



Hornsea Project Four: Environmental Statement (ES)

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Volume A6, Annex 3.13 – Bat Emergence and Re-Entry Survey Report Part B

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Glossary

Term	Definition
Commitment	<p>A term used interchangeably with mitigation and enhancement measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in EIA terms.</p> <p>Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or ES).</p> <p>Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.</p>
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
EIA Directive	European Union Directive 85/337/EEC, as amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC and then codified by Directive 2011/92/EU of 13 December 2011 (as amended in 2014 by Directive 2014/52/EU).
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Energy balancing infrastructure (EBI)	The onshore substation includes energy balancing Infrastructure. These provide valuable services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations
Export cable corridor (ECC)	The specific corridor of seabed (seaward of Mean High-Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Project Four array area to the Creyke Beck National Grid substation, within which the export cables will be located.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Landfall	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all

Term	Definition
	construction works, including the offshore and onshore ECC, intertidal working area and landfall compound. Where the offshore cables come ashore east of Fraisthorpe.
National Grid Electricity Transmission (NGET) substation	The grid connection location for Hornsea Four at Creyke Beck.
Onshore substation (OnSS)	Comprises a compound containing the electrical components for transforming the power supplied from Hornsea Project Four to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. If a HVDC system is used the OnSS will also house equipment to convert the power from HVDC to HVAC.
Order Limits	The limits within which Hornsea Project Four (the 'authorised project') may be carried out.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).

Acronyms

Acronym	Definition
BCT	Bat Conservation Trust
CIEEM	Chartered Institute of Ecology and Environmental Management
C.Env	Chartered Environmentalist
C.WEM	Chartered Water and Environmental Manager
ECC	Export cable corridor
EECW	Environmental and Ecological Clerk of Works
EP1HS	Extended Phase 1 Habitat Survey
ERYC	East Riding Yorkshire Council
FRGS	Fellow of the Royal Geographical Society
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IEMA	Institute of Environmental Management and Assessment
JNCC	Joint Nature Conservation Committee
MHWS	Mean High Water Spring
NERC	Natural Environment and Rural Communities
NEYEDC	North and East Yorkshire Data Centre
OnSS	Onshore substation
OS	Ordnance Survey
PRF	Potential Roost Feature
UK BAP	UK Biodiversity Action Plan
WCA	Wildlife and Countryside Act

Units

Unit	Definition
km	kilometre
m	metre

1 Introduction

1.1 Project background

- 1.1.1.1 Orsted Hornsea Project Four Limited (the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and on to an onshore substation (OnSS) with energy balancing infrastructure (EBI), and connection to the electricity transmission network.
- 1.1.1.2 Royal HaskoningDHV was commissioned to undertake a suite of bat emergence/re-entry surveys of all features identified as part of the Extended Phase 1 Habitat Survey (EP1HS) ([Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#)) and assessed as providing high or moderate potential for supporting roosting bats within and up to a 50 m buffer around, the onshore Hornsea Four Order Limits (i.e. the landfall, onshore export cable corridor (ECC), the OnSS including EBI, and 400 kV National Grid Electricity Transmission (NGET) connection area).
- 1.1.1.3 This technical annex has been produced to characterise the baseline environment to inform and support the ecological impact assessment set out in [Volume A3, Chapter 3: Ecology and Nature Conservation](#) of the Hornsea Four Environmental Statement (ES).
- 1.1.1.4 Due to the amount of data collated during the Hornsea Four bat surveys, this technical annex has been split into two parts, where:
- [Annex 3.12: Bat Emergence and Re-entry Survey Report Part A](#) – outlines the methodology, survey results, conclusions and mitigations; and
 - [Annex 3.13: Bat Emergence and Re-entry Survey Report Part B](#) (this document) – presents the full survey data, including timings for each survey, as well as detailed information on those features that were surveyed for the presence of roosting bats in 2019.
- 1.1.1.5 Bat Static Detector and Activity Transect Surveys have also been undertaken for Hornsea Four, and these can be found in [Annex 3.8: Bat Static Detector Survey Report Part A](#); [Annex 3.9, Bat Static Detector Survey Report Part B](#); [Annex 3.12: Bat Emergence and Re-entry Survey Report Part A](#) and [Annex 3.13: Bat Emergence and Re-entry Survey Report Part B](#), respectively. For a full understanding of the results of the bat survey programme, both of these bat survey reports require consideration.

2 Feature Descriptions



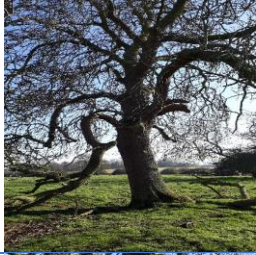

- 2.1.1.1 [Table 1](#) presents the full description for each feature subject to the 2019 bat emergence/re-entry survey, including a photograph where available. Unfortunately, due to a technical issue with the camera, photographs of all features were not possible and where this is the case this is acknowledged in [Table 1](#). No photographs of these features have been obtained.





This was discussed and agreed at a Hornsea Four ecology Evidence Plan Technical Panel meeting on 1st April 2020 (ON-ECO-1.16). All photographs were taken with an iPad 8-megapixel camera (*f*/2.4 aperture).






2.1.1.2 The Target Note (TN) numbers provided in this report are those which were assigned during the EPIHS (see [Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Annex 3.2: Extended Phase 1 Target Note Tables](#)).







Table 1: Full description of all features subject to the 2019 bat emergence/re-entry survey.





(Note: this table should be read in conjunction with Figure 2 to Figure 20 provided in [Annex 3.12: Bat Emergence and Re-entry Survey Report Part A](#)).

Target Note (TN) Reference assigned to Feature	Bat Roost Suitability	Description	Photograph
TN032	Moderate	Large ash situated in hedge, with several visible holes and broken limbs.	
TN042	Moderate	Large ash tree with holes and broken limbs.	
TN046	Moderate	Large ash tree with fallen limbs and cracks present	
TN047	Moderate	Large sycamore with broken limbs and cracks.	

Target Note (TN) Reference assigned to Feature	Bat Roost Suitability	Description	Photograph
TN071	Moderate	Large, mature sycamore with holes visible.	
TN164	Moderate	One mature oak within scrub (Joint Nature Conservation Committee (JNCC): A2.1).	No photograph available
TN165	Moderate	One mature oak with visible cracks and splits.	No photograph available
TN170	Moderate	Mature oak with visible holes, situated adjacent to a stream, connected to woodland and scrub habitat.	
TN263	Moderate	Mature oak in hedge with visible cracks and holes.	
TN264	Moderate	Mature oak in hedge with splits and cracks.	No photograph available
TN265	Moderate	Mature oak with split limbs, in hedge connected to woodland.	
TN273	High	Large mature oak on edge of woodland, relic ivy branches and lots of visible cracks, holes and dead/broken limbs.	

Target Note (TN) Reference assigned to Feature	Bat Roost Suitability	Description	Photograph
TN274	High	Large mature ivy clad oak within hedge, close to woodland.	
TN279	Moderate	Two dead ash trees with large holes and crevices visible.	
TN305	Moderate	Oak with large holes due to broken limbs, holes look to have smaller cavities further in.	
TN314	Moderate	Mature, partly ivy clad, oak with splits and cracks.	
TN315	Moderate	Mature oak with splits and cracks.	

Target Note (TN) Reference assigned to Feature	Bat Roost Suitability	Description	Photograph
TN318	Moderate	Dead oak with split limbs and visible cracks.	
TN321	Moderate	Mature oak with visible cracks and splits.	
TN322	Moderate	Mature oak with visible splits and cracks.	
TN323	Moderate	Large mature oak with visible cracks and holes set within hedge.	
TN335	Moderate	Mature oak within scrub adjacent to stream, ivy clad with broken branches.	
TN338	Moderate	Group of mature and semi mature trees within scrub, one mature oak with moderate bat roost potential.	

Target Note (TN) Reference assigned to Feature	Bat Roost Suitability	Description	Photograph
TN351	Moderate	Barns adjacent to house, some with tiled roofs with potentially accessible areas.	
TN353	Moderate	Mature, ivy clad oak in hedge, limited view from ground however some cracks present.	
TN363	Moderate	Three mature trees (oak and ash) in hedgerow, ivy clad, some PRFs visible.	
TN368	High	Dead oak with multiple cracks, holes and dead branches.	
TN381	Moderate	Mature oak in small copse	No photograph available

3 Weather Conditions and Survey Timing

3.1.1.1 **Table 2** summarises the survey dates, times and weather conditions encountered during each survey visit.

Table 2: Weather conditions and survey dates.

TN Reference assigned to Feature	Survey Visit	Survey Date	Survey Type	Sunrise / Sunset (24 hour clock)	Survey Time (24 hour clock)	Temperature (°C)	Weather Conditions
TN032	1 of 2	16 August 2019	Re-entry	05.41	03.40 – 05.55	12	Light wind, dry, clear
	2 of 2	18 September 2019	Emergence	19.11	19.05 – 20.45	15	Still, dry, clear
TN042	1 of 2	24 July 2019	Emergence	21.13	21.20 – 23.00	18	Still, dry, clear
	2 of 2	16 August 2019	Re-entry	05.41	03.40 – 05.55	12	Light wind, dry, clear
TN046	1 of 2	24 July 2019	Emergence	21.13	21.10 – 23.00	18	Still, dry, clear
	2 of 2	16 August 2019	Re-entry	05.41	03.40 – 05.55	12	Light wind, dry, clear
TN047	1 of 2	24 July 2019	Emergence	21.13	21.10 – 23.00	18	Still, dry, clear
	2 of 2	16 August 2019	Re-entry	05.41	03.40 – 05.55	12	Light wind, dry, clear
TN071	1 of 2	20 August 2019	Emergence	21.13	21.10 – 23.00	15	Still, dry, clear
	2 of 2	19 September 2019	Re-entry	06.43	04.45 – 06.45	8	Still, foggy
TN164	1 of 2	24 July 2019	Emergence	21.13	21.10 – 23.00	18	Still, dry, clear
	2 of 2	21 September 2019	Re-entry	06.45	05.30 – 06.45	8	Dry, foggy
TN165	1 of 2	17 July 2019	Emergence	21.24	21.15 – 11.00	14	Light breeze, intermittent light rain
	2 of 2	16 August 2019	Re-entry	05.41	03.40 – 05.55	12	Light wind, dry, clear
TN170	1 of 2	17 July 2019	Emergence	21.24	21.15 – 11.00	14	Light breeze, intermittent light rain
	2 of 2	16 August 2019	Re-entry	05.41	03.40 – 05.55	12	Light wind, dry, clear
TN263	1 of 2	19 June 2019	Emergence	21.37	21.20 – 23.00	14	Light wind, dry
	2 of 2	14 August 2019	Re-entry	05.40	03.40 – 05.55	15	Light rain, still
TN264	1 of 2	19 June 2019	Emergence	21.37	21.15 – 23.00	14	Still, dry, overcast
	2 of 2	14 August 2019	Re-entry	05.40	03.40 – 05.55	15	Light rain, still
TN265	1 of 2	19 June 2019	Emergence	21.37	21.15 – 23.00	14	Still, dry, overcast
	2 of 2	14 August 2019	Re-entry	05.40	03.40 – 05.55	15	Light rain, still
TN273	1 of 3	19 June 2019	Emergence	21.37	21.15 – 23.00	14	Still, dry, overcast
	2 of 3	14 August 2019	Re-entry	05.40	03.40 – 05.55	15	Light rain, still
	3 of 3	19 September 2019	Re-entry	06.43	04.45 – 06.45	8	Still, foggy
TN274	1 of 3	19 June 2019	Emergence	21.37	21.15 – 23.00	14	Still, dry, overcast
	2 of 3	14 August 2019	Re-entry	05.40	03.40 – 05.55	15	Light rain, still
	3 of 3	19 September 2019	Re-entry	06.43	04.45 – 06.45	8	Still, foggy
TN279	1 of 2	17 July 2019	Emergence	21.23	21.10 – 23.00	14	Light breeze, intermittent light rain
	2 of 2	14 August 2019	Re-entry	05.38	03.40 – 05.55	12	Dry, still, cloudy
TN305	1 of 2	22 July 2019	Emergence	21.16	21.10 – 23.00	16	Dry, clear
	2 of 2	13 August 2019	Re-entry	05.34	03.45 – 05.55	10	Intermittent light rain, light wind
TN314	1 of 2	20 June 2019	Emergence	21.37	21.20 – 23.00	13	Dry, clear
	2 of 2	12 August 2019	Re-entry	05.34	03.30 – 05.45	10	Dry, light wind, clear
TN315	1 of 2	20 June 2019	Emergence	21.37	21.20 – 23.00	13	Dry, clear
	2 of 2	12 August 2019	Re-entry	05.34	03.30 – 05.45	10	Dry, light wind, clear
TN318	1 of 2	20 June 2019	Emergence	21.37	21.20 – 23.00	13	Dry, clear
	2 of 2	12 August 2019	Re-entry	05.34	03.30 – 05.45	10	Dry, light wind, clear
TN321	1 of 2	20 June 2019	Emergence	21.37	21.20 – 23.00	13	Dry, clear
	2 of 2	12 August 2019	Re-entry	05.34	03.30 – 05.45	10	Dry, light wind, clear
TN322	1 of 2	20 June 2019	Emergence	21.37	21.20 – 23.00	13	Dry, clear
	2 of 2	12 August 2019	Re-entry	05.34	03.30 – 05.45	10	Dry, light wind, clear
TN323	1 of 2	20 June 2019	Emergence	21.37	21.20 – 23.00	13	Dry, clear
	2 of 2	23 September 2019	Re-entry	06.48	05.15 – 06.50	14	Dry, brisk wind, clear
TN335	1 of 2	15 July 2019	Emergence	21.25	21.10 – 22.45	15	Dry, light wind, overcast
	2 of 2	23 August 2019	Re-entry	05.54	03.55 – 06.10	11	Dry, light wind, clear

TN Reference assigned to Feature	Survey Visit	Survey Date	Survey Type	Sunrise / Sunset (24 hour clock)	Survey Time (24 hour clock)	Temperature (°C)	Weather Conditions
TN338	1 of 2	15 July 2019	Emergence	21.25	21.10 – 22.45	15	Dry, light wind, overcast
	2 of 2	23 August 2019	Re-entry	05.54	03.55 – 06.10	11	Dry, light wind, clear
TN351	1 of 2	16 July 2019	Emergence	21.24	21.10 – 23.00	18	Dry, cloudy
	2 of 2	13 August 2019	Re-entry	05.34	03.45 – 05.55	10	Intermittent light rain, light wind
TN353	1 of 2	16 July 2019	Emergence	21.24	21.10 – 23.00	18	Dry, cloudy
	2 of 2	13 August 2019	Re-entry	05.34	03.45 – 05.55	10	Intermittent light rain, light wind
TN363	1 of 2	16 July 2019	Emergence	21.24	21.10 – 23.00	18	Dry, cloudy
	2 of 2	13 August 2019	Re-entry	05.34	03.45 – 05.55	10	Intermittent light rain, light wind
TN368	1 of 3	26 June 2019	Emergence	21.37	21.20 – 23.00	14	Dry, light wind, clear
	2 of 3	18 July 2019	Emergence	21.22	21.00 – 23.00	15	Dry, light wind, clear
	3 of 3	15 August 2019	Re-entry	05.39	03.40 – 05.55	14	Dry, light wind, clear
TN381	1 of 2	25 July 2019	Emergence	21.12	21.00 – 22.45	24	Dry, light wind, cloudy
	2 of 2	15 August 2019	Re-entry	05.39	03.38 – 05.55	14	Dry, light wind, clear