits	Survey season
Extended Phase 1 Habitat	One visit	Any time (April to September optimal)
Breeding birds	3-5 visits	April-June
Water vole and otter	Two visits, one in the first half of the breeding season (April to June) and one in the second half of the breeding season (July to September)	April-September
White-clawed crayfish	One visit	May-October
Bat roost	Two to three visits depending on feature suitability for roosting bats	May-September
Bat activity	One visit per month	April-October
Reptile	Seven visits	April-October
Badger	One visit	February to December (avoiding summer months due to density of vegetation potentially limiting survey results)

2.2 Habitats (including designated sites)

24. The EMP will specify protective buffer zones around key retained habitats (e.g. woodland, mature broadleaved trees, ponds, species-rich grasslands and sections of watercourses). These will be specified in the EMP and relevant construction drawings, with reference to other appropriate documents, including Tree Protection Plans (TPPs), Construction Environmental Management Plan (CEMP) and standard industry guidance (e.g. BS5837:2012).
25. No works will be undertaken within these buffer zones, which will be maintained throughout the construction works period. Buffer zones surrounding retained areas of woodland and mature broadleaved trees will be at least 15 metres (m) in width or at least the width of the tree root protection zone, as advised by an appropriately qualified arboriculturist. Where practicable, buffer zones around hedgerows being retained will be at least 5m in width. Additional buffer zones, where required, will be identified by the ECoW around habitat features of value to protected species.
26. All buffer zones will prohibit the tracking of heavy vehicles, and the storage of vehicles, machinery, equipment and soils. Buffer zones will be clearly marked out as specified in the TPP (e.g. using Heras fencing or equivalent), or using high-visibility Netlon fencing or coloured tape, and/or signs describing the prohibitive requirements of the zones will be installed at appropriate locations. Where necessary, specific locations and any requirements will be discussed on site.
27. Full details of other mitigation measures will be set out in the EMP and relevant construction specifications and drawings, including:
 - Details of the location, timing and method for Horizontal Directional Drilling (HDD) to avoid impacts to at the cable landfall and watercourse crossings (including Weybourne Cliffs Site of Special Scientific Interest (SSSI) and the River Wensum SSSI and Special Area of Conservation (SAC)).
 - Details on the procedures that will be implemented during construction activities where there is the potential for the accidental release of lubricants, fuels and oils from construction machinery.
 - Details on the procedures that will be implemented during HDD operations should there be a release/breakout of inert drilling fluids.
 - Details of measures to manage pollution risk during construction, will be set out in the CoCP.

2.3 Protected and Notable Species

28. Pre-construction measures in respect of protected and notable species will be specified in the EMP. Key measures are set out below. Refer to **Appendix 9.19.1 Species Legislation and Conservation Status** (document reference 9.19.1) for further information on species legal and conservation status.



2.3.1 Wintering Birds

29. Where construction works are planned to be undertaken on functionally linked sugar beet fields between November and January inclusive, a pink-footed goose mitigation plan will be prepared and submitted to Natural England for approval prior to construction.

2.3.2 Breeding Birds

30. The key mitigation measures for breeding birds will comprise:
- Removal of vegetation such as hedgerows and scrub will be undertaken outside of the main bird nesting season which typically runs between March to August but is subject to weather and temperature. In locations where this measure cannot be accommodated, certain habitats (such as arable fields, hedgerows and small amounts of scrub) will be checked by an ecologist for the presence of active birds' nests. Where this pre-works check confirms the absence of active nests, clearance works can proceed shortly after, within no more than a few days of the check. If active birds' nests are found, these will be retained *in situ* and allowed to reach their natural conclusion without being disturbed or damaged.
 - Areas of arable fields within the Order Limits that have been identified as either historically or having the potential to support nesting skylarks will be managed prior to commencement of construction to deter nesting skylarks which may seek to use this habitat for nesting. Such management measures may involve the clearance of ground cover (i.e. arable cover) to create unfavourable nesting conditions. Subject to the results of the pre-construction bird surveys, the EMP will include details of all measures that will be adopted to avoid nesting skylarks during construction. No works (i.e. site clearance) likely to impact areas where skylarks are present would be undertaken, until the required measures (i.e. habitat removal) have been undertaken.
 - Measures will be adopted to minimise noise, light and disturbance on identified breeding birds, such as visual screening (e.g. opaque fencing) where necessary.
 - Construction activities will be monitored by an ECoW or suitably qualified ornithologist, who would seek to ensure compliance with the Wildlife and Countryside Act 1981, i.e. by avoiding destruction of nests, eggs or young, and affording increased protection from disturbance to Schedule 1 species breeding birds.



- Where breeding bird activity is recorded, all construction works (excluding vehicle and personnel movements) within that area 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 will be implemented to prevent disturbance. Where, in the opinion of the suitably qualified ecologist, disturbance cannot be avoided by mitigation, construction works within the area of disturbance will be suspended until chicks have fledged.

31. The ECoW will maintain a record of all pre-construction bird nest surveys undertaken. The record will be provided to SEP and DEP Onshore Environmental Manager and a copy will be made available to relevant stakeholders.

2.3.3 Bats

32. All suitable trees within and up to a 50m buffer of SEP and DEP Order Limits that have been identified during the surveys undertaken to date, will be subject to a further pre-construction survey effort that will be undertaken within the appropriate survey window to ascertain the presence or likely absence of transitional/hibernating/roosting bats. The pre-construction survey effort will also include any further surveys deemed appropriate, i.e. a tree climbing survey and/or a thermal imagery survey of any features. All pre-construction bat surveys will be undertaken by a suitably qualified ecologist who holds the appropriate licences.

33. A report of the pre-construction bat survey findings and recommendations will be produced by the suitably qualified and bat licenced ecologist and provided to the SEP and DEP Onshore Environmental Manager and Site Manager. The report will also be made available to relevant stakeholders.

34. Subject to the results of the pre-construction bat roost surveys, an application will be made for a Natural England Bat Mitigation Licence for any works likely to impact confirmed bat roosts. No works would be undertaken affecting confirmed bat roosts until the licence was in place, and works would be undertaken in accordance with the licence method statement, which would detail the timing and method for the removal of trees or other structures supporting bat roost(s), provision of replacement roost(s) (e.g. bat boxes), habitat creation/management, and any monitoring.

35. A Natural England licence return form and report of the works undertaken will then be completed by the suitably qualified and bat licenced ecologist (i.e. the bat licence holder). A copy of this form and report will be provided to Natural England and the local planning authority as soon as reasonably practicable, and as prescribed by the conditions of the Natural England development licence.

36. The following pre-construction mitigation measures for commuting and/or foraging bats within the SEP and DEP Order Limits will also be implemented:



- Where possible, hedgerow removal will be undertaken during the winter, to allow time for bat species to adjust. Furthermore, the length and width of hedgerow requiring removal will be minimised wherever possible; and
- Where existing habitats are located adjacent to construction works areas, these areas will be retained and protected from damage where possible, using fencing.

2.3.4 Badgers

37. Due to the mobile nature of badgers, prior to the commencement of works, a check of the Order Limits plus a 30m buffer zone, will be undertaken by qualified ecologists in order to confirm whether there have been any changes to the site conditions recorded during the pre-application surveys as well as noting any new badger setts that have been excavated.
38. A draft Natural England mitigation licence has been obtained; however, the findings from the pre-construction surveys will be used to identify if any changes to the draft mitigation licence is required. All pre-construction surveys will be undertaken sufficiently in advance of the commencement of works to ensure that should there be any changes required to the draft Natural England licence(s), that this is updated and resubmitted to Natural England prior to works commencing in the area(s) subject to the mitigation licence.
39. If the pre-construction surveys identify areas of key commuting value for badgers (such as well-worn paths connecting setts or foraging grounds) which would be bisected by the construction corridor, warning signs will be installed and reduced speed limits for construction vehicles will be implemented to address increased risk of road traffic accidents with badgers.
40. Where an active badger sett is identified within 30m of the works a Natural England development licence for badgers would be obtained. Where badger setts are identified but works can be maintained at least 30m away (i.e. where a Natural England licence is either not required as works are located outwith the 30m buffer zone) or where the licence is being sought but yet to be received, the ECoW will ensure that a 30m buffer is set up around those active setts. No works will be undertaken within this 30 m buffer until advised by the ECoW. Once the licence has been obtained, the works will need to be carried out in accordance with the requirements of the licence and supervised by the ECoW.
41. A Natural England licence return form and report of the works undertaken will be completed by the ECoW. A copy of this form and report will be provided to Natural England as soon as reasonably practicable and as prescribed under the conditions of the licence.

2.3.5 Otter and Water Vole

42. Due to the mobility of otter and water voles and the period of time which will have lapsed between the pre-application surveys and the start of construction, a suite of pre-construction checks for otter and water voles will be undertaken between four to 12 months prior to the start of construction to determine the requirement for any Natural England licences. These surveys will be undertaken on all watercourses that have been assessed as providing optimal habitat to support otter and/or water vole.
43. Subject to the results of the pre-construction otter and water vole surveys, if required an application to Natural England for the required licence will be submitted. No works would be undertaken affecting these species until the Licence(s) is in place, and works would be undertaken in accordance with the Licence Method Statement(s).
44. Based on the findings from the pre-application surveys, there is no specific licence requirements for otter or water voles. However, general mitigation measures that will be implemented during the works include:
 - Night-time working near watercourses will be avoided or minimised as far as possible; and
 - Exit ramps from excavations near watercourses will be provided at night, so to provide otter/water vole with an escape route and to avoid entrapment.
45. If water vole presence is confirmed during the pre-construction surveys the following measures would be considered. Based on that assumption, it is envisaged that dissuasion techniques (e.g. strimming of vegetation to encourage water voles to move out from the working area) and exclusion fencing would be used to ensure water voles are not harmed by the proposed works. Displacement works is recommended to be carried out between 15th February and 15th April and where sufficient available alternative habitat exists. Regular repeat strimming will be undertaken to maintain the habitat's unsuitability for water voles. It is proposed that this mitigation will most likely discount the need for a Natural England licence.
46. It should be noted that the maximum working width, within the channel, when undertaking watercourse crossings will be no greater than 20m, which is an embedded mitigation designed into SEP and DEP. The exact location of each 20m wide crossing point, within the 45m wide (SEP or DEP in isolation) or 60m wide (SEP and DEP) corridor, will be defined as part of a micro-siting exercise in advance of construction. This compares favourably to current guidance which recommends that works to watercourses should be no greater than 50m in the first instance, (Dean et al. 2016).
47. Trapping and translocation of water voles, if required, should be completed between 15th February – 15th April and under a Natural England licence. A suitably qualified ecologist would be responsible for ensuring a Natural England licence application is submitted to Natural England prior to the commencement of works. A works-free buffer zone of at least 15m would be established around watercourses supporting water voles until a Natural England licence has been obtained.



48. A licence application would be informed by any prior surveys and will contain a detailed method statement and mitigation plan. Licenced works will be carried out under a water vole watching brief, supervised by the suitably qualified ecologist who holds the water vole licence.
49. A suitably qualified ecologist would be responsible for producing a licence return form and report of works carried out under licence. A copy of this form and report would be provided to Natural England and the relevant local planning authority as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.

2.3.6 Reptiles

50. Areas supporting reptiles will be managed prior to the commencement of construction to deter or displace any reptiles which might be present within the working areas. Habitat management will involve the clearance of ground cover to create unfavourable conditions. If habitat is cleared during the reptile hibernation period (which is typically between November and February inclusive, dependent on local weather conditions), then trees and scrub will only be cut to approximately 30cm above ground-level. This is to minimise the potential for disturbance to root balls where hibernating reptiles may be located. Remaining rough grass cover will be mowed short (approximately 5cm to 10cm above ground-level).
51. Subject to the results of updated reptile surveys, the EMP will include details of measures to avoid killing/injury of reptiles during construction. No works (i.e. site clearance) likely to impact areas where reptiles are present would be undertaken, until required measures (i.e. displacement or exclusion, or capture and translocation, under supervision of the ECoW) are in place.
52. All material that has been cut and/or removed, e.g. grass cuttings, tree branches, tree roots, will be left on site for 24-48 hours prior to removal. Material will not be stacked on site as this could provide a habitat feature of potential value reptiles (or other species). Instead, arisings will be removed from site or chipped and spread on site in agreement with the relevant landowner.
53. Habitat clearance during the active reptile season (i.e. between March and October, depending on local weather conditions) will commence in the centre of the identified suitable habitat, progressively moving outwards to enable any reptiles or other animals that may be present to leave the area. Scrub and tall grasses will be cut as above, to between 5cm and 10cm in height above ground level. All removed material will be removed from site, and any uprooting of vegetation or clearance of habitat of potential value to hibernating reptiles will be undertaken during the reptile active period.
54. Areas will be maintained in a condition not favoured by reptiles (i.e. with minimal ground cover) until the commencement of construction, through regular mowing of ground vegetation.
55. If habitat clearance for reptiles is to be undertaken during the breeding bird season, habitats of potential value to nesting birds will be surveyed as described above, allowing any active bird nests to be located.

56. A record of works will be maintained by the ECoW and a copy of this record will be made available to the relevant planning authority (North Norfolk District Council or South Norfolk and Broadlands District Council) and Natural England on request.

2.3.7 Great Crested Newt

57. Pre-application great crested newt surveys have been undertaken of ponds within and up to 250m of the SEP and DEP order limits. A District Level Licence (DLL) has been submitted to Natural England for which the first stage payment is made, and certificate received. In accordance with the DLL, there is no requirement for pre-construction great crested newt surveys to be undertaken or for any mitigation measures to be implemented during construction activities to protect great crested newts.
58. The ECoW will be responsible for completing and submitting any information to Natural England in relation to the DLL, should it be required.

2.3.8 Invasive Non-Native Species

59. Three separate stands of Himalayan balsam have been recorded within, or in proximity to the Order Limits. No other INNS have been identified (ES **Appendix 20.1 Extended Phase 1 Habitat Survey** (document reference 6.3.20.1)). The recorded locations of Himalayan balsam are as follows:
- River Tud between Honingham and Easton (TG 1232 1152) within woodland bordering the River Tud, outside of the Order Limits.
 - Unnamed stream, tributary of the River Wensum east of Swannington (TG 1411 1893), dense stand along the banks.
 - River Bure, east of Saxthorpe (TG 1309 2987), stands on the banks of the river.
60. The main risks of INNS are associated with the transfer of INNS between watercourses or waterbodies. However, the majority of watercourse crossings are being undertaken using HDD but there remains a risk of INNS transfer where works are undertaken in or near water.
61. The locations and extent of INNS, including Himalayan balsam will be informed by updated pre-construction surveys. Should INNS be located within the works area, the following measures will be applied:
- To avoid disturbance and spread of INNS, where practical an exclusion zone will be created around INNS of at least 7m;
 - Signage will be erected to indicate the location of soils, materials or water contaminated with INNS;
 - Should exclusion not be practical, good site practice measures for managing the spread of INNS during works at watercourses will be followed including:
 - Personal working on or between sites should ensure their clothing and footwear and any machinery are cleaned where appropriate to prevent spread;
 - The use of tracked vehicles should be avoided within areas of INNS;



- All vehicles leaving the infested area and/or transporting infested soil/materials must be thoroughly cleaned in a designated wash-down area before being used for other.
- Vegetation clearance within areas of INNS would be undertaken by an appropriately qualified contractor, under the watch of the ECoW.
- Topsoil containing INNS will be managed separately and contained within restricted areas to avoid the spreading INNS to unaffected areas.

3 Construction Mitigation Measures

62. This section describes the ecological mitigation measures that will be undertaken during the construction phase of the development to ensure the protection of ecological receptors.

3.1 General Construction Measures

63. All construction will be undertaken in accordance with the EMP and CoCP. Measures that will be specified in the CoCP will include:

- All works will be carried out taking full account of legislative requirements and Environment Agency (EA) guidance;
- Heavy machinery will not be tracked or over stored soils; and
- Vehicle speeds will be restricted within the working corridor to reduce the likelihood of injury to species on site.

64. Night working is not scheduled as part of the normal construction working hours and may only be undertaken to maintain programme progress and for specific time critical activities (e.g. for long HDD operations). Where night working is unavoidable, or lighting is required for security/health and safety reasons, light fixtures will be directed towards working areas and away from adjacent or nearby habitats of value to protected or notable species. Any security lighting would be motion activated on short timers. Any such installations will be specified in the CoCP and inspected by the ECoW for compliance.

3.2 Habitats (including designated sites)

65. All protective buffer zones described under the Pre-Construction Mitigation Measures will be maintained throughout the construction phase. This will include the adherence and implementation of the protocols to manage the potential accidental release of lubricants, fuels and oils from construction machinery and HDD operations should there be a release/breakout of inert drilling fluids.

66. The ECoW will monitor adherence to the requirements of the buffer zones a minimum of once every two weeks and will maintain a record of all findings and site checks undertaken.

67. Should any breach of the requirements become evident, the ECoW advise what remedial measures are required to be undertaken as soon as practicable to resolve the situation and minimise effects on ecology.



68. Any tree felling works and hedgerow clearance will be carried out in accordance with protected species requirements described in the sections below. The working width for each hedgerow crossed by open-cut trenching will be limited to 20m. Any soil storage areas will be located outside of tree protection zones (TPZs) as identified by the pre-construction arboricultural survey and at least 5m from retained hedgerows.

3.3 Protected and Notable Species

69. Construction measures in respect of protected and notable species will be implemented in accordance with the EMP.

3.3.1 Wintering Birds

70. Where works are undertaken between November and January and within areas of functionally linked sugar beet fields, a pink-footed goose mitigation plan will be prepared and submitted to Natural England prior to its implementation and commencement of construction activities. The steps outlined below will be undertaken in determining any specific requirements relating to wintering birds:

- A pre-construction survey will be undertaken and the findings of which will be used to inform the potential level of disturbance on this species as a result of the proposed works.
- If required, and subject to the findings of the pre-construction survey, measures to reduce any predicted disturbance will be developed and agreed with Natural England. This may also include the provision of alternative foraging habitat but will subject to further discussions and agreements once the pre-construction survey data is available.

3.3.2 Breeding Birds

71. All works would be undertaken in accordance with the EMP. In the event that additional vegetation clearance is required in areas that are likely to support nesting birds, this would be undertaken outside of the bird nesting season (March to the end of August), or subject to inspection by the ECoW. If active birds' nests are found, these would be retained *in situ* until the ECoW confirms that breeding was completed and the nest was no longer in use. The ECoW would advise on retention of an appropriate exclusion zone around the nest until this time.



3.3.3 Bats

- 72. All works affecting confirmed bat roosts would be undertaken in accordance with the Natural England Bat Mitigation Licence and EMP. In the event that additional trees or other features potentially suitable for roosting bats are identified that would be impacted by the works (e.g. if there was a previously unforeseen need to fell or manage a tree), the affected feature would be subject to survey by a suitably experienced/licensed bat ecologist. Any work within 10m (or as otherwise advised by the ECoW) of the feature would be stopped, until the presence of a roost was confirmed or discounted. Any works affecting a confirmed roost would be subject to a further Natural England Mitigation Licence; no work would be undertaken until the Licence was in place and implemented in accordance with the Method Statement.
- 73. All lighting that is required during the construction phase will be designed in accordance with the BCT guidance. Any changes to lighting requirements would need to be discussed and approved in advance with the ECoW.

3.3.4 Badger

- 74. All measures in respect of badgers will be undertaken in accordance with the EMP and Natural England Development Licence. The ECoW will undertake regular site inspections to confirm compliance with these measures. In the event that additional setts (or potential setts) are identified, either by the ECoW or site staff, all works within 30m of the potential sett would stop, until the ECoW had inspected the potential sett. Any works likely to damage or disturb the newly identified sett would be subject to a further Natural England Development Licence; no works would be undertaken within the 30m impact zone (or as otherwise advised by the ECoW), until the Licence was in place and all required measures (e.g. sett closure) implemented.
- 75. Between the months of March and October inclusive, where possible all works will be restricted to daylight hours only. Between November and February inclusive, works extending up to one hour after sunset or beginning up to one hour before sunrise will be permissible because above-ground badger activity (and activity of most small terrestrial animals) at this time of year is reduced.
- 76. All works traffic operating outside of the public highway will be restricted to speed limits in accordance with the transport assessment. This measure will reduce the risk of road traffic accidents of badgers (and other animals) with construction traffic.
- 77. Excavations left open overnight will be left with a battered (sloped) edge no steeper than 40° so that any animals which fall in can climb out rather than become trapped. All excavations will be visually checked by contractors to ensure no animals are present, before the excavation is backfilled.
- 78. Night lighting of the construction site will be minimised or avoided entirely, particularly during the period from March to October inclusive. This should minimise disturbance to badgers and numerous other nocturnal and crepuscular species.



3.3.5 Otter and Water Vole

79. If otter/water voles are encountered during the works, then works will cease, and the ECoW or suitably qualified ecologist contacted. They will assess the need for further mitigation measures including the requirement for a Natural England Licence prior to works re-commencing. Construction works will be carried out in accordance with the requirements of the Licence and under the guidance of the suitably qualified ecologist and, where necessary, an ecological watching brief.

3.3.6 Reptiles

80. Reptile mitigation will be implemented pre-construction in accordance with the EMP. In the event that reptiles are encountered during construction, the ECoW would be contacted, who would move the reptile to suitable retained habitat if possible, and advise on additional measures that would be required to ensure killing/injury to reptiles was avoided.

3.3.7 Great Crested Newt

81. All works will be undertaken in accordance with the Natural England Great Crested Newt DLL.

82. If a GCN is located during construction, works in the area will be halted immediately and the ECoW will be informed. To maintain the welfare of the GCN, a Natural England GCN licensed ecologist will attend the site to handle and where necessary, relocate any GCN to outside the working area and provide further ecological advice as to the way forward.

3.3.8 Invasive Non-Native Species

83. Construction will be implemented in accordance with the INNS Management Plan. Measures will be set in place to minimise the potential for pollution from silt deposition into watercourses and from works vehicles, including measures to prevent transfer of invasive plant or animal species between watercourses. All construction vehicles and machinery entering and leaving the working area(s) will follow the biosecurity measures of the GB NNS “check, clean, dry” guidance. In addition, the following biosecurity protocols will be adopted in all areas known to support INNS as a minimum:

- All vehicles arriving on site will be checked to ensure that they are clean and free from any INNS prior to entering the working area(s).
- If soil or other material is imported to the working area(s), documentation from suppliers will be obtained to ensure it is free from INNS.
- All footwear of construction workers will be inspected visually to ensure they are clean from soil and debris before entering and leaving the working area(s).
- All vehicles will be kept clean, in particular removing any accumulated mud/material before entering and leaving the working area(s).
- All facilities within working area(s) will be equipped with disinfectant to clean footwear/equipment/vehicles prior to entering and leaving the working area(s).



- All removed material and/or disinfectant used to clean footwear/equipment/vehicles will be appropriately disposed of.
- All access to working area(s) will be kept to a minimum and all vehicles and personnel will keep to maintained tracks, with vehicles parked within designated areas and/or hard standing.
- Wherever possible, personnel and vehicles will avoid areas known to contain INNS.

84. The ECoW will undertake regular inspections of the work area to confirm the presence of INNS (including Himalayan balsam) and adherence to required measures. In the event that additional areas of INNS are identified the ECoW will review and update the INNS Management Plan to include these additional area/INNS and their appropriate measures.

4 Post-construction Mitigation Measures

85. All post construction monitoring surveys will be undertaken by an appropriately experienced and where necessary, licenced ecologist(s). All surveys will be undertaken in accordance with bio-security risk assessments and approved risk assessments will be in place prior to the commencement of any survey.

4.1 Habitats

86. Following the completion of construction in an area, cleared, damaged or disturbed habitats will be reinstated in accordance with the agreed specifications. Woodland and scrub are key components of the proposed landscape proposals for the onshore substation. The aim of the management prescriptions is to guide the creation of a well-balanced, naturalistic landscape including woodland/woodland copses, scrub and tree belts, with a varied woodland edge and a dense canopy to provide screening at appropriate locations.

- Adjust stakes and ties at the end of each growing season or as necessary to maintain support and avoid chafing damage and thus minimise the possibility of infection taking hold within any wounds.
- Inspect and if necessary, repair deer, livestock and rabbit protection fencing regularly to ensure that it is effective in preventing browsing of plants by deer, livestock and rabbits.
- Maintain the ground around plants weed free for the first five years to minimise competition allowing plants to grow unimpeded.
- Replace all plants that die annually at the end of each growing season during the first ten years, or when it is agreed that the woodland or scrub has established effectively, and individual plant replacement is unnecessary. In addition to this, planting at the substation will be maintained for the lifetime of the projects (40 years).



- By year three woodland and scrub may need to be thinned. When choosing the specimens to be retained, it should be remembered that the primary functions of the woodland and scrub are to lessen landscape and visual impacts of the onshore substation and help to integrate it into its setting.
- Remove stakes and ties in year five, or when each plant is deemed firm and self-supporting.
- If used, plant shelters and guards should be removed once the trees/shrubs reach a level of maturity where they can withstand browsing wildlife and livestock.
- If the thinned specimens are intended to grow back as coppice the cut needs to be angled to ensure water will not pool on the cut.
- Brushwood and other vegetative arisings will be stacked within the woodland or scrub as small habitat piles, or disposed of offsite as instructed.
- Deadwood is a particularly important woodland habitat and is of value to bats, birds, invertebrates and fungi. To ensure the woodland has the requisite deadwood habitat, dead and dying trees, where they do not present a significant safety risk, should be retained in a variety of situations. This may include creating eco-stick monoliths, a process of severe pollarding that removes all but the trunk of the tree to create standing deadwood.
- Plants that pose a health and safety risk will be managed appropriately.

87. New and replacement hedges, and existing hedges with gaps bolstered with new planting, will be managed as described below. The objective is to increase the habitat potential and functioning of the hedges, some of which may contain mature hedgerow trees, whilst maintaining them as key features of the landscape, and to provide screening of proposed infrastructure.

- Adjust stakes and ties of hedgerow trees at the end of each growing season or as necessary to maintain support and avoid chafing damage and thus minimise the possibility of infection taking hold within any wounds.
- Maintain the ground around each plant weed free for the first ten years to minimise competition allowing plants to grow unimpeded.
- Replace all plants that die annually at the end of each growing season for the first 10 years
- Remove stakes and ties in year five, or when the trees are deemed firm and self-supporting.
- If used, plant shelters/guards should be removed once the trees/shrubs reach a level of maturity where they can withstand browsing wildlife.
- Cut hedges annually between September and February to approximately 2m height, or the height of existing hedges as appropriate. The hedgerows should be managed to create a thick base with a good density of stems.
- Plants that pose a health and safety risk will be managed appropriately.



- 88. All new planting will be carried out in accordance with the Outline Landscape Management Plan (LMP) (document reference 9.18). The final LMP will include details of planting methodologies and plant species lists. The construction of buildings and planting of trees with deep roots will not be permitted above the permanent working area along the onshore cable corridor to prevent damage to onshore export cables.
- 89. The ECoW will be responsible for producing a report to confirm the habitat reinstatement have been carried out in accordance with the requirements of this Outline EMP and from an ecological perspective only.

4.2 Protected and Notable Species

- 90. Where a Natural England licences for protected species has been obtained or identified to be required for construction works to be undertaken, the licence applications may include habitat restoration and enhancement measures for the benefit of the protected species that the licence applies to. These will be carried out by landscape contractors working under the guidance of a suitably qualified ecologist and/or licence holder.
- 91. The suitably qualified ecologist and/or Natural England licence holder will be responsible for producing any required Natural England licence return forms and report of the works undertaken. A copy of the forms and reports will be provided to Natural England and the relevant local planning authority as soon as reasonably practicable and as prescribed under the conditions of the Natural England licence.

4.3 Long-term Ecological Management

- 92. Long-term management of new and retained/enhanced habitats (e.g. new hedgerow and tree planting or wildflower grassland seeding) are presented in the Outline LMP (document reference 9.18) which will be approved by the relevant local planning authority prior to its implementation.
- 93. Details of the voluntary biodiversity net gain commitments are presented in the [Appendix 9.19.2 Outline Biodiversity Net Gain Strategy](#) (document reference 9.19.2).
- 94. Where a Natural England licences for protected species has been obtained or identified to be required for works to be undertaken, the licence holders will be responsible for maintaining a record of all ecology works completed, which will be provided to Natural England and the relevant local planning authority as soon as practicable and as prescribed under the conditions of any Natural England licence.

5 Monitoring and Reporting

5.1 Monitoring

- 95. The ECoW will be responsible for monitoring adherence requirements of the EMP during construction through:
 - Weekly site inspections; and/or
 - Weekly meetings with the Site Manager.



- 96. The ECoW will regularly monitor adherence to the requirements of the protective buffer zones, at least once every two weeks. Should any breach of these requirements become evident, the ECoW will inform the SEP and DEP Environmental Manager and Site Manager. The ECoW will inform the Site Manager of measures required to rectify any potential impacts. The Environment Manager will be responsible for notifying Natural England of any breaches to the buffer zones if necessary and as advised by the ECoW.
- 97. New planting will be monitored during the establishment phase by the Environmental Manager's landscape contractor, landowner or farm manager, as agreed between all parties. Failed plants will be replaced (subject to agreement with landowners) like for like as required to prevent the development of a significant gap in planting.
- 98. Post-construction monitoring of protected species as required under any potential Natural England licences will be undertaken by the ECoW or appropriately experienced and if necessary, licensed ecologist(s), who will be pre-approved by the ECoW.

5.2 Construction

- 99. The ECoW will maintain a record of all ecological work which is undertaken during the construction period, including any ecological watching briefs or protected species surveys and findings of any site visits.
- 100. The ECoW will maintain a record of any breaches of the EMP and any measures undertaken to mitigate potential impacts of a breach. Records will be provided to the Site Manager and the SEP and DEP Environmental Manager, and if necessary the relevant local planning authority and Natural England.
- 101. Should a Natural England licence be required during the construction period, the ECoW will be responsible for applying for the licence.

5.3 Post-construction

- 102. New planting will be monitored for up to ten years along the cable corridor, and for the operational life for planting at the substation (40 years). Failed plants will be replaced (subject to agreement with landowners).
- 103. Should any Natural England development licences be required, the ECoW and/or Natural England licence holder will be responsible for producing and distributing any required Natural England licence return forms and report of the works undertaken.
- 104. The ECoW will be responsible for producing a report to the relevant local planning authority to confirm that all measures have been implemented in accordance with the EMP.

5.4 References

Bat Conservation Trust (2016) Bat Surveys – Good Practice Guidelines. Bat Conservation Trust, London
Bat Conservation Trust (2018) Bats and Lighting in the UK. Bat Conservation Trust, London
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CIEEM (2019) Advice note on the lifespan of ecological reports and surveys. Chartered Institute of Ecology and Environmental Management, Winchester.
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Edgar, P. Foster, J. and Baker, J. (2010) Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.
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