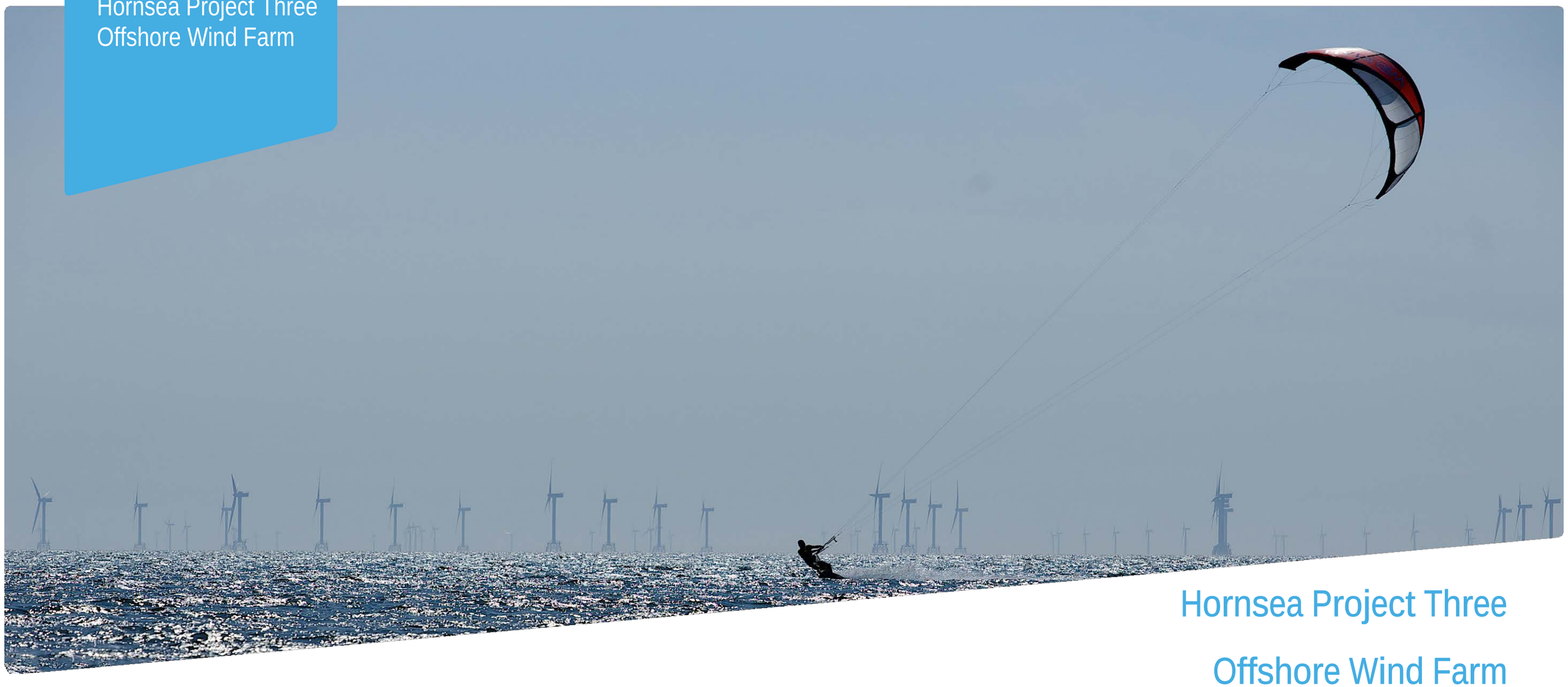
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Environmental Statement:
Volume 4, Annex 5.1 – Enhancement, Mitigation and Monitoring Commitments

PINS Document Reference: A6.4.5.1
APFP Regulation 5(2)(a)

Date: May 2018

Hornsea 3
Offshore Wind Farm

Ørsted

Environmental Impact Assessment

Environmental Statement

Volume 4

Annex 5.1 – Enhancement, Mitigation and Monitoring Commitments

Report Number: A6.4.5.1

Version: Final

Date: May 2018

This report is also downloadable from the Hornsea Project Three offshore wind farm website at:
www.hornseaproject3.co.uk

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Acronyms

Acronym	Description
ADD	Acoustic Deterrent Device
AEZ	Archaeological Exclusion Zones
AIS	Automatic Identification System
ATC	Air Traffic Control
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CBRA	Cable Burial risk Assessment
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CoCP	Code of Construction Practice
COLREGs	The International Regulations for Preventing Collisions at Sea 1972 as amended
cSAC	Candidate Special Area of Conservation
DCO	Development Consent Order
DEPONS	Disturbance Effects on the Harbour Porpoise Population in the North Sea
DML	Deemed Marine Licence
ERCoP	Emergency Response and Cooperation Plan
EWG	Expert Working Group
GBF	Gravity Base Foundation
HMR	Helicopter Main Route
HSE	Health and Safety Executive
HVAC	High Voltage Alternating Current
IALA	International Association of Lighthouse Authorities
IMO	International Maritime Organization
INNS	Invasive Non-native Species
IPMP	In-Principle Monitoring Plan
KISCA	Kingfisher Information Service - Cable Awareness
LAT	Lowest Astronomical Tide
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MOD	Ministry of Defence
MPCP	Marine Pollution Contingency Plan
NATS	NATS Ltd. (formerly National Air Traffic Services Ltd.)
NFFO	National Federation of Fishermen's Organisations
NOTAM	Notice to Airmen
NRA	Navigational Risk Assessment
NUC	Not Under Command
PEMMP	Project Environmental Management and Monitoring Plan
QHSE	Quality, Health, Safety and Environment
REWS	Radar Early Warning System
rMCZ	Recommended Marine Conservation Zone
ROV	Remotely Operated Vehicle
SAC	Special Area of Conservation
SAR	Search and Rescue
SCADA	Supervisory Control and Data Acquisition
SOLAS	Safety of Life at Sea
SSC	Suspended Sediment Concentration
TAEZ	Temporary Archaeological Exclusion Zones
TH	Trinity House
THLS	Trinity House Lighthouse Service
UKHO	United Kingdom Hydrographic Office
VHF	Very High Frequency
WSI	Written Scheme of Investigation

Units

Unit	Description
%	Percent
ft	Feet
kJ	Kilojoules (energy)
km	Kilometre
m	Metre
mm	Millimetre

1. Introduction

1.1.1.1 This document sets out a summary of the enhancement measures, mitigation and monitoring commitments detailed within the Environmental Statement for Hornsea Project Three (hereafter referred to as Hornsea Three). The means of implementation is also specified for each of the enhancement measures, mitigation and monitoring commitments.

1.1.1.2 Where enhancement measures, mitigation or monitoring have not been identified for a specific topic, no associated table has been presented within this document. Those topics with no enhancement measures, mitigation or monitoring commitments include:

- Seascape (volume 2, chapter 10);
- Inter-related effects (offshore) (volume 2, chapter 12); and
- Inter-related effects (onshore) (volume 3, chapter 11).

2. Offshore Enhancement, Mitigation and Monitoring Commitments

2.1 Marine processes

Table 2.1: Marine processes enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.1.1	Volume 2, chapter 1 – Marine Processes	Increases in SSC and deposition of disturbed sediments to the seabed due to cable installation within the Hornsea Three array area.	Cable Specification and Installation Plan: Hornsea Three will employ sensitive cable and scour protection within the areas of designated sites that coincide with Hornsea Three. These cable and scour protection measures will not include concrete mattresses. The cable protection will consider the local seabed conditions, including sediment/substrate type, as outlined in reference number 2.2.2 in Table 2.2 below.	A Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
2.1.2	Volume 2, chapter 1 – Marine Processes	Increases in SSC and deposition of disturbed sediments to the seabed due to dredging for seabed preparation prior to installing gravity base foundations within the Hornsea Three offshore cable corridor.	Mitigation detailed within reference number 2.1.1 above.	Means of implementation as detailed within reference number 2.1.1 above.
2.1.3	Volume 2, chapter 1 – Marine Processes	Increases in SSC and deposition of disturbed sediment to the seabed due to cable installation within the Hornsea Three offshore cable corridor.	Mitigation detailed within reference number 2.1.1 above.	Means of implementation as detailed within reference number 2.1.1 above.
2.1.4	Volume 2, chapter 1 – Marine Processes	Changes to hydrodynamics, sediment transport and beach morphology at the landfall.	Mitigation detailed within reference number 2.1.1 above. Cable trench infill at the nearshore area: Cable installation at the nearshore area may be achieved using open cut trenching methods. It is anticipated that the same shingle excavated from the beach during cable installation would subsequently be used to backfill the trench once the cables had been laid. This would minimise the risk of future erosion.	Means of implementation as detailed within reference number 2.1.1 above.
Operation and maintenance phase				
2.1.5	Volume 2, chapter 1 – Marine Processes	Scour of seabed sediments.	Scour protection: Where scour protection is absent and where the hydrodynamic/ seabed geology allow, scour has the potential to form around turbine and substation/platform foundations. This may lead to the release of material into suspension (higher turbidity) and a change to seabed habitat immediately adjacent to the structure. This will be reduced with the introduction of scour protection, where necessary.	The Scour Protection Management Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(e) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(e) (transmission assets) of the DCO.
2.1.6	Volume 2, chapter 1 – Marine Processes	Increases in SSC and deposition of disturbed sediments to the seabed due to cable maintenance within the Hornsea Three array area.	Mitigation detailed within reference number 2.1.1 above.	Means of implementation as detailed within reference number 2.1.1 above.
2.1.7	Volume 2, chapter 1 – Marine Processes	Increases in SSC and deposition of disturbed sediment to the seabed due to cable maintenance within the Hornsea Three offshore cable corridor.	Mitigation detailed within reference number 2.1.1 above.	Means of implementation as detailed within reference number 2.1.1 above.
2.1.8	Volume 2, chapter 1 – Marine Processes	Changes to beach morphology, hydrodynamics and sediment transport (littoral drift) at the landfall.	Mitigation detailed within reference number 2.1.1 above.	Means of implementation as detailed within reference number 2.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Decommissioning phase				
None proposed.				
Monitoring commitments				
Pre-construction and construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

2.2 Benthic ecology

Table 2.2: Benthic ecology enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.2.1	Volume 2, chapter 2 – Benthic Ecology	Temporary habitat loss/disturbance due to cable laying operations (including anchor placements and sandwave clearance), spud-can leg impacts from jack-up operations and seabed preparation works for GBFs, may affect benthic ecology.	<u>Cable installation through Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs</u>: Should Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs be identified during pre-construction surveys of the Hornsea Three offshore cable corridor (see within reference number 2.2.9 below), appropriate measures will be discussed with statutory consultees to avoid direct impacts to these features, where possible, and on the basis of the extent of these features at the time of construction. This approach is typical for offshore wind farm and cable developments.	The details of cable installation will be set out in the Cable Specification and Installation Plan secured in Schedule 12, Part 2, paragraph 12(1)(h) (transmission assets) of the DCO.
			<u>Cable installation through Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs</u>: In the event that the primary mitigation (i.e. avoiding Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs within the Hornsea Three offshore cable corridor, where possible) fails and export cables need to be installed through an area of reef(s), the cables would be microsited through areas of lower quality reef, avoiding areas of medium or high quality reef and/or cable installation would be restricted to the periphery of reef features to ensure continuous reef features are not bisected. To facilitate this, as more data on potential future Annex I *S. spinulosa* reefs within the North Norfolk Sandbanks and Saturn Reef SAC becomes available, the Reef Index will be recalculated and used to inform cable routing in the North Norfolk Sandbanks and Saturn Reef SAC.	The details of cable installation will be set out in the Cable Specification and Installation Plan secured in Schedule 12, Part 2, paragraph 12(1)(h) (transmission assets) of the DCO.
			<u>Temporary working corridor activities through Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs</u>: Should Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs be identified within the temporary working corridor, appropriate measures will be discussed with statutory consultees to avoid direct impacts to these features (e.g. from disposal of sandwave clearance material).	A Construction Method Statement is secured by the DML. Refer to Schedule 12, Part 2, Paragraph 12(1)(c) (transmission assets) of the DCO. The details of cable installation will be set out in the Cable Specification and Installation Plan secured in Schedule 12, Part 2, paragraph 12(1)(h) (transmission assets) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.2.2	Volume 2, chapter 2 – Benthic Ecology	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology.	Project Environmental Management and Monitoring Plan (PEMMP): A PEMMP will be developed and implemented. The PEMMP will contain a Biosecurity Plan to limit the spread of invasive and non-native species (INNS) and a Marine Pollution Contingency Plan (MPCP). The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and Maritime and Coastguard Agency (MCA)). Measures will be adopted to ensure that the potential for release of pollutants from construction is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Centre for Environment, Fisheries and Aquaculture Science (Cefas) list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Operation and maintenance phase				
2.2.3	Volume 2, chapter 2 – Benthic Ecology	Long term loss of seabed habitat through presence of foundations, scour protection and cable protection, resulting in potential effects on benthic receptors.	<u>Cable Specification and Installation Plan and Scour Protection Management Plan</u>: Hornsea Three will employ sensitive cable and scour protection within the areas of designated sites that coincide with Hornsea Three. These cable and scour protection measures will not include concrete mattresses. The cable and scour protection will consider the local seabed conditions, including sediment/substrate type. Within the designated sites, this may include measures as follows: • Within the North Norfolk Sandbanks and Saturn Reef SAC: this may include measures which may encourage the burial of the scour/cable protection by the surrounding sediment or rock protection which takes into account the typical grain sizes known to occur naturally within the SAC (i.e. coarse gravel, cobbles and boulders); • Within the Wash and North Norfolk Coast SAC: this may include measures which may encourage the burial of the scour/cable protection by the surrounding sediment or rock protection which takes into account the typical grain sizes known to occur naturally within the SAC (i.e. coarse gravel and cobbles); • Within the Cromer Shoal Chalk Beds Marine Conservation Zone (MCZ): cable protection may comprise gravel and cobbles with a mean grain size of 100 mm, maximum grain size of 250 mm; and • Within the Markham's Triangle rMCZ: cable protection may comprise gravel and cobbles with a mean grain size of 100 mm, maximum grain size of 250 mm, while scour protection for foundations, if required, may have a maximum diameter of 360 mm. Cable protection requirements will be detailed in the Cable Specification and Installation Plan and scour protection requirements will be detailed in the Scour Protection and Management Plan which will be produced prior to construction and agreed in consultation with statutory consultees. It is anticipated that the use of this material may encourage the burial of the scour/cable protection by the surrounding sediment, which may serve to reduce any potential effect of long term habitat loss. Where such measures can be employed, local communities associated with the habitat features of designated sites (i.e. infaunal communities where sediment accumulation occurs; epifaunal communities in the case of appropriate cable protection) are likely to colonise these areas, potentially providing some limited recovery of communities in areas where cable protection is placed and reducing the extent of long term habitat loss.	The Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO. The Scour Protection Management Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(e) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(e) (transmission assets) of the DCO.
2.2.4	Volume 2, chapter 2 – Benthic Ecology	Increased risk of introduction or spread of INNS due to presence of subsea infrastructure and vessel movements (e.g. ballast water) may affect benthic ecology and biodiversity.	<u>Biosecurity Plan:</u> This document will be developed and agreed in consultation with statutory consultees, detailing how the risk of potential introduction and spread of INNS will be minimised. This will include measures for cable/scour protection in the unlikely event that this material is sourced from the marine environment (it is anticipated that this material will originate from non-marine sources). The plan will outline measures to ensure vessels comply with the International Maritime Organization (IMO) ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as measures to be adopted in the event that a high alert species is recorded.	Means of implementation as detailed within reference number 2.2.2 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.2.5	Volume 2, chapter 2 – Benthic Ecology	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology.	Project Environmental Management and Monitoring Plan (PEMMP): A PEMMP will be developed and implemented. The PEMMP will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from operation and maintenance plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	Means of implementation as detailed within reference number 2.2.2 above.
Decommissioning phase				
2.2.6	Volume 2, chapter 2 – Benthic Ecology	Permanent habitat loss due to presence of scour/cable protection left in situ post decommissioning, and potential effects on benthic ecology.	Mitigation detailed within reference number 2.2.1 above.	Means of implementation as detailed within reference number 2.2.1 above.
2.2.7	Volume 2, chapter 2 – Benthic Ecology	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect benthic ecology.	Decommissioning Programme: A Decommissioning Programme will be developed and implemented. The Decommissioning Programme will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
Monitoring commitments				
Pre-construction and construction phase				
2.2.8	Volume 2, chapter 2 – Benthic Ecology and IPMP (document reference number A8.8)	Temporary habitat loss/disturbance due to cable laying operations (including anchor placements and sandwave clearance), spud-can leg impacts from jack-up operations and seabed preparation works for gravity base foundations (GBFs), may affect benthic ecology.	Location, extent and composition of Annex 1 Habitats within SACs and/or biogenic or geogenic reefs outside SACs: Pre-construction surveys will be undertaken along the Hornsea Three offshore cable corridor to determine the location, extent and composition of any Annex I reefs within SACs and/or biogenic or geogenic reefs outside SACs.	The pre-construction surveys to identify any determine the location, extent and composition of any Annex 1 reefs within SACs and/or biogenic or geogenic reefs outside SACs within the Order limits is secured by the DML. Refer to Schedule 12, Part 2, Paragraph 16(2)(a)(ii) (transmission assets) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.2.9	Volume 2, chapter 2 – Benthic Ecology and IPMP (document reference number A8.8)	Long term habitat loss of seabed habitat through presence of foundations and scour protection	Mitigation detailed within reference number 2.2.8 above.	Means of implementation as detailed within reference number 2.2.8 above.
Operation and maintenance phase				
2.2.10	Volume 2, chapter 2 – Benthic Ecology and IPMP (document reference number A8.8)	Temporary habitat loss/disturbance from construction activity and infrastructure installation	Monitoring of sensitive cable protection: Hornsea Three will undertake monitoring of a representative proportion of the Hornsea Three offshore cable corridor within designated sites (i.e. North Norfolk Sandbanks and Saturn Reef SAC, The Wash and North Norfolk coast SAC and Cromer Shoal Chalk Beds MCZ) in areas where sensitive cable protection material is employed. The aim of the surveys will be to determine the success of sensitive cable protection measures within designated sites by monitoring the behaviour/recovery of the sediments associated with the cable protection over an agreed period of time and by monitoring any recolonisation/recovery of the associated benthic communities. It is likely that the surveys will be undertaken by a combination of geophysical survey and Remote Operated Vehicle (ROV) survey, however, the details of the survey will be agreed with the statutory consultees.	The post construction surveys to identify any changes to location, extent and composition of benthic habitats of conservation, ecological and or economic importance is secured by the DML. Refer to Schedule 12, Part 2, Paragraph 16(2)(c)(i) (transmission assets) of the DCO.
2.2.11	Volume 2, chapter 2 – Benthic Ecology and IPMP (document reference number A8.8)	Long term loss of seabed habitat through presence of foundations, scour protection and cable protection, resulting in potential effects on benthic receptors.	Mitigation detailed within reference number 2.2.10 above.	Means of implementation as detailed within reference number 2.2.10 above.
Decommissioning phase				
None proposed.				

2.3 Fish and shellfish ecology

Table 2.3: Fish and shellfish ecology enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.3.1	Volume 2, chapter 3 – Fish and Shellfish Ecology	Temporary habitat loss/disturbance from construction operations including foundation installation (e.g. jack-up operations and seabed preparation works) and cable laying operations (including anchor placement) may affect fish ecology	Cable Specification and Installation Plan: Hornsea Three will employ sensitive cable and scour protection within the areas of designated sites that coincide with Hornsea Three. These cable and scour protection measures will not include concrete mattresses. The cable protection will consider the local seabed conditions, including sediment/substrate type, as outlined in reference number 2.2.2 in Table 2.2 above.	The Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
2.3.2	Volume 2, chapter 3 – Fish and Shellfish Ecology	Underwater noise as a result of foundation installation (i.e. piling) and other construction activities (e.g. cable installation) resulting in potential effects on fish and shellfish receptors	Piling soft start: During piling operations, soft starts will be used, with lower hammer energies (i.e. approximately 15% of the maximum hammer energy) used at the beginning of the piling sequence before increasing energies to the higher levels. This measure will reduce the risk of injury to fish species in the immediate vicinity of piling operations.	The Marine Mammal Mitigation Protocol is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(g) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(g) (transmission assets) of the DCO.
2.3.3	Volume 2, chapter 3 – Fish and Shellfish Ecology	Accidental pollution events during the construction phase resulting in potential effects on fish and shellfish receptors	PEMMP: A PEMMP will be developed and implemented. The PEMMP will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from construction is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
Operation and maintenance phase				
2.3.4	Volume 2, chapter 3 – Fish and Shellfish Ecology	EMF emitted by array and export cables during the operational phase causing behavioural responses in fish and shellfish receptors	Cable burial risk assessment (CBRA): Array, interconnector and export cables will typically be buried to between 1 to 2 m. A CBRA will inform cable burial depth, which will depend on ground conditions, and will be undertaken post consent. While burial of cables will not reduce the strength of EMF, it does increase the distance between cables and fish and shellfish receptors, thereby potentially reducing the effect on those receptors.	Means of implementation as detailed within reference number 2.3.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.3.5	Volume 2, chapter 3 – Fish and Shellfish Ecology	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect fish and shellfish	PEMMP: A PEMMP will be developed and implemented. The PEMMP will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from operation and maintenance plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	Means of implementation as detailed within reference number 2.3.1 above.
Decommissioning phase				
2.3.6	Volume 2, chapter 3 – Fish and Shellfish Ecology	Accidental release of pollutants (e.g. from accidental spillage/leakage) may affect fish and shellfish ecology	Decommissioning Programme: A Decommissioning Programme will be developed and implemented. The Decommissioning Programme will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
Monitoring commitments				
Pre-construction and construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

2.4 Marine mammals

Table 2.4: Marine mammals enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.4.1	Volume 2, chapter 4 – Marine Mammals	Underwater noise from foundation piling within the Hornsea Three array area or for the HVAC booster substations within the offshore cable corridor has the potential to cause injury or disturbance to marine mammals	Piling soft start: During piling operations, soft starts will be used, with lower hammer energies (i.e. approximately 15% of the maximum hammer energy) used at the beginning of the piling sequence before increasing energies to the higher levels. The soft-start will provide an audible cue to allow marine mammals to flee the area before piling at full hammer energy commences. The soft/slow-start will help to mitigate any potential auditory injury.	A Construction Method Statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(c) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(c) (transmission assets) of the DCO.
			Marine Mammal Mitigation Protocol (MMMP): A MMMP, approved by the MMO in consultation with Natural England, will be implemented during construction. The MMMP will use acoustic deterrent devices (ADDs) as the primary mitigation measure prior to soft start to ensure marine mammals are deterred. The details of the MMMP will be agreed with Natural England. The use of an approved MMMP will mitigate for the risk of physical or permanent auditory injury to marine mammals within a 'mitigation zone'. The mitigation zone was determined based on the potential for instantaneous auditory injury.	The Marine Mammal Mitigation Protocol is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(g) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(g) (transmission assets) of the DCO.
2.4.2	Volume 2, chapter 4 – Marine Mammals	Increased vessel traffic during construction may result in an increase in disturbance, collision risk, or injury to marine mammals	Codes of conduct for vessel operators: To minimise the potential for collision risk or potential injury to marine mammals codes of conduct will be issued to all Hornsea Three vessel operators and adhered to at all times. The codes of conduct will include advice to operators to not deliberately approach marine mammals and to avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride.	A Construction Method Statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(c) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(c) (transmission assets) of the DCO.
2.4.3	Volume 2, chapter 4 – Marine Mammals	Accidental pollution release during construction (including construction activities, vessels, machinery, and offshore fuel storage tanks) may lead to release of contaminants into the marine environment and subsequently result in potential effects on marine mammals	PEMMP: A PEMMP will be developed and followed. The PEMMP will cover the construction and operation and maintenance phases of Hornsea Three respectively. This document will include a contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from construction, operation and decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
2.4.4	Volume 2, chapter 4 – Marine Mammals	Changes in the fish and shellfish community resulting from impacts during construction may lead to loss of prey resources for marine mammals	Mitigation commitments as detailed within Table 2.3.	Means of implementation as detailed within Table 2.3.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Operation and maintenance phase				
2.4.5	Volume 2, chapter 4 – Marine Mammals	Increased vessel traffic during operation and maintenance may result in an increase in disturbance to and collision risk with marine mammals	Mitigation detailed within reference number 2.4.2 above.	Secured by the DMLs. Refer to Schedule 11, Part 2, paragraph 4(5) (generation assets) and Schedule 12, Part 2, paragraph 5(5) (transmission assets) of the DCO.
2.4.6	Volume 2, chapter 4 – Marine Mammals	Electromagnetic Fields (EMF) emitted by array and export cables may affect marine mammal behaviour	CBRA: Array, interconnector and export cables will typically be buried to between 1 to 2 m. A CBRA will inform cable burial depth, which will depend on ground conditions, and will be undertaken post consent. While burial of cables will not reduce the strength of EMF, it does increase the distance between cables and marine mammal receptors, thereby potentially reducing the effect on those receptors.	A Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
2.4.7	Volume 2, chapter 4 – Marine Mammals	Accidental pollution released during operation and maintenance (including maintenance activities, vessels, machinery and offshore fuel storage tanks) may lead to release of contaminants into the marine environment and subsequently result in potential effects on marine mammals	PEMMP: A PEMMP will be developed and implemented. The PEMMP will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from operation and maintenance plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
Decommissioning phase				
2.4.8	Volume 2, chapter 4 – Marine Mammals	Increased vessel traffic during decommissioning activities may result in an increased collision risk to marine mammals	Mitigation detailed within reference number 2.4.2 above.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.4.9	Volume 2, chapter 4 – Marine Mammals	Accidental pollution released during decommissioning (including decommissioning activities, vessels, machinery and offshore fuel storage tanks) may lead to release of contaminants into the marine environment and subsequently result in potential effects on marine mammals	Decommissioning Programme: A Decommissioning Programme will be developed and implemented. The Decommissioning Programme will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
Monitoring commitments				
Pre-construction and construction phase				
2.4.10	Volume 2, chapter 4 – Marine Mammals and IPMP (document reference number A8.8)	Behavioural disturbance from foundation installation (i.e. percussive piling)	Monitoring as required under the Plan for Marine Mammal Monitoring: The key uncertainty relates to the population level consequence of disturbance when considering cumulative level disturbance. It is well established that addressing such a high level uncertainty is best achieved through industry wide studies / initiatives that have the ability to tackle these population level cumulative concerns. It is therefore, likely that a commitment to contribute to any such industry wide studies would be the most pragmatic approach to monitoring for this topic. However, whilst it is recognised that monitoring at the individual project level is too small scale to address such population scale cumulative level uncertainty, consideration will be given to site-specific monitoring where it is established that there is a specific information gap within a wider strategic study that could be meaningfully filled at the individual project level.	A plan for marine mammal monitoring is secured by the DMLs, Schedule 11, Part 2, paragraph 15(2)(a)(i) and (c)(i) (generation assets) of the DCO.
2.4.11	Volume 2, chapter 4 – Marine Mammals and IPMP (document reference number A8.8)	Lethal and injurious effects as a result of foundation installation (i.e. percussive piling)	Marine mammal monitoring to inform mitigation as required under the MMMP: If monitoring forms part of the MMMP then it may comprise either (or a combination of) visual observation or acoustic monitoring. Note that if alternative options are adopted (such as through the use of ADDs) then this monitoring may not be required. In the circumstance that visual and or acoustic methods are used, the objectives will be to survey for the presence of marine mammals to ensure they are not within the relevant impact zone prior to the onset of piling, and inform the implementation of appropriate mitigation actions.	The Marine Mammal Mitigation Protocol is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(g) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(g) (transmission assets) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.4.12	Volume 2, chapter 4 – Marine Mammals and IPMP (document reference number A8.8)	Effects as a result of foundation installation (i.e. percussive piling)	Monitoring to validate the underwater noise modelling that underpins the impact assessment: Monitoring will only be undertaken if it is not possible to demonstrate that existing evidence base does not provide appropriate validation at the time of drafting the plan. Unless the MMO agrees otherwise in writing, measurements of noise generated by the installation of the first four foundations of each discrete foundation type to be constructed under this licence where driven or part-driven pile foundations are used. The transects monitored in the survey will be informed by the predictions for noise propagation within the Environmental Statement.	Noise monitoring is secured by the DMLs, Schedule 11, Part 2, paragraph 15(2)(b)(i) (generation assets) of the DCO.
			Duration of piling activity: Monitoring the actual duration of piling activity during the installation of the turbine and substation foundations will be undertaken. This will be undertaken to increase the level of certainty in the piling duration assumptions within impact assessments given the material influence such assumptions have on the level of effect associated with underwater noise impacts on marine mammals. The monitoring outputs will be provided to the MMO following the completion of the construction phase.	Monitoring of duration of piling is secured by the DMLs, Schedule 11, Part 2, paragraph 15(2)(b)(ii) (generation assets) of the DCO.
Operation and maintenance phase				
2.4.13	Volume 2, chapter 4 – Marine Mammals and IPMP (document reference number A8.8)	Behavioural disturbance from foundation installation (i.e. percussive piling)	Monitoring detailed within reference number 2.4.10 above.	Means of implementation as detailed within reference number 2.4.10 above.
Decommissioning phase				
None proposed.				

2.5 Offshore ornithology

Table 2.5: Offshore ornithology enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Construction phase				
2.5.1	Volume 2, chapter 5 – Offshore Ornithology	Impact of pollution including accidental spills and contaminant releases which may affect species' survival rates or foraging activity.	PEMMP: A PEMMP will be developed and followed. The PEMMP will cover the construction and operation and maintenance phases of Hornsea Three respectively. This document will include a contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from construction, operation and decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
Operation and maintenance phase				
2.5.2	Volume 2, chapter 5 – Offshore Ornithology	The impact of pollution including accidental spills and contaminant releases associated with maintenance or supply/service vessels which may affect species' survival rates or foraging activity.	Monitoring detailed within reference number 2.5.1 above.	Means of implementation as detailed within reference number 2.5.1 above.
2.5.3	Volume 2, chapter 5 – Offshore Ornithology	Mortality from collision with rotating turbine blades	Turbine hub height: A minimum wind turbine hub height of 127.47 m (above LAT) will be used for Hornsea Three. This provides for a minimum lower blade tip height clearance of 34.97 m LAT. This hub height is considered appropriately conservative so as to minimise the risk of bird collisions.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
2.5.4	Volume 2, chapter 5 – Offshore Ornithology	Impact of attraction to lit structures by migrating birds in particular may cause disorientation, reduction in fitness and possible mortality	Lighting of structures: Installation of appropriate lighting on wind farm structures. Lighting of wind turbines will meet minimum requirements, namely as set out in the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation O-117 on 'The Marking of Offshore Wind Farms' for navigation lighting and by the Civil Aviation Authority in the Air Navigation Orders (CAP 393 and guidance in CAP 764). In keeping with the minimum legal requirements, this will minimise the risks of migrating birds becoming attracted to, or disorientated by turbines at night or in poor weather.	Aids to navigation secured by Schedule 11, Part 2, paragraph 6 (generation assets) and Schedule 12, Part, paragraph 7 (transmission assets) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Decommissioning phase				
2.5.5	Volume 2, chapter 5 – Offshore Ornithology	The impact of pollution including accidental spills and contaminant releases associated with removal of infrastructure and supply/service vessels may lead to direct mortality of birds or a reduction in foraging capacity.	Decommissioning Programme: A Decommissioning Programme will be developed and implemented. The Decommissioning Programme will contain a Biosecurity Plan to limit the spread of INNS and a MPCP. The MPCP will outline procedures to protect personnel working and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to Hornsea Three. The MPCP will also outline mitigation measures should an accidental spill occur, address all potential contaminant releases and include key emergency contact details (e.g. Environment Agency, Natural England and MCA). Measures will be adopted to ensure that the potential for release of pollutants from decommissioning plant is minimised. These will likely include: designated areas for refuelling where spillages can be easily contained; only using chemicals included on the approved Cefas list under the Offshore Chemical Regulations 2002; storage of these in secure designated areas in line with appropriate regulations and guidelines; double skinning of pipes and tanks containing hazardous substances; and storage of these substances in impenetrable bunds. In this manner, the potential for release of contaminants from rigs and supply/service vessels will be strictly controlled, thus providing protection for marine life across all phases of the offshore wind farm development.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
Monitoring commitments				
Pre-construction and construction phase				
2.5.6	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	Disturbance/displacement due to construction activity	Ornithological Monitoring Plan (OMP): An OMP will be developed and implemented. The options that are likely to be considered during the drafting of the OMP (post consent) will include site specific studies (including standardised pre-and post-construction surveys), colony specific studies and or contributions to more industry wide strategic work. Furthermore, the approach to Hornsea Three OMP will be cognisant of Hornsea Project One and Hornsea Project Two monitoring and wider Ørsted strategic work planned and ensure that any monitoring is complementary to or repetitive of this. The form and nature of the monitoring that is recommended within the OMP will be based on the final form the consent, the final project design, the current industry knowledge/knowledge gaps relevant to those effects predicted for Hornsea Three (and the key receptors/risks as identified from a desk based review) at the time of drafting the OMP. The OMP will be approved by the MMO, in consultation with Natural England. Strategic work may represent options such as a contribution to an industry wide study (i.e. via Offshore Renewables Joint Research Project (ORJIP)), or a contribution towards (for example) colony specific work being carried out by another party (i.e. not directly related to Hornsea Three) the results of which will enhance the knowledge base for future development etc. Any site-specific monitoring will focus on key species and seasons identified from a desk based review of volume 2, chapter 5: Offshore Ornithology of Environmental Statement and Report to Inform Appropriate Assessment (document reference number A5.2).	Ornithological monitoring secured by Schedule 11 Part 2, paragraph 15(a)(ii) and (c)(ii) (generation assets) of the DCO.
2.5.7	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	Indirect effects, such as changes in habitat or abundance and distribution of prey.	Monitoring detailed within reference number 2.5.6 above.	Means of implementation as detailed within reference number 2.5.6 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Operation and maintenance phase				
2.5.8	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	Impact of physical displacement from an area around turbines (300) and other ancillary structures (up to twelve offshore HVAC collector substations, three offshore accommodation platforms and four offshore HVAC booster stations) during the operation and maintenance phase of the development may result in effective habitat loss and reduction in survival or fitness rates.	Monitoring detailed within reference number 2.5.6 above.	Means of implementation as detailed within reference number 2.5.6 above.
2.5.9	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	The impact of indirect effects, such as changes in habitat or abundance and distribution of prey.	Monitoring detailed within reference number 2.5.6 above.	Means of implementation as detailed within reference number 2.5.6 above.
2.5.10	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	Mortality from collision with rotating turbine blades	Monitoring detailed within reference number 2.5.6 above.	Means of implementation as detailed within reference number 2.5.6 above.
2.5.11	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	Impact of barrier effects caused by the physical presence of turbines and ancillary structures may prevent clear transit of birds between foraging and breeding sites, or on migration.	Monitoring detailed within reference number 2.5.6 above.	Means of implementation as detailed within reference number 2.5.6 above.
2.5.12	Volume 2, chapter 5 – Offshore Ornithology and IPMP (document reference number A8.8)	Impact of disturbance as a result of activities associated with maintenance of operation and maintenance turbines, cables and other infrastructure may result in disturbance or displacement of bird species	Monitoring detailed within reference number 2.5.6 above.	Means of implementation as detailed within reference number 2.5.6 above.
Decommissioning phase				
None proposed.				

2.6 Commercial fisheries

Table 2.6: Commercial fisheries enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.6.1	Volume 2, chapter 6 – Commercial Fisheries	Hornsea Three array area construction activities and physical presence of wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	Safety Zones and advisory safety distances: Advance warning and accurate location details of Safety Zones and advisory safety distances will be provided to ensure sufficient notice for either gear removal and/or avoidance of construction areas. Safety Zones and advisory safety distances: Application for and use of the following safety zones to ensure navigational safety: • Up to 500 m safety zones around infrastructure being constructed or decommissioned; • Up to 50 m safety zones around incomplete structures at which construction activity may be temporarily paused (and therefore the 500 m safety zone has lapsed); • Up to 500 m safety zones around manned platforms; and • Up to 1,000 m advisory safety distances around vessels undertaking major construction activities. On-going liaison with all fishing fleets: On-going liaison with all fishing fleets will be undertaken, including Regular Notice to Mariners, to request mariners maintain an advisory safe distance (up to 1,000 m) from construction vessels and its attendant anchor spread and/or anchor handling tugs. Aids to Navigation: Partially constructed turbines will be marked correctly with temporary Aids to Navigation to ensure navigational safety. Notice to Mariners: The location of cable protection will be provided via Notice to Mariners to minimise the risk of gear snagging.	An application will be made post-grant of the DCO for a safety zone under section 95 of the Energy Act 2004. The Fisheries Coexistence and Liaison Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(3) (generation assets) and Schedule 12, Part 2, Paragraph 12(3) (transmission assets) of the DCO.
2.6.2	Volume 2, chapter 6 – Commercial Fisheries	Hornsea Three offshore cable corridor construction activities leading to reduction in access to, or exclusion from established fishing grounds.	Mitigation detailed within reference number 2.6.1 above.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.3	Volume 2, chapter 6 – Commercial Fisheries	Displacement from Hornsea Three array area leading to gear conflict and increased fishing pressure on adjacent grounds.	Mitigation detailed within reference number 2.6.1 above.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.4	Volume 2, chapter 6 – Commercial Fisheries	Displacement from the Hornsea Three offshore cable corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	Mitigation detailed within reference number 2.6.1 above.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.5	Volume 2, chapter 6 – Commercial Fisheries	Hornsea Three array area and Hornsea Three offshore cable corridor construction activities leading to displacement or disruption of commercially important fish and shellfish resources.	As per measures outlined in Table 2.3 above.	Means of implementation as detailed within Table 2.3 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.6.6	Volume 2, chapter 6 – Commercial Fisheries	Hornsea Three array area and Hornsea Three offshore cable corridor construction activities leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the array and export cable areas.	Marine coordination: Appropriate marine coordination to ensure risks associated with construction vessels are minimised. Guard vessels: Where appropriate, guard vessels will be used to protect construction activities, provide assistance and communicate information to passing vessels. Safety Zones and advisory safety distances: Advance warning and accurate location details of Safety Zone and advisory safety distances will be provided to ensure sufficient notice for either gear removal and/or avoidance of construction areas. On-going liaison with all fishing fleets: On-going liaison with all fishing fleets will be undertaken, including Regular Notice to Mariners, to request mariners maintain an advisory safe distance (up to 1,000 m) from construction vessels and its attendant anchor spread and/or anchor handling tugs.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.7	Volume 2, chapter 6 – Commercial Fisheries	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and construction vessel traffic from Hornsea Three array area leading to interference with fishing activity.	Mitigation detailed within reference number 2.6.6 above.	Means of implementation as detailed within reference number 2.6.6 above.
Operation and maintenance phase				
2.6.8	Volume 2, chapter 6 – Commercial Fisheries	Physical presence of Hornsea Three array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	Safety Zones and advisory safety distances: Advance warning and accurate location details of Safety Zone and advisory safety distances will be provided to ensure sufficient notice for either gear removal and/or avoidance of maintenance areas. Safety zones: Application for and use of the following safety zones to ensure navigational safety: • Up to 500 m safety zones around infrastructure undergoing major maintenance; • Up to 500 m safety zones around manned platforms during operational phase; and • Up to 1,000 m advisory safety distances around vessels undertaking major maintenance activities. On-going liaison with all fishing fleets: On-going liaison with all fishing fleets will be undertaken, including Regular Notice to Mariners, to request mariners maintain an advisory safe distance (up to 1,000 m) from maintenance vessels and its attendant anchor spread and/or anchor handling tugs. Notice to Mariners: The location of cable protection will be provided via Notice to Mariners to minimise the risk of gear snagging. Post construction survey: A post construction survey will be undertaken to detect any construction debris and subsequent removal where necessary and/or possible. Floating turbines: Floating turbines have been removed from the design envelope in order to maximise opportunity for co-existence with commercial fisheries.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.9	Volume 2, chapter 6 – Commercial Fisheries	Physical presence of offshore export cable and infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	Mitigation detailed within reference number 2.6.8 above.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.10	Volume 2, chapter 6 – Commercial Fisheries	Displacement from Hornsea Three array area and Hornsea Three offshore cable corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	Mitigation detailed within reference number 2.6.8 above.	Means of implementation as detailed within reference number 2.6.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.6.11	Volume 2, chapter 6 – Commercial Fisheries	Physical presence of Hornsea Three array area leading to gear snagging.	On-going liaison with all fishing fleets: On-going liaison with all fishing fleets will be undertaken, including Regular Notice to Mariners, to request mariners maintain an advisory safe distance (up to 1,000 m) from maintenance vessels and its attendant anchor spread and/or anchor handling tugs. Fisheries Coexistence and Liaison Plan (FCLP): A FCLP will be developed and implemented in accordance with the outline fisheries coexistence and liaison plan to ensure opportunities to fish are maintained where possible. This would be produced in collaboration with the National Federation of Fishermen's Organisations (NFFO) and other fisheries representatives. Safety zones: Application for and use of the following safety zones to ensure navigational safety: • Up to 500 m safety zones around infrastructure undergoing major maintenance; • Up to 500 m safety zones around manned platforms during operational phase; and • Up to 1,000 m advisory safety distances around vessels undertaking major maintenance activities.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.12	Volume 2, chapter 6 – Commercial Fisheries	Physical presence of the offshore export cable leading to gear snagging.	Mitigation detailed within reference number 2.6.11 above.	Means of implementation as detailed within reference number 2.6.11 above.
2.6.13	Volume 2, chapter 6 – Commercial Fisheries	Electromagnetic fields, habitat alteration, noise and other ecological impacts due to operational and maintenance activities leading to displacement or disruption of commercially important fish and shellfish resources.	Cable burial risk assessment (CBRA): Array, interconnector and export cables will typically be buried to between 1 to 2 m. A CBRA will inform cable burial depth, which will depend on ground conditions, and will be undertaken post consent.	The Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
2.6.14	Volume 2, chapter 6 – Commercial Fisheries	Physical presence of Hornsea Three array and offshore export cable leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the Hornsea Three array area and offshore cable corridor.	Navigational markers: Adequate navigational markers including lighting, will be implemented as directed by Trinity House Lighthouse Service (THLS) to ensure navigational safety. Notification of all offshore and seabed structures: Notification of all offshore and seabed structures (locations of cables to be disseminated via Kingfisher Information Service - Cable Awareness (KISCA) Charts) to minimise risk of gear snagging. Incidents: Early communication of any incidents will be provided to the fishing sector to ensure navigational safety. Safety zones: Application for and use of the following safety zones to ensure navigational safety: • Up to 500 m safety zones around infrastructure undergoing major maintenance; • Up to 500 m safety zones around manned platforms during operational phase; and • Up to 1,000 m advisory safety distances around vessels undertaking major maintenance activities.	Means of implementation as detailed within reference number 2.6.1 above.
2.6.15	Volume 2, chapter 6 – Commercial Fisheries	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Hornsea Three array area and Hornsea Three offshore cable corridor infrastructure leading to interference with fishing activity.	Monitoring detailed within reference number 2.6.14 above.	Means of implementation as detailed within reference number 2.6.14 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Decommissioning phase				
2.6.16	Volume 2, chapter 6 – Commercial Fisheries	Hornsea Three array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds.	Mitigation detailed within reference number 2.6.1 above.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval
2.6.17	Volume 2, chapter 6 – Commercial Fisheries	Hornsea Three offshore cable corridor decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds.	Mitigation detailed within reference number 2.6.1 above.	
2.6.18	Volume 2, chapter 6 – Commercial Fisheries	Displacement from Hornsea Three array area leading to gear conflict and increased fishing pressure on adjacent grounds.	Mitigation detailed within reference number 2.6.1 above.	
2.6.19	Volume 2, chapter 6 – Commercial Fisheries	Displacement from the Hornsea Three offshore cable corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	Mitigation detailed within reference number 2.6.1 above.	
2.6.20	Volume 2, chapter 6 – Commercial Fisheries	Decommissioning activities leading to displacement or disruption of commercially important fish and shellfish resources.	Mitigation detailed within reference number 2.6.5 above.	
2.6.21	Volume 2, chapter 6 – Commercial Fisheries	Decommissioning activities leading to longer steaming distances to alternative fishing grounds.	Mitigation detailed within reference number 2.6.6 above.	
2.6.22	Volume 2, chapter 6 – Commercial Fisheries	Increased vessel traffic, including Hornsea Three array area related and changes in shipping routes, leading to interference with fishing activity.	Mitigation detailed within reference number 2.6.6 above.	
2.6.23	Volume 2, chapter 6 – Commercial Fisheries	Physical presence of cable and scour protection leading to gear snagging.	Decommissioning programme: A Decommissioning Programme will be developed and implemented. The Decommissioning Programme will identify any in situ hazards to and ensure that they are either removed or marked on charts.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
Monitoring commitments				
Pre-construction and construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

2.7 Shipping and navigation

Table 2.7: Shipping and navigation enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.7.1	Volume 2, chapter 7 – Shipping and Navigation	Construction activities within the Hornsea Three array area and offshore cable corridor may displace vessels leading to increased journey times or distances during periods of adverse weather.	Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Aids to navigation secured by Schedule 11, Part 2, paragraph 6 (generation assets) and Schedule 12, Part, paragraph 7 (transmission assets) of the DCO.
2.7.2	Volume 2, chapter 7 – Shipping and Navigation	Construction activities within the Hornsea Three array area may displace commercial ferries leading to increased journey times or distances for commercial ferries during periods of adverse weather.	Mitigation detailed within reference number 2.7.1 above.	Means of implementation as detailed within reference number 2.7.1 above.
2.7.3	Volume 2, chapter 7 – Shipping and Navigation	Presence of pre commissioned infrastructure within the Hornsea Three array area and offshore cable corridor may cause increased vessel to structure allision risk external to the array for all vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate the risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Safety Zones and advisory safety distances: Application for and use of the following safety zones to ensure navigational safety: • Up to 500 m safety zones around infrastructure being constructed or decommissioned; • Up to 50 m safety zones around infrastructure following installation but pre-commissioning; • Up to 500 m safety zones around manned platforms; and • Up to 1,000 m advisory safety distances around vessels undertaking major construction activities.	An application will be made post-grant of the DCO for a safety zone under section 95 of the Energy Act 2004.
			Back-up power supplies and Supervisory Control and Data Acquisition (SCADA) systems for turbines: Back-up power supplies and SCADA systems will be used for turbines in order to need aid to navigation requirements.	Means of implementation as detailed within reference number 2.7.1 above.
			Buoyed construction area: Buoys will be deployed around construction work in line with TH requirements. These will include a combination of cardinal and/or safe water marks.	Means of implementation as detailed within reference number 2.7.1 above.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Charting of Hornsea Three array area, offshore HVAC booster station(s), export cables and array cables: The Hornsea Three array area will be marked on relevant United Kingdom Hydrographic Office (UKHO) Admiralty charts. These areas will generally be marked as "submarine power cable area" as well as with wind farm symbology. The Hornsea Three offshore HVAC booster station(s) shall also be charted. Cables will be marked on nautical charts in line with UKHO standards. Note that depending upon the scale of the chart, array cabling may not be shown and it may only be the export cables that are visible.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during key periods of construction.	A Construction Method Statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(c) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(c) (transmission assets) of the DCO.
			Lighting and marking of the wind farm: Structures will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of the wind farm.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from construction activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above Lowest Astronomical Tide (LAT).	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Safe passing distance (advisory) around construction vessels: A 1,000 m advisory safe passing distance around work areas will be requested during construction, and up to 1,000 m advisory safe distances around cable installation vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under The International Regulations for Preventing Collisions at Sea 1972 (as amended) (COLREGs; IMO, 1972 as amended).	A Construction Method Statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(c) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(c) (transmission assets) of the DCO.
			Temporary Aids to Navigation: Consultation will be undertaken with TH on the implementation of temporary Aids to Navigation for construction activities.	Means of implementation as detailed within reference number 2.7.1 above.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.4	Volume 2, chapter 7 – Shipping and Navigation	Presence of pre commissioned infrastructure within the Hornsea Three array area and offshore cable corridor may increase vessel to structure allision risk external to the array for NUC vessels in an emergency situation (including machinery related problems or navigational system errors).	Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during key periods of construction.	Means of implementation as detailed within reference number 2.7.3 above.
			Marine coordination: Appropriate marine coordination will be in place to help ensure that project vessels do not present an unacceptable risk to each other or to transiting vessels.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from construction activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a separate legal requirement.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above Lowest Astronomical Tide (LAT).	The lower blade tip height is secured by requirement 2, Part 3 of Schedule 2 of the DCO.
2.7.5	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may cause increased vessel to structure allision risk internally within the construction area for recreational and fishing vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Back-up power supplies and SCADA systems for turbines: Back-up power supplies and SCADA systems will be used for turbines in order to need aid to navigation requirements.	Means of implementation as detailed within reference number 2.7.1 above.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Charting of Hornsea Three array area and offshore HVAC booster station(s): The Hornsea Three array area will be marked on relevant UKHO Admiralty charts. These areas have generally been marked as "submarine power cable area" as well as with wind farm symbology. The Hornsea Three offshore HVAC booster station(s) shall also be charted.	Means of implementation as detailed within reference number 2.7.1 above.
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during key periods of construction.	Means of implementation as detailed within reference number 2.7.3 above.
			Lighting and marking of the wind farm: Structures within the Hornsea Three array area will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine coordination: Appropriate marine coordination will be in place to help ensure that project vessels do not present an unacceptable risk to each other or to transiting vessels.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from construction activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Safe passing distance (advisory) around construction vessels: A 1,000 m advisory safe passing distance around work areas will be requested during construction, and up to 1,000 m advisory safe distances around cable installation vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972; as amended).	A Construction Method Statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(c) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(c) (transmission assets) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
			Temporary Aids to Navigation: Consultation with TH will be undertaken on the implementation of temporary Aids to Navigation for construction activities.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.7.6	Volume 2, chapter 7 – Shipping and Navigation	Presence of pre commissioned structures (including subsea elements) and cables (which may be exposed or partially buried) may present an increased risk of gear snagging for commercial fishing vessels with mobile gear.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate the risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			CBRA (or similar) and periodic surveys: Cables will be buried where seabed conditions allow, and cable protection measures will be employed to mitigate risks associated with anchor interaction where necessary. The subsea cables will be subject to periodic inspection in order to confirm they remain buried or protected and do not become a hazard to marine navigation. This will include ad hoc inspections after any reported actual anchor interactions. A Cable Specification and Installation Plan, and a Scour Protection Management and Cable Armouring Plan, will be developed and implemented. These will include details of any cable protection, will be submitted to the MMO at least four months prior to the construction of Hornsea Three.	A Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO. The Scour Protection Management Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(e) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(e) (transmission assets) of the DCO.
			Charting of Hornsea Three array area and offshore HVAC booster station(s): The Hornsea Three array area will be marked on relevant UKHO Admiralty charts. These areas will generally be marked as “submarine power cable area” as well as with wind farm symbology. The Hornsea Three offshore HVAC booster station(s) shall also be charted.	Means of implementation as detailed within reference number 2.7.1 above.
			Lighting and marking of the wind farm: Structures within the Hornsea Three array area will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen’s awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
Operation and maintenance phase				
2.7.7	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area and offshore cable corridor may displace vessels leading to increased journey times or distances during periods of adverse weather.	Mitigation detailed within reference number 2.7.1 above.	Means of implementation as detailed within reference number 2.7.1 above.
2.7.8	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may displace commercial ferries leading to increased journey times or distances for commercial ferries during periods of adverse weather.	Mitigation detailed within reference number 2.7.1 above.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.7.9	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may cause vessels to be deviated, leading to increased encounters and therefore increasing the vessel to vessel collision risk.	Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Compliance with UK and Flag State regulations, and IMO conventions including COLREGs and International Convention for the Safety of Life at Sea (SOLAS): Hornsea Three will comply with UK and Flag State regulations and IMO conventions to ensure that standard levels of navigation and vessel safety continue to be adhered to by all project related vessels.	No need for this to be secured beyond the existing legislative framework.
			Marine coordination: Appropriate marine coordination will be in place to help ensure that project vessels do not present an unacceptable risk to each other or to transiting vessels.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from maintenance activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Quality, Health, Safety and Environmental (QHSE) documentation: Marine QHSE documentation will be developed and implemented to ensure safe operation on a daily basis, including work vessel operations.	This is not secured in the DCO or DMLs as this is a legal requirement.
			Safe passing distance (advisory) around maintenance vessels: A 1,000 m advisory safe passing distance will be requested around maintenance vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972; as amended).	Secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 4(6) (generation assets) and Schedule 12, Part 2, Paragraph 5(6) (transmission assets) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.10	Volume 2, chapter 7 – Shipping and Navigation	Presence of the Hornsea Three offshore HVAC booster station(s) may cause vessels to be deviated, leading to increased encounters and therefore increasing the vessel to vessel collision risk.	Mitigation detailed within reference number 2.7.9 above.	Means of implementation as detailed within reference number 2.7.9 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.7.11	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may increase vessel to structure allision risk external to the array for all vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Application and use of safety zones of up to 500 m during operation for manned platforms: Operational safety zones of 500 m will be applied for around accommodation platforms. Given that these would be required over the life of the project, these safety zone applications will include a safety case.	An application will be made post-grant of the DCO for a safety zone under section 95 of the Energy Act 2004.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Back-up power supplies and SCADA systems for turbines: Back-up power supplies and SCADA systems will be used for turbines in order to need aid to navigation requirements.	Means of implementation as detailed within reference number 2.7.1 above.
			Charting of Hornsea Three array area and offshore HVAC booster station(s): The Hornsea Three array area will be marked on relevant UKHO Admiralty charts. These areas will generally be marked as “submarine power cable area” as well as with wind farm symbology. The Hornsea Three offshore HVAC booster station(s) shall also be charted.	Means of implementation as detailed within reference number 2.7.1 above.
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during key periods of maintenance activities within the operation and maintenance phase.	Means of implementation as detailed within reference number 2.7.3 above.
			Lighting and marking of the wind farm: Structures within the Hornsea Three array area will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from maintenance activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen’s awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Safe passing distance (advisory) around maintenance vessels: A 1,000 m advisory safe passing distance will be requested around maintenance vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972; as amended).	Secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 4(6) (generation assets) and Schedule 12, Part 2, Paragraph 5(6) (transmission assets) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.12	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may increase vessel to structure allision risk external to the array for NUC vessels in an emergency situation (including machinery related problems or navigational system errors).	Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Guard vessels: Guard vessel(s) may be present within the Hornsea Three array area and along the offshore cable corridor during certain maintenance activities within the operation and maintenance phase.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine coordination: Appropriate marine coordination will be in place to help ensure that project vessels do not present an unacceptable risk to each other or to transiting vessels.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from maintenance activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.13	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may cause increased vessel to structure allision risk internally within the array for recreational and fishing vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above. Aids to Navigation Management Plan will be secured by the DMLs. Refer to Schedule 13, Part 2, Paragraph 15(2)(j) (transmission assets).
			Back-up power supplies and SCADA systems for turbines: Back-up power supplies and SCADA systems will be used for turbines in order to need aid to navigation requirements.	Means of implementation as detailed within reference number 2.7.1 above.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Charting of Hornsea Three array area and offshore HVAC booster station(s): The Hornsea Three array area will be marked on relevant UKHO Admiralty charts. These areas have generally been marked as "submarine power cable area" as well as with wind farm symbology. The Hornsea Three offshore HVAC booster station(s) shall also be charted.	Means of implementation as detailed within reference number 2.7.1 above. Shipping notifications will be secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 9 (generation assets) and Schedule 12, Part 2, Paragraph 9 (transmission assets) of the DCO.
			Guard vessels: Guard vessel(s) may be present within the Hornsea Three array area and along the offshore cable corridor during certain maintenance activities within the operation and maintenance phase.	Means of implementation as detailed within reference number 2.7.1 above.
			Lighting and marking of the wind farm: Structures within the Hornsea Three array area will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine coordination: Appropriate marine coordination will be in place to help ensure that project vessels do not present an unacceptable risk to each other or to transiting vessels.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from maintenance activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above. Shipping notifications will be secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 9 (generation assets) and Schedule 12, Part 2, Paragraph 9 (transmission assets) of the DCO.
			Safe passing distance (advisory) around maintenance vessels: A 1,000 m advisory safe passing distance will be requested around maintenance vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972; as amended).	Secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 4(6) (generation assets) and Schedule 12, Part 2, Paragraph 5(6) (transmission assets) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.7.14	Volume 2, chapter 7 – Shipping and Navigation	Presence of surface offshore HVAC booster station(s) within the Hornsea Three offshore cable corridor may increase vessel to structure allision risk for all vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate the risk associated with extinguished lights and sound signals.	Means of implementation as detailed within reference number 2.7.1 above.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Charting of Hornsea Three array area, offshore HVAC booster station(s), export cables and array cables: The Hornsea Three offshore HVAC booster station(s) shall be charted. Cables will be marked on nautical charts in line with UKHO standards.	Means of implementation as detailed within reference number 2.7.1 above.
			Lighting and marking of the offshore HVAC booster station(s): Structures will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from maintenance activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Safe passing distance (advisory) around maintenance vessels: A 1,000 m advisory safe passing distance will be requested around maintenance vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972; as amended).	Secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 4(6) (generation assets) and Schedule 12, Part 2, Paragraph 5(6) (transmission assets) of the DCO.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.7.15	Volume 2, chapter 7 – Shipping and Navigation	Presence of subsea HVAC booster station(s) and cable protection within the Hornsea Three offshore cable corridor may increase vessel to subsea structure allision risk for all vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate risk associated with extinguished lights and sound signals.	Means of implementation as detailed within reference number 2.7.1 above.
			CBRA (or similar) and periodic surveys: Cables will be buried where seabed conditions allow, and cable protection measures will be employed to mitigate risks associated with anchor interaction where necessary. The subsea cables will be subject to periodic inspection in order to confirm they remain buried or protected and do not become a hazard to marine navigation. This will include ad hoc inspections after any reported actual anchor interactions. A Cable Specification and Installation Plan, and a Scour Protection Management and Cable Armouring Plan, will be developed and implemented. These will include details of any cable protection, will be submitted to the MMO at least four months prior to the construction of Hornsea Three.	A Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO. The Scour Protection Management Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 12(1)(e) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(e) (transmission assets) of the DCO.
			Charting of offshore HVAC booster station(s) and export cables: Hornsea Three offshore HVAC booster stations and export cables will be marked on nautical charts in line with UKHO standards.	Means of implementation as detailed within reference number 2.7.1 above.
			Electronic interference minimisation: A Cable Specification and Installation Plan will be prepared. This will include the technical specification of offshore electrical circuits, and a desk-based assessment of attenuation of electro-magnetic field strengths, shielding and cable burial depth in accordance with industry good practice.	A Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
			Guard vessels: Guard vessel(s) will be present along the Hornsea Three offshore cable corridor during certain maintenance activities within the operation and maintenance phase.	Means of implementation as detailed within reference number 2.7.3 above.
			Lighting and marking of the offshore HVAC booster station(s): Structures will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from maintenance activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	The PEMMP is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Surface buoys: Surface buoy(s) (likely per structure) will be deployed at the location of the subsea HVAC booster station(s) where the under keel clearance is less than 30 m.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.16	Volume 2, chapter 7 – Shipping and Navigation	Presence of structures (including subsea elements) and cables may present an increased risk of gear snagging for commercial fishing vessels with mobile gear.	Mitigation detailed within reference number 2.7.6 above.	Means of implementation as detailed within reference number 2.7.6 above.
2.7.17	Volume 2, chapter 7 – Shipping and Navigation	Operation and maintenance activities may diminish emergency response capability (including SAR) within the Hornsea Three array area.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate risk associated with extinguished lights and sound signals.	Means of implementation as detailed within reference number 2.7.1 above. Aids to Navigation Management Plan will be secured by the DMLs. Refer to Schedule 13, Part 2, Paragraph 15(2)(j) (transmission assets).
			Emergency Response and Co-operation Plan (ERCoP): An ERCoP will be developed and implemented for all phases of the project.	Emergency response and cooperation plan will be secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 13 (generation assets) and Schedule 12, Part 2, Paragraph 14 (transmission assets) of the DCO.
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during certain maintenance activities within the operation and maintenance phase.	Means of implementation as detailed within reference number 2.7.3 above.
			Lighting and marking of the offshore HVAC booster station(s): Structures will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			MGN 543 (as of April 2018): The individual turbine structures will have functions and procedures in place as per requirements for generator shut down in emergency situations.	Means of implementation as detailed within reference number 2.7.1 above.
			Personal Protective Equipment (PPE): All personnel will wear the correct PPE suitable for their location and role at all times, as defined by the relevant QHSE documentation. This will include the use of Personal Locator Beacons (PLB).	This is not secured in the DCO or DMLs as this is a legal requirement.
			Self-help capabilities: Provision of self-help capabilities will assist in dealing with wind farm associated emergencies. Consideration shall be given to towage, pollution response and man overboard.	Means of implementation as detailed within reference number 2.7.1 above.
Decommissioning phase				
2.7.18	Volume 2, chapter 7 – Shipping and Navigation	Decommissioning activities within the Hornsea Three array area and offshore cable corridor may displace vessels leading to increased journey times or distances during periods of adverse weather.	Mitigation detailed within reference number 2.7.1 above.	Means of implementation as detailed within reference number 2.7.1 above.
2.7.19	Volume 2, chapter 7 – Shipping and Navigation	Decommissioning activities within the Hornsea Three array area may displace commercial ferries leading to increased journey times or distances for commercial ferries during periods of adverse weather.	Mitigation detailed within reference number 2.7.1 above.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.7.20	Volume 2, chapter 7 – Shipping and Navigation	Presence of decommissioning infrastructure within the Hornsea Three array area and offshore cable corridor may cause increased vessel to structure allision risk external to the array for all vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate the risk associated with extinguished lights and sound signals.	Means of implementation as detailed within reference number 2.7.1 above.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Safety Zones and advisory safety distances: Application for and use of the following safety zones to ensure navigational safety: • Up to 500 m safety zones around infrastructure being decommissioned; • Up to 50 m safety zones around incomplete structures at which decommissioning activity may be temporarily paused (and therefore the 500 m safety zone has lapsed); • Up to 500 m safety zones around manned platforms; and • Up to 1,000 m advisory safety distances around vessels undertaking major decommissioning activities.	An application will be made post-grant of the DCO for a safety zone under section 95 of the Energy Act 2004.
			Back-up power supplies and SCADA systems for turbines: Back-up power supplies and SCADA systems will be used for turbines in order to need aid to navigation requirements.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Buoyed decommissioning area: Buoys will be deployed around decommissioning work in line with TH requirements. These will include a combination of cardinal and/or safe water marks.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during key periods of decommissioning.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Lighting and marking of the wind farm: Structures will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from decommissioning activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of Schedule 2 of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Safe passing distance (advisory) around construction vessels: A 1,000 m advisory safe passing distance around work areas will be requested during decommissioning phases, and up to 1,000 m advisory safe distances around cable removal vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972 as amended).	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Temporary Aids to Navigation: Consultation will be undertaken with TH on the implementation of temporary Aids to Navigation for construction activities.	Means of implementation as detailed within reference number 2.7.1 above.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.21	Volume 2, chapter 7 – Shipping and Navigation	Presence of decommissioning infrastructure within the Hornsea Three array area and offshore cable corridor may cause increased vessel to structure allision risk for NUC vessels in an emergency situation (including machinery related problems or navigational system errors).	Mitigation detailed within reference number 2.7.4 above.	Means of implementation within reference number 2.7.4 above.
2.7.22	Volume 2, chapter 7 – Shipping and Navigation	Presence of infrastructure within the Hornsea Three array area may cause increased vessel to structure allision risk internally within the array for recreational and fishing vessels.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate the risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Back-up power supplies and SCADA systems for turbines: Back-up power supplies and SCADA systems will be used for turbines in order to need aid to navigation requirements.	Means of implementation as detailed within reference number 2.7.1 above.
			Bridge links: Consideration will be given to navigational safety when designing the height and location of bridge links within the Hornsea Three array area (e.g. avoiding higher risk locations such as at the periphery of the array) and the bridge links will be designed in line with MCA and TH requirements as per experience within the oil and gas industry.	A design statement is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(a) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(a) (transmission assets) of the DCO.
			Guard vessels: Guard vessel(s) will be present within the Hornsea Three array area and along the offshore cable corridor during key periods of decommissioning.	Means of implementation as detailed within reference number 2.7.1 above.
			Lighting and marking of the wind farm: Structures within the Hornsea Three array area will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Marine coordination: Appropriate marine coordination will be in place to help ensure that project vessels do not present an unacceptable risk to each other or to transiting vessels.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
			Marine pollution contingency planning: Measures will be adopted to ensure that the potential for release of pollutants from decommissioning activities is minimised, which will include planning for accidental spills and responding to all potential contaminant releases.	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.
			Safe passing distance (advisory) around construction vessels: A 1,000 m advisory safe passing distance around work areas will be requested during decommissioning, and up to 1,000 m advisory safe distances around cable removal vessels. These are advisory and are not enforceable; however vessels will also be displaying Restricted in Ability to Manoeuvre lights under COLREGs (IMO, 1972; as amended).	A Decommissioning Programme will not be secured by the DCO, but will be secured by the provisions of the Energy Act 2004 which allows the Secretary of State to require that a Decommissioning Programme is submitted to him for approval.
			Temporary Aids to Navigation: Consultation will be undertaken with TH on the implementation of temporary Aids to Navigation for decommissioning activities.	Means of implementation as detailed within reference number 2.7.1 above.
			Vessel health and safety requirements: As industry standard mitigation, it shall be ensured that all project related vessels meet both IMO conventions for safe operation as well as HSE requirements, where applicable. This includes complying with International Maritime Regulations, carrying AIS equipment on board, complying with relevant regulations for each vessel's size and class of operation and walk to work solutions.	This is not secured in the DCO or DMLs as this is a legal requirement.
2.7.23	Volume 2, chapter 7 – Shipping and Navigation	Presence of decommissioned structures (including subsea elements) and cables (left in situ) may present an increased risk of gear snagging for commercial fishing vessels with mobile gear.	Aids to Navigation Management Plan: An Aid to Navigation Management Plan will be developed and implemented to mitigate the risk associated with extinguished lights and sound signals throughout all phases of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Lighting and marking of the wind farm: Structures will be marked and lit in accordance with IALA Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013). Other visual and auditory Aids to Navigation may also be implemented. The placement and standard of Aids to Navigation will be agreed with TH prior to the construction of Hornsea Three.	Means of implementation as detailed within reference number 2.7.1 above.
			Blade clearance: Turbines will be constructed to ensure that the minimum rotor blade clearance is 34.97 m above LAT.	The lower blade tip height is secured by Schedule 1, Part 3, paragraph 2(1)(d) of the DCO.
			Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.7.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Monitoring phase				
Pre-construction and construction phase				
2.7.24	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of pre commissioned infrastructure within the Hornsea Three array area and offshore cable corridor may cause increased vessel to structure allision risk external to the array for all vessels.	High resolution bathymetric surveys: As identified in reference 2.1.10 in Table 2.1 above, to provide a baseline bathymetry of areas within which construction activity will take place. Results from the survey will be used to inform the Cable Specification and Installation Plan, which will in turn give due consideration to the identification of any cable protection which exceeds 5% of navigable depth referenced to Chart Datum and, in the event that any area of cable protection exceeding 5% of navigable depth is identified, details of any steps (to be determined following consultation with the MCA) to be taken to ensure existing and future safe navigation is not compromised.	The high-resolution swath bathymetric survey is secured by the DML. Refer to Schedule 11, Part 2, Paragraph 15(2)(a)(iii) (generation assets) and Schedule 12, Part 2, Paragraph 16(2)(a) (transmission assets) of the DCO. The Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
2.7.25	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may cause increased vessel to structure allision risk internally within the construction area for recreational and fishing vessels.	Mitigation detailed within reference number 2.7.24 above.	Means of implementation as detailed within reference number 2.7.24 above.
2.7.26	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may increase vessel to structure allision risk external to the array for all vessels.	Mitigation detailed within reference number 2.7.24 above.	Means of implementation as detailed within reference number 2.7.24 above.
2.7.27	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may cause increased vessel to structure allision risk internally within the array for recreational and fishing vessels.	Mitigation detailed within reference number 2.7.24 above.	Means of implementation as detailed within reference number 2.7.24 above.
2.7.28	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of subsea HVAC booster station(s) and cable protection within the Hornsea Three offshore cable corridor may increase vessel to subsea structure allision risk for all vessels.	Mitigation detailed within reference number 2.7.24 above.	Means of implementation as detailed within reference number 2.7.24 above.
2.7.29	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of pre commissioned structures (including subsea elements) and cables (which may be exposed or partially buried) may present an increased risk of gear snagging for commercial fishing vessels with mobile gear.	Cable monitoring: Monitoring and inspection of cables during installations to ensure cables are not left exposed and/or unmarked in order to, amongst other things; reduce snagging risk to anchors and fishing gear. This is undertaken as standard practice as a means to ensure assets are not at risk, and also as a health and safety requirement.	The Cable Specification and Installation Plan is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(h) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(h) (transmission assets) of the DCO.
2.7.30	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Construction activities within the Hornsea Three array area and offshore cable corridor may displace vessels leading to increased journey times or distances during periods of adverse weather.	Monitoring by Automatic Identification System (AIS) and Very High Frequency (VHF): Vessel traffic monitoring by AIS will be undertaken for the duration of the construction period. A report will be submitted to the MMO and the MCA at the end of each year of the construction period (28 day period per year accounting for seasonal variations).	Vessel traffic monitoring is secured by the DML. Refer to Schedule 11, Part 2, Paragraph 15(2)(b)(iii) (generation assets) and Schedule 12, Part 2, Paragraph 16(2)(b) (transmission assets) of the DCO.
2.7.31	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Construction activities within the Hornsea Three array area may displace commercial ferries leading to increased journey times or distances for commercial ferries during periods of adverse weather.	Mitigation detailed within reference number 2.7.30 above.	Means of implementation as detailed within reference number 2.7.30 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Operation and maintenance phase				
2.7.32	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area and offshore cable corridor may displace vessels (excluding commercial ferries) leading to increased journey times or distances during periods of adverse weather.	Monitoring by AIS and VHF: Vessel traffic monitoring by AIS will be undertaken during the operation and maintenance phase for a minimum of one year.	Vessel traffic monitoring is secured by the DML. Refer to Schedule 11, Part 2, Paragraph 15(2)(c)(iii) (generation assets) and Schedule 12, Part 2, Paragraph 16(2)(c)(ii) (transmission assets) of the DCO.
2.7.33	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may displace commercial ferries leading to increased journey times or distances for commercial ferries during periods of adverse weather.	Mitigation detailed within reference number 2.7.32 above.	Means of implementation as detailed within reference number 2.7.32 above.
2.7.34	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may increase vessel to structure allision risk external to the array for all vessels.	Mitigation detailed within reference number 2.7.32 above.	Means of implementation as detailed within reference number 2.7.32 above.
2.7.35	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may increase vessel to structure allision risk external to the array for NUC vessels in an emergency situation (including machinery related problems or navigational system errors).	Mitigation detailed within reference number 2.7.32 above.	Means of implementation as detailed within reference number 2.7.32 above.
2.7.36	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of infrastructure within the Hornsea Three array area may cause increased vessel to structure allision risk internally within the array for recreational and fishing vessels.	Mitigation detailed within reference number 2.7.32 above.	Means of implementation as detailed within reference number 2.7.32 above.
2.7.37	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of subsea HVAC booster station(s) and cable protection within the Hornsea Three offshore cable corridor may increase vessel to subsea structure allision risk for all vessels.	Mitigation detailed within reference number 2.7.32 above.	Means of implementation as detailed within reference number 2.7.32 above.
2.7.38	Volume 2, chapter 7 – Shipping and Navigation and IPMP (document reference number A8.8)	Presence of structures (including subsea elements) and cables may present an increased risk of gear snagging for commercial fishing vessels with mobile gear.	Mitigation detailed within reference number 2.7.32 above.	Means of implementation as detailed within reference number 2.7.32 above.
Decommissioning phase				
None proposed.				

2.8 Aviation, military and communication

Table 2.8: Aviation, military and communication enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.8.1	Volume 2, chapter 8 – Aviation, Military and Communication	Hornsea Three helicopter operations may affect the available airspace for other users.	Consultation with MOD: Hornsea Three shall continue to consult with the MOD to better understand their aviation lighting requirements to maintain safety in relation to defence aviation activities undertaken in the area.	This is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 8(1) (generation assets) and Schedule 12, Part 2, Paragraph 9(1) (transmission assets) of the DCO.
Operation and maintenance phase				
2.8.2	Volume 2, chapter 8 – Aviation, Military and Communication	Wind turbines and hoist operations will form an aerial obstruction resulting in disruption to cross – zone transit helicopter traffic, and Hornsea Three infrastructure will form an aerial obstruction resulting in disruption to helicopters using HMRs.	Notification of UKHO: The UKHO will be informed of the locations, heights and lighting status of the wind turbines, including estimated and actual dates of construction and the maximum height of any construction equipment to be used, prior to the start of construction, to allow inclusion on Aviation Charts. To comply with CAP 764 (CAA, 2016c). Structures with a maximum height of 300 ft. (91.4 m) above ground level or higher shall be promulgated in the UK AIP and charted on civil aviation charts. Accordingly, any such structure is required to be notified to the Defence Geographic Centre (DGC) who provides the source of obstacle data, published in the UK AIP at ENR 5.4. In addition, the developer shall provide the maximum height of any construction equipment required to build the turbines. Removal of turbines is also required to be notified and expected date of removal. While aviation charts are in the process of being updated, developments shall also be notified through the means of a Notice to Airmen (NOTAM). The CAA also requests that any feature/structure 70 ft. (21.3 m) in height, or greater, above ground level is also reported to the DGC. It should be noted that NOTAMs would not routinely be required for structures under 300 ft. (91.4 m) unless specifically requested by an aviation stakeholder.	The notification is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 5(8) (generation assets) and Schedule 12, Part 2, Paragraph 6(8) (transmission assets) of the DCO.
			Emergency Response and Cooperation Plan (ERCoP): An ERCoP will be in place for the operation and maintenance of Hornsea Three. The ERCoP will detail specific marking and lighting of the wind turbines. The requirements for lighting on offshore obstructions, including to support helicopter hoist operations, is contained in CAP 393 (Article 223) (CAA, 2016a), CAP 764 (CAA, 2016c) and CAP 437 (CAA, 2016b). The lighting shall meet the current CAA requirements and will include: the lighting of boundary turbines, where they are more than 900 m apart, with a single 2,000 candela, red aviation light, flashing Morse 'W' in unison with all other boundary turbines. All other turbines will be fitted with a fixed single red 200 candela aviation light for SAR purposes. Hornsea Three shall continue to consult with the MOD to better understand their aviation lighting requirements.	Emergency response and cooperation plan will be secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 13 (generation assets) and Schedule 12, Part 2, Paragraph 14 (transmission assets) of the DCO.
			Notices to Airmen (NOTAM): During the operational phase, the Hornsea Three operator will issue, as necessary, requests to the UK Aeronautical Information Service to submit NOTAMs in the event of any failure of aviation lighting. This is to comply with CAP 764 (CAA, 2016c) which contains the CAA policy on actions in the event of the failure of aviation warning lights on offshore wind turbines listed in the UK AIP.	Secured by other requirements on aviators.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.8.3	Volume 2, chapter 8 – Aviation, Military and Communication	Hornsea Three helicopter operations may affect the available airspace for other users.	Mitigation detailed within reference number 2.8.1 above.	Means of implementation as detailed within reference number 2.8.1 above.
2.8.4	Volume 2, chapter 8 – Aviation, Military and Communication	Wind turbines will form an aerial obstruction and may disrupt helicopter access to helideck equipped drilling rigs and vessels conducting operations at subsea infrastructure and well locations.	Consultation with oil and gas operators: Hornsea Three will continue to consult with current oil and gas operators and licensees and will consider representations if approached by future oil and gas operators and licensees, in order to promote and maximise cooperation between parties and minimise both spatial and temporal interactions between conflicting activities.	The obligation will be in the PEMMP, which is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO.
Decommissioning phase				
2.8.5	Volume 2, chapter 8 – Aviation, Military and Communication	Hornsea Three helicopter operations may affect the available airspace for other users.	Mitigation detailed within reference number 2.8.1 above.	Means of implementation as detailed within reference number 2.8.1 above.
Monitoring commitments				
Pre-construction and construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

2.9 Marine archaeology

Table 2.9: Marine archaeology enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.9.1	Volume 2, chapter 9 – Marine Archaeology	Construction activities within the Hornsea Three array area and offshore cable corridor causing the removal or disturbance of sediments resulting in a potential effect on near-surface prehistoric land surfaces.	Archaeological input to pre-construction geophysical surveys: Provision by Hornsea Three, of archaeological input into specifications for and ensure archaeological analysis of any further pre-construction geophysical surveys.	A written scheme of archaeological investigation is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(2) (generation assets) and Schedule 12, Part 2, Paragraph 12(2) (transmission assets) of the DCO.
			Archaeological input to pre-construction geotechnical surveys: Provision by Hornsea Three of archaeological input to future geotechnical surveys where deposits of known archaeological potential are likely to be affected. This may include the presence of a geoarchaeologist on board the survey vessel and a provision for sampling, analysis and reporting of recovered cores. Analysis and dating of samples recovered during pre-construction geotechnical surveys in areas where impacts on deposits of geoarchaeological and/or palaeoenvironmental significance seem likely. This would offset the impacts of development on sediments of geoarchaeological/ palaeoenvironmental importance and enhance knowledge of the offshore marine archaeological resource.	
			Pre-construction geotechnical surveys archaeological analysis: Analysis and dating of samples recovered during pre-construction geotechnical surveys in areas where impacts on deposits of geoarchaeological and/or palaeoenvironmental significance seem likely.	
			Archaeological input to pre-construction cable clearance: Archaeologists to be consulted in the preparation of pre-construction cable route clearance or other pre-construction clearance operations and, if appropriate, to carry out watching briefs of such work.	
			Offshore Renewables Protocol for Archaeological Discoveries: Implementation of the Offshore Renewables Protocol for Archaeological Discoveries (Crown Estate, 2010) for unexpected archaeological discoveries made during the course of development.	

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.9.2	Volume 2, chapter 9 – Marine Archaeology	Construction activities within the Hornsea Three array area and offshore cable corridor resulting in a potential effect on shipwrecks and aircraft wrecks.	Archaeological input to pre-construction remotely operated vehicle (ROV)/diver surveys: Hornsea Threes archaeologists to be consulted in the preparation of any pre-construction ROV/diver surveys and, if appropriate, in monitoring/checking of data. To avoid impacts on unrecognised archaeological sites and/or to improve understanding of identified sites of potential archaeological significance. SeaZone/UKHO records classified as 'dead': Investigation of SeaZone/UKHO records classified as 'dead' (where there has been no evidence of a wreck or obstruction over successive surveys) will be undertaken during the future assessment of higher resolution geophysical survey data, with action taken as appropriate. Archaeological Exclusion Zones (AEZs): The identification and implementation of AEZs around those sites identified as having high and medium archaeological potential. Final turbine locations to avoid any known archaeological constraints identified in pre-construction surveys through micrositing. Avoidance of known archaeological constraints: Final turbine locations to avoid any known archaeological constraints identified in pre-construction surveys through micrositing, to avoid direct impacts on sites of identified archaeological significance. Operational awareness of low archaeological potential sites: Where no archaeological significance has been interpreted from the archaeological analysis of the results of the geophysical survey, those sites have been identified as having low archaeological potential. There will be maintenance of an operational awareness of the location of those contacts. Reporting through the agreed protocol will be undertaken should material of potential archaeological interest be encountered. Temporary Archaeological Exclusion Zones (TAEZs): The identification and implementation of TAEZs based on all available information including the stated positional accuracy, the recorded size of the target and the potential archaeological significance around those records for wrecks and obstructions outside of the survey data coverage but within the Hornsea Three boundary. Archaeological input to pre-construction cable clearance: Archaeologists to be consulted in the preparation of pre-construction cable route clearance or other pre-construction clearance operations and, if appropriate, to carry out watching briefs of such work. Preservation by record, stabilisation and/or detailed analysis and safeguarding of comparable sites: Mitigation of unavoidable direct impacts on known sites of archaeological significance: Options include i) preservation by record; ii) stabilisation; iii) detailed analysis and safeguarding of otherwise comparable sites elsewhere. Offshore Renewables Protocol for Archaeological Discoveries: Implementation of the Offshore Renewables Protocol for Archaeological Discoveries (Crown Estate, 2010b) for unexpected archaeological discoveries made during the course of development.	Means of implementation as detailed within number 2.9.1 above.
2.9.3	Volume 2, chapter 9 – Marine Archaeology	Construction of turbines, and substations and accommodation platforms within the Hornsea Three array area with jacket foundations causing the removal or disturbance of sediments resulting in a potential effect on deeply buried prehistoric land surfaces.	Mitigation detailed within reference number 2.9.1 above.	Means of implementation as detailed within number 2.9.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.9.4	Volume 2, chapter 9 – Marine Archaeology	Seabed preparation in connection with gravity base foundation installation and sand wave clearance causing sediment deposition on the seabed resulting in a potential effect on a variety of heritage assets.	Mitigation detailed within reference number 2.9.2 above.	Means of implementation as detailed within reference number 2.9.2 above.
2.9.5	Volume 2, chapter 9 – Marine Archaeology	Cable installation within the Hornsea Three intertidal area may affect buried shipwrecks, navigation poles, jetty revetments or remains or other archaeological evidence for past coastal activities.	Mitigation detailed within reference number 2.9.2 above.	Means of implementation as detailed within reference number 2.9.2 above.
Operation and maintenance phase				
2.9.6	Volume 2, chapter 9 – Marine Archaeology	Maintenance operations which may affect prehistoric land surfaces through the removal or disturbance of sediments.	Mitigation detailed within reference number 2.9.1 above.	Means of implementation as detailed within reference number 2.9.1 above.
2.9.7	Volume 2, chapter 9 – Marine Archaeology	Maintenance operations may affect shipwrecks and aircraft wrecks.	Mitigation detailed within reference number 2.9.2 above.	Means of implementation as detailed within reference number 2.9.2 above.
Decommissioning phase				
2.9.8	Volume 2, chapter 9 – Marine Archaeology	Foundation cutting/removal and cable removal which may affect prehistoric land surfaces through the removal or disturbance of sediments.	Mitigation detailed within reference number 2.9.1 above.	Means of implementation as detailed within reference number 2.9.1 above.
2.9.9	Volume 2, chapter 9 – Marine Archaeology	Foundation cutting/removal and cable removal may affect may affect shipwrecks and aircraft wrecks.	Mitigation detailed within reference number 2.9.2 above.	Means of implementation as detailed within reference number 2.9.2 above.
Monitoring commitments				
Construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

2.10 Infrastructure and other users

Table 2.10: Infrastructure and other users enhancement, mitigation and monitoring commitments: recreational users and recreational fishing.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.11.1	Volume 2, chapter 11 – Infrastructure and Other Users	Hornsea Three infrastructure, safety zones and advisory safety distances associated with activities within the Hornsea Three array area and along the offshore cable corridor may displace recreational craft and recreational fishing vessels resulting in a loss of recreational resource	Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	The notification is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 5(8) (generation assets) and Schedule 12, Part 2, Paragraph 6(8) (transmission assets) of the DCO. An application will be made post-grant of the DCO for a safety zone under section 95 of the Energy Act 2004.
Operation and maintenance phase				
2.11.2	Volume 2, chapter 11 – Infrastructure and Other Users	Hornsea Three infrastructure, safety zones and advisory safety distances associated with infrastructure and maintenance activities within the Hornsea Three array area and along the offshore cable corridor may displace recreational craft and recreational fishing vessels resulting in a loss of recreational resource	Mitigation detailed within reference number 2.11.1 above.	Means of implementation as detailed within reference number 2.11.1 above.
Decommissioning phase				
2.11.3	Volume 2, chapter 11 – Infrastructure and Other Users	Hornsea Three infrastructure, safety zones and advisory safety distances associated with activities within the Hornsea Three array area and along the offshore cable corridor may displace recreational craft and recreational fishing vessels resulting in a loss of recreational resource	Mitigation detailed within reference number 2.11.1 above.	Means of implementation as detailed within reference number 2.11.1 above.
Monitoring commitments				
Construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

Table 2.11: Infrastructure and other users enhancement, mitigation and monitoring commitments: aggregate extraction, cables and pipelines.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.11.4	Volume 2, chapter 11 – Infrastructure and Other Users	Installation of Hornsea Three infrastructure may affect existing cables and pipelines or restrict access to cables and pipelines	Cable crossing agreement: A cable crossing agreement will be established with relevant cable operators. This agreement will include the ability of a cable operator to access their cable during construction if required. If such works are required to occur simultaneously, consultation with the cable operator will be undertaken. To reduce potential conflict at cable crossing locations. Such agreements would likely be based on the templates (OP115) provided by Oil and Gas UK (Oil and Gas UK, 2015a).	This will be secured in the cable crossing agreement.
			Pipeline crossing/proximity agreements: The crossing or laying of marine export cables from Hornsea Three over or adjacent to existing or future pipelines will be subject to pipeline crossing/proximity agreements between Hornsea Three and the pipeline operators, prior to the start of the construction phase. To reduce potential conflict at pipeline crossing locations. Such agreements would likely be based on the templates (OP115) provided by Oil and Gas UK (Oil and Gas UK, 2015a).	This will be secured in the pipeline crossing and/or proximity agreements.
Operation and maintenance phase				
2.11.5	Volume 2, chapter 11 – Infrastructure and Other Users	Safety zones around Hornsea Three infrastructure and advisory safety distances associated with maintenance activities, may lead to a temporary loss of access to existing cables and pipelines for repair or maintenance	Mitigation detailed within reference number 2.11.4 above.	Means of implementation as detailed within reference number 2.11.4 above.
Decommissioning phase				
2.11.6	Volume 2, chapter 11 – Infrastructure and Other Users	Removal of Hornsea Three infrastructure may affect existing cables and pipelines or restrict access to cables and pipelines	Mitigation detailed within reference number 2.11.4 above.	Means of implementation as detailed within reference number 2.11.4 above.
Monitoring commitments				
Construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

Table 2.12: Infrastructure and other users enhancement, mitigation and monitoring commitments: oil and gas operations.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
2.11.7	Volume 2, chapter 11 – Infrastructure and Other Users	Hornsea Three infrastructure, safety zones and advisory safety distances associated with the Hornsea Three array area may restrict potential seismic survey activity	Promulgation of information: Information and warnings will be distributed via Notices to Mariners and other appropriate media (e.g. Admiralty Charts and fishermen's awareness charts) to enable vessels to effectively and safely navigate around the Hornsea Three array area and offshore cable corridor. This may include additional consultation above and beyond the minimum standard required.	Means of implementation as detailed within reference number 2.11.1 above.
			Consultation with oil and gas operators: Hornsea Three will continue to consult with current oil and gas operators and licensees and will consider representations if approached by future oil and gas operators and licensees, in order to promote and maximise cooperation between parties and minimise both spatial and temporal interactions between conflicting activities.	The obligation will be in the PEMMP, which is secured by the DMLs. Refer to Schedule 11, Part 2, Paragraph 11(1)(d) (generation assets) and Schedule 12, Part 2, Paragraph 12(1)(d) (transmission assets) of the DCO
2.11.8	Volume 2, chapter 11 – Infrastructure and Other Users	Drilling and the placement of infrastructure has the potential to be restricted within the Hornsea Three array area and within 1 km from the boundary of the array area by the presence of infrastructure, safety zones and advisory safety distances	Consultation with oil and gas operators: Hornsea Three will continue to consult with current oil and gas operators and licensees and will consider representations if approached by future oil and gas operators and licensees, in order to promote and maximise cooperation between parties and minimise both spatial and temporal interactions between conflicting activities.	Means of implementation as detailed within reference number 2.11.7 above.
2.11.9	Volume 2, chapter 11 – Infrastructure and Other Users	Safety zones around the offshore HVAC booster stations and advisory safety distances associated with activities underway along the offshore cable corridor may restrict potential seismic survey activity	Mitigation detailed within reference number 2.11.7 above.	Means of implementation as detailed within reference number 2.11.7 above.
2.11.10	Volume 2, chapter 11 – Infrastructure and Other Users	Drilling and the placement of infrastructure has the potential to be restricted within the offshore cable corridor and within 1 km from the boundary of the offshore cable corridor	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.
2.11.11	Volume 2, chapter 11 – Infrastructure and Other Users	The piling of wind turbine and substation foundations will generate underwater noise that may acoustically interfere with seismic survey operations	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.
Operation and maintenance phase				
2.11.12	Volume 2, chapter 11 – Infrastructure and Other Users	The presence of infrastructure within the Hornsea Three array area may restrict potential seismic survey activity	Mitigation detailed within reference number 2.11.7 above.	Means of implementation as detailed within reference number 2.11.7 above.
2.11.13	Volume 2, chapter 11 – Infrastructure and Other Users	Drilling and the placement of infrastructure has the potential to be restricted within the Hornsea Three array area and within 1 km from the boundary of the array area by the presence of infrastructure, safety zones and advisory safety distances	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.
2.11.14	Volume 2, chapter 11 – Infrastructure and Other Users	Safety zones around the offshore HVAC booster stations and advisory safety distances associated with maintenance activities underway along the offshore cable corridor may restrict potential seismic survey activity	Mitigation detailed within reference number 2.11.7 above.	Means of implementation as detailed within reference number 2.11.7 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
2.11.15	Volume 2, chapter 11 – Infrastructure and Other Users	Drilling and the placement of infrastructure has the potential to be restricted within the offshore cable corridor and within 1 km from the boundary of the offshore cable corridor	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.
2.11.16	Volume 2, chapter 11 – Infrastructure and Other Users	The presence of new wind turbines in previously open sea areas may cause interference with the performance of the REWS located on oil and gas platforms	Saturn Radar Early Warning System (REWS): It is a condition of the Hornsea Project Two Development DCO to mitigate any adverse impacts from Hornsea Project Two on the Saturn REWS to ensure the safety of the Saturn, Mimas and Tethys platforms. Schedule 1, Part 3, requirement 25 of the Hornsea Project Two DCO requires that construction of any Hornsea Project Two wind turbine may not commence until the Secretary of State, having consulted with ConocoPhillips, is satisfied that appropriate mitigation will be implemented and maintained for the life of Hornsea Project Two. There is very little effect on the REWS located on the Saturn platform from the Hornsea Three turbines due to their distance from the platform. As such, the mitigation measures described for Hornsea Project Two shall reduce the potential for any cumulative effect to arise with Hornsea Three on the ConocoPhillips operated REWS located on the Saturn platform.	The Saturn REWS mitigation is secured by Schedule 1, Part 3, Requirement 25 of the Hornsea Project Two DCO.
			J6A REWS mitigation: Mitigation measures shall be put in place to reduce the effect of Hornsea Three on the REWS on the J6A platform. The mitigation measures will be based on the mitigation measures identified for Hornsea Project Two for the Saturn platform (see row above) and developed in consultation with Spirit Energy. The mitigation shall ensure that the effect of Hornsea Three on the REWS on the J6A platform is reduced to a level that is not significant in EIA terms.	Not currently secured in the DCO.
2.11.17	Volume 2, chapter 11 – Infrastructure and Other Users	Wind turbines and associated infrastructure will form a physical obstruction and may disrupt vessel access to oil and gas platforms and subsea infrastructure	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.
Decommissioning phase				
2.11.18	Volume 2, chapter 11 – Infrastructure and Other Users	Hornsea Three infrastructure, safety zones and advisory safety distances associated with decommissioning of the Hornsea Three array area may restrict potential seismic survey activity	Mitigation detailed within reference number 2.11.7 above.	Means of implementation as detailed within reference number 2.11.7 above.
2.11.19	Volume 2, chapter 11 – Infrastructure and Other Users	Drilling and the placement of infrastructure has the potential to be restricted within the Hornsea Three array area and within 1 km from the boundary of the array area by the presence of infrastructure, safety zones and advisory safety distances.	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.
2.11.20	Volume 2, chapter 11 – Infrastructure and Other Users	Safety zones around the offshore HVAC booster stations and advisory safety distances associated with activities underway along the offshore cable corridor may restrict potential seismic survey activity.	Mitigation detailed within reference number 2.11.7 above.	Means of implementation as detailed within reference number 2.11.7 above.
2.11.21	Volume 2, chapter 11 – Infrastructure and Other Users	Drilling and the placement of infrastructure has the potential to be restricted within the offshore cable corridor and within 1 km from the boundary of the offshore cable corridor.	Mitigation detailed within reference number 2.11.8 above.	Means of implementation as detailed within reference number 2.11.8 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Monitoring commitments				
Construction phase				
None proposed.				
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

3. Onshore Enhancement, Mitigation and Monitoring Commitments

3.1 Geology and ground conditions

Table 3.1: Geology and ground enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.1.1	Volume 3, chapter 1 – Geology and Ground Conditions	To minimise the area of viable mineral resource affected by Hornsea Three.	Ongoing consultation with Norfolk County Council Mineral Planning Authority regarding the Mineral Safeguarding Areas located along the Hornsea Three onshore cable corridor and the onshore HVAC booster station area.	The Code of Construction Practice is secured by Schedule 1, Part 3, Requirement 17 of the DCO.
3.1.2	Volume 3, chapter 1 – Geology and Ground Conditions	To help avoid pollution incidents occurring.	Implement measures to protect groundwater during construction, including good environmental practices based on legal responsibilities and guidance on good environmental management in: guidance in: CIRIA C532 Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (2001); and CIRIA C648 Control of Water Pollution from Linear Construction Projects (2006).	Means of implementation as detailed within reference number 3.1.1 above.
3.1.3	Volume 3, chapter 1 – Geology and Ground Conditions	To help to deal with potentially contaminated land or groundwater and reduce the risk of creating additional / preferential pathways.	A written scheme dealing with contamination of any land and groundwater will be submitted and approved by the Local Authority before any part of the development commences. The scheme will include preliminary risk assessment where appropriate.	The contaminated land and groundwater scheme is secured by Schedule 1, Part 3, Requirement 14 of the DCO.
3.1.4	Volume 3, chapter 1 – Geology and Ground Conditions	To reduce the potential for construction and maintenance activities in or near water to cause serious pollution or impact on the bed and banks of a watercourse and on the quality and quantity of the water.	Minimise where practicable production of silt and contaminated water by minimising for example: • Disturbance of river bed and bank; • Dewatering and pumping of excavations and subsequent disposal of water; • Runoff from exposed ground and stockpiles; • Plant and wheel washing; • Site roads and river crossings; • Fuel spillages; and • Waste storage and disposal. Mitigation in accordance with CIRIA C692 Environmental good practice on site guide (2010).	Means of implementation as detailed within reference number 3.1.1 above.
3.1.5	Volume 3, chapter 1 – Geology and Ground Conditions	To prevent chemical or thermal pollution of principal aquifers and public water supply. To ensure that the construction of the cable does not adversely affect regional groundwater flows and any local changes in flow direction are minimal.	Cable trenching across the SPZ1 areas requires measures to ensure that the principal aquifer is unaffected either directly or indirectly. The depth of superficial deposits would be confirmed via site investigation to ensure works are not undertaken within the chalk aquifer. The site investigation will allow an assessment of the relationship between the aquifer within the superficial deposits and the underlying principal aquifer, to ensure works will not directly impact the principal aquifer. Hydrogeological risk assessment, will be undertaken at each trenchless conduit crossing location within a SPZ. Direct Current cabling to be thermally insulated.	Means of implementation as detailed within reference number 3.1.1 above.
3.1.6	Volume 3, chapter 1 – Geology and Ground Conditions	To prevent chemical or thermal pollution of secondary aquifers. To ensure that the construction of the cable does not adversely affect regional groundwater flows and any local changes in flow direction are minimal.	Cable trenching across areas with secondary A or B aquifers requires measures to ensure the groundwater quality is not adversely affected and that groundwater does not use the trenches as a conduit to convey groundwater elsewhere. Direct Current cabling to be thermally insulated.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.1.7	Volume 3, chapter 1 – Geology and Ground Conditions	To minimise impacts to principal aquifers.	Trenchless conduits for onshore watercourse cable crossing points to be a minimum 2 m below the hard bed of the watercourse subject to site investigation confirming a suitable standoff above the chalk principal aquifer. This is to minimise the risk of "frac-out" and avoid disruption of groundwater flows to surface watercourses. A minimum standoff of 2 m above the chalk aquifer is suggested. Hydrogeological risk assessment), will be undertaken at each trenchless conduit crossing location of a watercourse. A method statement will be prepared for the watercourse crossings in discussion with the EA. The method statement will include details of the proposed trenchless methods, any monitoring to be undertaken and any remedial measure to be put in place. For those crossings identified as highly sensitive (due to interactions with adjacent ecologically designated sites) site specific method statements will be prepared.	Means of implementation as detailed within reference number 3.1.1 above.
3.1.8	Volume 3, chapter 1 – Geology and Ground Conditions	To confirm suitability of geology for HDD techniques. To determine the absence of localised impacted soils and groundwater.	Site investigations will be undertaken at each proposed HDD location during the detailed design stage to confirm local geological conditions. The EA will be consulted on the methodology of the site investigations.	Means of implementation as detailed within reference number 3.1.1 above.
3.1.9	Volume 3, chapter 1 – Geology and Ground Conditions	To prevent contamination of groundwater and mixing of different groundwater units.	Deep trenchless excavations and deep excavations for pile foundations to be mitigated by casing off shallow groundwater units during construction works and sealing off once the casing is removed. Based on guidance in: Piling and Penetrative Ground Improvement Methods on land Affected by Contamination: Guidance on Pollution Prevention (Environment Agency, 2001).	Means of implementation as detailed within reference number 3.1.1 above.
3.1.10	Volume 3, chapter 1 – Geology and Ground Conditions	To minimise ground contamination and prevent contaminated runoff entering surface water or groundwater.	Implement measures to prevent and control spillage of oil, chemicals and other potentially harmful liquids. Ensure appropriate storage and handling of materials and products to include for example: • Avoidance of oil storage within 50 m of a spring, well or borehole; • Within 10 m of a watercourse • Where oil could run over hard ground into a watercourse; • Secondary containment system that can hold at least 110% of the oil volume stored; and • Avoidance of storage of oil in areas at risk of flooding. In accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001. Refuelling of machinery would be undertaken within designated areas where spillages can be easily contained. Machinery would be routinely checked to ensure it is in good working condition; and any tanks and associated pipe work containing oils and fuels would be double skinned and be provided with intermediate leak detection equipment.	Means of implementation as detailed within reference number 3.1.1 above.
3.1.11	Volume 3, chapter 1 – Geology and Ground Conditions	To reduce the risk of soil, surface water and groundwater pollution.	Used oils will be disposed of properly in accordance with Environmental Permitting (England and Wales) Regulations 2016.	Means of implementation as detailed within reference number 3.1.1 above.
Operation and maintenance phase				
3.1.12	Volume 3, chapter 2 – Hydrology and Flood Risk	To reduce the risk of soil, surface water and groundwater pollution.	Operational practices to incorporate measures to prevent pollution of ground, geology and groundwater, to include emergency spill response procedures, clean up and remediation of contaminated soils.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Decommissioning phase				
3.1.13	Volume 3, chapter 1 – Geology and Ground Conditions	To reduce the risk of soil, surface water and groundwater pollution to protect ground and groundwater based on guidance that will be appropriate at the time of decommissioning.	Decommissioning practices to incorporate measures to prevent pollution of geology and ground conditions, to include emergency spill response procedures, and clean up and remediation of contaminated soils. The measures will follow a similar approach to those set out for the construction phase.	The decommissioning programme is secured by Requirement 23 of the DCO.
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.2 Hydrology and flood risk

Table 3.2: Hydrology and flood risk enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.2.1	Volume 3, chapter 2 – Hydrology and Flood Risk	To control surface water run-off from the onshore HVAC booster station and the HVDC converter/HVAC substation in terms of discharge rate and water pollution.	<u>Surface water drainage scheme</u> The proposed development of the onshore HVDC converter/HVAC substation and HVAC booster station will result in the construction of low permeability surfacing, increasing the rate of surface water run-off from the site. A surface water drainage scheme is required to ensure the existing run-off rates to the surrounding water environment are maintained at pre development rates. Outline drainage strategies have been prepared and accompany the flood risk assessments (see volume 6, annex 2.1: Onshore Infrastructure Flood Risk Assessments). The detailed design of the surface water drainage scheme would be based on a series of infiltration/soakaway tests carried out on site and the attenuation volumes outlined in supporting FRAs (volume 6, annex 2.1: Flood Risk Assessment). The tests will be undertaken prior to construction and in accordance with the BRE Digest 365 Guidelines. The strategy will ensure that the current mean annual run-off rate at the onshore HVDC converter/HVAC substation and HVAC booster station is maintained at the current 1 in 1 year run-off rate, and is monitored to ensure that the agreed rate of discharge is maintained. Measures to mitigate against water pollution will also apply to the onshore HVDC converter/HVAC substation and HVAC booster station, and will include measures as set out for the Hornsea Three onshore cable corridor router below to minimise the risk of water pollution.	The surface water drainage scheme is secured by Schedule 1, Part 3, Requirement 15 of the DCO.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.2.2	Volume 3, chapter 2 – Hydrology and Flood Risk	To control flood risk during the construction of the Hornsea Three landfall, onshore cable corridor, construction compounds and haul roads, and to minimise the impact on existing drainage networks and features.	<u>Flood control measures</u> Cable trenching and construction site access road widening across surface water courses will require measures to ensure that the water quality and flow rates are unaffected either directly or indirectly. The Hornsea Three onshore cable corridor and the construction site access roads will be designed to minimise land take and to avoid, where possible, impacts on existing drainage networks and features. The onshore construction compounds and construction access and haul roads would comprise permeable gravel overlying a permeable geotextile membrane of an appropriate standard. Where the Hornsea Three onshore cable corridor crosses smaller watercourses and land drainage ditches measures would be discussed with the relevant stakeholders (e.g. for temporary culvert crossings, appropriately sized flume pipes, equal to or greater than the diameter of the flume upstream and to an agreed length, will be placed on or below the hard bed of the watercourse). An outline method statement for open cut and HDD crossing techniques is contained within the Outline Code of Construction Practice. These method statements will be developed in more detail with the Environment Agency following submission of the Environmental Statement. In some cases, crossing specific method statements will be developed. Cable entry and exit points within transition pits, junction bays and link boxes will be sealed with an appropriate water proofing material to mitigate flood risk. At the Hornsea Three landfall area, construction measures would be adopted to provide the same level of flood protection during construction. These measures would be discussed with the Environment Agency during detailed design. Drainage would be installed either side of the Hornsea Three onshore cable corridor to ensure existing land drainage flow is maintained, and is not altered and channelled by the corridor. Surface water flowing into the trenches during the construction period will be pumped via settling tanks or ponds to remove sediment and potential contaminants, before being discharged into local ditches or drains via temporary interceptor drains. Where gradients on site are significant, cable trenches will include a hydraulic brake (bentonite or natural clay seals) to reduce flow along trenches and hence reduce local erosion. Any field drainage intercepted during the cable installation will either be reinstated following the installation of the cable or diverted to a secondary channel. Any works undertaken will be in agreement with the appropriate stakeholders.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.2.3	Volume 3, chapter 2 – Hydrology and Flood Risk	To prevent pollution of watercourses and address stakeholder concerns for the construction of the onshore elements of Hornsea Three.	<u>Pollution prevention measures</u>: Refuelling of machinery will be undertaken within designated areas where spillages can be easily contained. Machinery will be routinely checked to ensure it is in good working condition. Any tanks and associated pipe work containing oils and fuels will be double skinned and be provided with intermediate leak detection equipment. The following specific mitigation measures for the protection of surface water during construction activities will be implemented: • Management of construction works to comply with the necessary standards and consent conditions as identified by the Environment Agency; • A briefing highlighting the importance of water quality, the location of watercourses and pollution prevention included within the site induction; • Areas with prevalent run-off to be identified and drainage actively managed (e.g. through bunding and/or temporary drainage); • Vegetated strip to be left adjacent to the watercourse during construction; • Bankside vegetation will be reinstated following the construction phase. • Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) to be bunded and carefully sited to minimise the risk of hazardous substances entering the drainage system or the local watercourses. • Additionally the bunded areas will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. Bunds used to store fuel, oil etc. to have a 110% capacity; • Disturbance to areas close to watercourses reduced to the minimum necessary for the work; • Excavated material to be placed in such a way as to avoid any disturbance of areas near to the banks of watercourses and any spillage into the watercourses; • Construction materials to be managed in such a way as to effectively minimise the risk posed to the aquatic environment; • All plant machinery and vehicles to be maintained in a good condition to reduce the risk of fuel leaks; • Drainage works to be constructed to relevant statutory guidance and approved via the LLFA prior to the commencement of construction; and • Consultation with the Environment Agency to be ongoing throughout the construction period to promote best practice and to implement proposed mitigation measures.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.2.4	Volume 3, chapter 2 – Hydrology and Flood Risk	To accord with guidance and best practice for construction works.	<u>Best practice measures</u> All construction work will be undertaken in accordance with the Outline CoCP, and good practice guidance including, but not limited to: • Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C650); • CIRIA – SuDS Manual (CIRIA, 2015); • No discharge to surface watercourses will occur without permission from the Environment Agency (SuDS Manual); • Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual); • Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual); and • A construction method statement to be submitted for approval by the responsible authority (SuDS Manual).	Means of implementation as detailed within reference number 3.1.1 above.
Operation and maintenance phase				
3.2.5	Volume 3, chapter 2 – Hydrology and Flood Risk	To reduce the risk of surface water pollution.	Operational practices to incorporate measures to prevent pollution and increased flood risk, to include emergency spill response procedures, clean up and remediation of contaminated water run-off.	Means of implementation as detailed within reference number 3.1.1 above.
Decommissioning phase				
3.2.6	Volume 3, chapter 2 – Hydrology and Flood Risk	To protect surface water based on guidance that will be appropriate at the time of decommissioning.	Decommissioning practices to incorporate measures to prevent pollution and increased flood risk, to include emergency spill response procedures, and clean up and remediation of contaminated soils. Exposed cables ducts will be sealed with an appropriate water proofing material to mitigate flood risk.	The decommissioning programme is secured by Requirement 23 of the DCO.
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.3 Ecology and nature conservation

Table 3.3: Ecology and nature conservation enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.3.1	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the impact of construction on features of ecology and nature conservation value.	Use of HDD installation method beneath watercourses and designated sites, as detailed below (under Construction measures), including the River Wensum SAC.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.2	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise loss and disturbance of species and habitats.	Where practicable, existing highways or tracks will be used for access to the construction site.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.3	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise loss of habitats of conservation interest.	The Hornsea Three onshore cable corridor has been developed to avoid designated sites, areas of woodland and other ecologically sensitive habitats wherever practicable.	This is secured due to the project being tied to its cable route as per the approved plans.
3.3.4	Volume 3, chapter 3 – Ecology and Nature Conservation		Other VER features such as ponds have been avoided in the selection of the onshore cable corridor alignment and local features such as standard trees and hedgerows have been avoided where it has been practicable to do so.	This is secured due to the project being tied to its cable route as per the approved plans.
3.3.5	Volume 3, chapter 3 – Ecology and Nature Conservation	To reduce impacts on protected or otherwise notable species.	Where practicable, areas identified as containing protected species, including badgers and roosting bats, have been protected by siting the onshore cable corridor alignment to provide an appropriate buffer from construction and operational works. The width of these buffer zones will be developed in accordance with standard industry requirement and best practice guidance, and are expected to be applied for nesting birds, roosting bats, for active badger setts, for otter holts and resting places and for water vole colonies.	Issues related to European Protected species are secured by Schedule 1, Part 3, Requirement 19 of the DCO.
3.3.6	Volume 3, chapter 3 – Ecology and Nature Conservation	To provide up to date information to ensure compliance with legal requirements and, where relevant, trigger the implementation of mitigation measures set out in the Outline CoCP and EMP.	Where necessary, pre-construction surveys, informed by existing data for protected species, will be carried out to identify potential changes in baseline conditions and to survey areas where access was not granted during the survey campaign. These surveys will be undertaken within twelve months prior to the commencement of construction works. Surveys may need to be undertaken over several months in order to collate sufficient data to inform a licence application and any associated mitigation strategy. As the construction of the onshore cable corridor may` be undertaken as a phased programme, surveys will be completed during the appropriate survey season (according to relevant guidance) and in accordance with the construction programme prior to construction. Should the twelve month survey/activity period lapse between pre-construction surveys and the commencement of works, the need to repeat surveys will be assessed by an appropriately experienced ecologist. Should surveys confirm a change in baseline conditions, which result in the need for an EPS licence, a licence will be obtained prior to the commencement of licensable works. Natural England typically requires up to 30 working days to process and consider a licence application and potential amendment requests may result in a longer processing period. Any licenced works will be supervised and/or carried out by an appropriately qualified, experienced and, where necessary, licensed ecologist, in accordance with the licence requirements.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.7	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on Great Crested Newts.	Surveys will include pre-construction surveys (in line with the appropriate methodology to establish presence / absence as per previous surveys) (volume 6, annex 3.5: Great Crested Newt (GCN) Survey) of ponds that were not surveyed during 2017 and any ponds surveyed more than two years prior to construction that are located up to 250 m from the works area, subject to land access agreements, to establish presence/likely absence of GCN. The survey will include an initial HSI assessment to determine the need for presence/absence surveys. If GCN are present, these ponds will be included in the mitigation strategy and if necessary, an EPS licence will be obtained for works to commence. If access to survey is not granted, a worst case scenario will be assumed (i.e. that GCN are present) and these inaccessible ponds will be included in the mitigation plan.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.8	Volume 3, chapter 3 – Ecology and Nature Conservation	To help ensure the protection of reptiles.	Where reptile habitat is required to be cleared for construction, a detailed method statement will be developed in order to help ensure the protection of these species. The method statement will include detailed pre-construction measures designed to ensure that impacts on reptiles are minimised, through relocation of animals from the works corridor and an adjacent buffer zone and post-construction habitat reinstatement. The method statement will include post-construction habitat restoration and management requirements.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.9	Volume 3, chapter 3 – Ecology and Nature Conservation	To help ensure the protection of breeding birds and their young.	Where trees, hedgerows or scrub, of potential value to nesting birds, are required to be cleared for construction, clearance will be undertaken outside of the bird breeding season (14 February to 31 August inclusive) to prevent disturbance to nesting birds where possible. However, if this is not practicable, habitat will be surveyed prior to clearance. No habitat containing an active nest will be removed or disturbed, and measures will be set in place to protect the nest until young have fully fledged and left the nest. Measures may include the establishment of 5 m wide buffer zones in which heavy vehicles will not be tracked and the storage of vehicles, equipment, machinery and soil storage will be prohibited. Works in the buffer zone will be delayed until the Ecological Clerk of Works (ECoW) has confirmed young have fully fledged and left the nest. Ground-nesting birds may be deterred from suitable fields (> 5 ha, open fields) where HDD installation launch pits will be located, using bird scarers during the breeding season (no bird scarers will be employed in February in areas from Kelling to the landfall where wintering pink-footed geese might be affected).	Means of implementation as detailed within reference number 3.1.1 above.
3.3.10	Volume 3, chapter 3 – Ecology and Nature Conservation	To help ensure the protection of badgers.	A pre-construction badger survey of the works area and 30 m buffer zone, or 100 m where HDD installation is to be undertaken, will be undertaken in order to locate any potential new active setts that could cause a constraint to construction. If mitigation cannot be carried out to protect the sett as required under legislation, then a Natural England licence to close or disturb the sett may be required and will be obtained prior to the commencement of works as necessary. Surveys will also be carried out in order to identify signs of high levels of activity, to inform the need for measures described under Construction measures below to be carried out to protect foraging badgers.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.11	Volume 3, chapter 3 – Ecology and Nature Conservation	To help ensure the protection of bats.	A pre-felling check of mature trees will be undertaken to confirm the absence of roosting bats, or a bat roost. Removal or pruning of a tree containing a bat roost, or significant disturbance or obstruction to bats or their roost will require an EPS licence for bats from Natural England, which will be obtained prior to the commencement/continuance of works that could affect the roost.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.12	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the likely impacts on ecology and nature conservation features of interest.	Pre-construction studies will be carried out to identify sensitive habitats in the vicinity of large/sensitive watercourse crossing locations and plans developed for the establishment of associated construction compounds and works sites, to minimise potential impacts.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.13	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the likely impacts on ecology and nature conservation features of interest, including biosecurity measures to prevent spread of invasive species.	All relevant mitigation measures will be implemented through the CoCP. An Outline CoCP accompanies the application for development consent.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.14	Volume 3, chapter 3 – Ecology and Nature Conservation	To help ensure adherence to the ecology mitigation strategy and protection of habitats and species of nature conservation interest.	Site induction and toolbox talks will include mitigation requirements included in this chapter and in the Outline EMP.	Means of implementation as detailed within reference number 3.1.1 above. The Ecological Management Plan is secured by Schedule 1, Part 3, Requirement 10 of the DCO.
3.3.15	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the likely impacts on ecology and nature conservation features of interest.	All works will be carried out taking full account of legislative requirements and EA guidance. Appropriate and adequate measures will be set in place to ensure appropriate levels of dust control to ensure, as far as practicable, that no significant off-site dust effects will occur.	Means of implementation as detailed within reference number 3.3.14 above.
3.3.16	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the risk of collision with animals.	Vehicle speeds will be restricted within the working corridor.	The Construction Traffic Management Plan is secured by Schedule 1, Part 3, Requirement 18 of the DCO.
3.3.17	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise impacts on soil structure and ecology.	Topsoil and subsoil heaps will be located at adequate distances so as to ensure the protection of the retained soils.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.18	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the disturbance impacts of light spill on protected or otherwise notable species.	Night working will be avoided where practicable. However, it may be necessary to carry out works during night time hours, such as during HDD installation operations, or in order to fill transformers with oil and undertake oil processing procedures at the onshore HVDC converter/HVAC substation. Where night working is unavoidable, light fixtures will be directed away from habitat of value to protected or otherwise notable species including badgers, birds and bats, in order to minimise likely disturbance effects of light spillage. Lighting will be kept to an absolute practicable minimum where located nearby to any active badger setts.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.19	Volume 3, chapter 3 – Ecology and Nature Conservation	To retain habitat of value to specialist invertebrate species.	Where individual mature trees are to be felled, sections of dead or decaying wood will be soft-felled (felled in sections) and, where practicable, will be relocated to suitable locations as near to the source tree as practicable, as instructed by the ECoW (i.e. within areas of similar environmental conditions, particularly with regard to shade and groundwater levels, and in locations that will not obstruct the reinstatement of previous land management practices).	Means of implementation as detailed within reference number 3.1.1 above.
3.3.20	Volume 3, chapter 3 – Ecology and Nature Conservation	To ensure works are carried out in accordance with the CoCP and comply with international and national legislation.	An ECoW will be present on site to oversee enabling works and construction where necessary. The ECoW will be a suitably experienced professional ecologist. The ECoW will review results of protected species surveys prior to the commencement of works in different areas and will contribute to all relevant construction method statements.	Means of implementation as detailed within reference number 3.3.14 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.21	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential for pollution incidents to affect habitats.	Further details of measures relating to pollution prevention are set out in volume 3, chapter 2: Hydrology and Flood Risk and are described in the Outline CoCP. Measures will include the provision of a pollution incident response plan and a drainage management plan to minimise potential pollution effects. Measures to be taken during HDD in relation to handling of bentonite, if required, and the requirement for plans to be produced for HDD beneath watercourses (to minimise the risk of pollution) are included in the Outline CoCP.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.22	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the likely impacts on habitats. To mitigate the effects of the temporary loss of hedgerow habitat on species such as bats.	The length of individual hedgerow sections to be removed will be reduced as far as reasonably practicable according to construction methods. A works-free buffer zone will be established around mature trees, of at least equivalent to the root protection zone calculated on a tree-by-tree basis by an appropriately qualified surveyor, and the adjacent cable trench will be set in place where practicable. All sections of hedgerow removed to enable construction of the onshore cable corridor will be replanted as soon as practicable after cable installation, with regard to appropriate planting months. Replacement planting will comprise native shallow-rooting hedgerow species typical of the area. To prevent future root damage to cables, no hedgerow trees will be planted along the Hornsea Three onshore cable corridor. In addition, enhancement planting to improve connectivity and/or native species diversity will be considered on a case by case basis. Enhancement planting will include the planting of native hedgerow trees, typical of the area, at a suitable distance from the onshore cable corridor. A replanting programme to compensate for habitat lost and provide screening will be considered at the proposed HVAC booster station and onshore HVDC converter/HVAC substation sites in conjunction with mitigation measures considered as part of the landscape and visual impact assessment. Planting and management of any reinstated areas will be undertaken in accordance with the Outline EMP. Detailed landscaping proposals will be developed in an outline Landscape Management Plan. Planting will be undertaken as soon as practicable and once it can be confirmed that works will not significantly and adversely affect new planting. Where required, newly planted hedgerows will be protected by adequate fencing until the hedgerow has become established.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.23	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on GCN.	Where considered necessary by the ECoW, or required under an EPS licence obtained from Natural England, amphibian exclusion and drift fencing will be installed along the outer edges of works areas within proximity of a GCN pond. In addition, to take account of the metapopulation dynamics of the species, the exclusion fencing will be extended to segregate any other nearby ponds which are located within 250 m of a GCN pond and which also fall within 250 m of the working corridor, provided there are no significant barriers to dispersal between these ponds and the working corridor (e.g. major roads or rivers).	Means of implementation as detailed within reference number 3.1.1 above.
3.3.24	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on reptiles.	Progressive and careful habitat clearance works such as the gradual strimming of above-ground vegetation such as brambles, rough grass and scrub, will be undertaken in select areas prior to construction, to deter reptiles from the working area where alternative habitat is available to them. Uprooting of vegetation of potential value to hibernating reptiles will be undertaken prior to the commencement of the hibernation period (November to March) to deter reptiles from hibernating in the area.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.25	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential risk of spreading disease and invasive species.	A biosecurity protocol will be implemented to minimise risk of spreading invasive species. The main risks are associated with transfer of aquatic plants or animals (including vectors for disease) between watercourses or waterbodies. The majority of watercourse crossings are being undertaken using HDD, and no ponds are directly affected but where working in or near water, control measures will be implemented. These are documented in the Outline CoCP and include: • Ensuring vehicle tyres and wheel arches are cleared of mud, plants and other organic material before moving from one watercourse to another; • Leaving removed material on site; and • Cleaning boots and disinfecting (away from waterbodies to prevent potential pollutant incidents) all equipment that might come into contact with water. Appropriate measures will also be adopted when working in the vicinity of invasive terrestrial plants. Where necessary, works will be supervised by the ECoW. Known locations of invasive plant species will be marked on site and vehicle movements restricted in the vicinity of these locations. Any spoil containing or likely to contain invasive plant material to be stored separately from non-contaminated spoil, and treated as appropriate, with control measures adopted.	Means of implementation as detailed within reference number 3.1.1 above.
3.3.26	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on water voles and otters.	In addition to measures to minimise the potential for pollution incidents, HDD is proposed for all 'main' and numerous 'ordinary' watercourses, including: • River Glaven headwaters and tributaries; • Blackwater Drain - Booton Common SSSI/Norfolk Valley Fens SAC; • River Wensum SSSI/SAC; • River Tud - Land Adjacent to River Tud CWS; • River Bure; • Swannington Beck; • River Yare; • Low Common CWS; and • Intwood Stream. Other locations for HDD installation include: • Old Hall Meadow CWS; and • Algarsthorpe Meadows Where HDD installation is to be undertaken beneath watercourses supporting water voles or otters, consideration will be given to the location of launch pits and their relationship to watercourses. Works-free buffer zones will be established around sections of the watercourses that support water voles or otters. Buffer zones will prohibit the tracking of heavy vehicles and storage of vehicles, machinery, equipment and soils. Drilling is expected to achieve at least 1.5 m beneath any watercourses. Where considered necessary by the ECoW, high visibility fencing will be erected between the watercourses and adjacent riparian habitat and the works areas to prevent access by workers and heavy machinery, and also to prevent storage of equipment or materials within this zone. To prevent water voles and other animals from becoming trapped in the HDD installation pits, exclusion fencing will be installed around HDD installation pits where considered necessary by the ECoW.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.27	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on water voles.	Taking into account the mobile nature of water voles, pre-construction surveys will be undertaken to confirm the presence/absence of water voles along all watercourses of potential value to water voles. Method statements will include pre-construction measures to deter water voles from the working corridor and an adequate buffer zone (i.e. up to 15 m where favourable habitat is present). Measures could potentially include: • Removal of vegetation from channel and bank-side vegetative cover, up to a minimum of 1.5 m inland from the top of the bank between mid-February and early April; • The potential capture and translocation of water voles from working areas by an appropriately qualified and experienced ecologist; • A destructive search of water vole burrows within the working corridor under the watching brief of an appropriately qualified and experienced ecologist; and • Measures to protect adjacent sections of the watercourse, which will not be directly impacted by trenching, such as marking out on the ground the boundary of the Hornsea Three onshore cable corridor, to control the movement of personnel and vehicles. Works will be conducted in accordance with Natural England guidance, which states that "*for summer works, vegetation removal should be carried out for a two week period prior to development. Winter works should either carry out the mitigation in September and maintain unsuitable habitat until the works commence, or in the event of an emergency, trapping and vole proof fencing may have to be employed*" (Arnott, 2001). Works will also take into account best practice guidelines published in Strachan *et al.* (2011).	Issues related to European Protected species are secured by Schedule 1, Part 3, Requirement 19 of the DCO.
3.3.28	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on otters.	Cable installation by HDD beneath watercourses of value to otters will be carried out. HDD installation pits and other excavations will be covered overnight to prevent otters entering the areas, or a method of escape (such as a plank to act as a ladder) will be provided where such excavations cannot be covered or filled on a nightly basis. Works-free buffer zones will be set up around holts (if found) and any other identified resting place, within which no tracking of heavy machinery, or storage of equipment, machinery or soils will be permitted. If night time works take place, lighting will be focussed on the works areas and away from watercourses of potential value to otters. Lighting will be kept to a minimum where it might affect holts or other identified resting places. Vehicle speeds will be limited whilst on site so as to minimise the potential for animals to be injured by vehicles. Where considered necessary by the ECoW, high visibility fencing will be erected around works-free zones. No below-ground destructive works, or tracking of heavy machinery will be undertaken a minimum distance from known otter holts. If pre-construction otter surveys report the presence of a previously unidentified otter holt or resting place within the Hornsea Three onshore cable corridor or works areas, or close enough to result in the potential disturbance of otters and if re-routing or amendments to the location of working areas are not practicable, it may be necessary to remove a holt or resting site or exclude otters from works areas using temporary otter fencing. An EPS licence for otters obtained from Natural England will be required to remove an otter holt or resting place, and may be required if works will result in disturbance and/or displacement. Advice will be sought from an experienced otter ecologist and Natural England as to the requirement for an EPS licence, prior to the commencement of works.	Means of implementation as detailed within reference number 3.3.14 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.29	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impacts on badgers.	In addition to the above-mentioned measures, including those to control vehicle speeds and minimise the likely impacts of light spillage: • No construction works will be carried out within minimum distances of an active sett entrance. Works within 30 m of a badger sett entrance may require a Natural England licence for badgers. Protection zones will be marked out on site, such as with high-visibility fencing or coloured tape; • Areas of high badger activity, if identified, will be cordoned off to ensure these are kept fully intact and with minimal interference from construction; • Excavations more than 0.5 m deep will be fenced or covered overnight where practicable, or if this is not practicable, a method of escape (e.g. a plank to act as a ladder) will be provided; and Large diameter pipes will be capped at the end of each working day to reduce the potential for badgers and other animals to enter them and become trapped.	Means of implementation as detailed within reference number 3.3.14 above.
3.3.30	Volume 3, chapter 3 – Ecology and Nature Conservation		If work within minimum distances of a sett and, therefore, sett closure or disturbance cannot be avoided, sett closures will need to be carried out outside the badger breeding season (defined as 30 November to 1st July) and in accordance with a Natural England approved method statement and, where relevant, a Natural England licence for badgers. HDD installation launch pits will be located minimum distances from active badger setts, or a Natural England licence for badgers may be required prior to the commencement of works, as considered necessary by an experienced badger ecologist. Toolbox talks on badgers will be provided by the ECoW to all construction staff on site and an emergency procedure protocol will be given to contractors in the event of encountering a badger or discovering a sett. If new setts are identified within minimum distances of the Hornsea Three onshore cable corridor, or in the areas around the HDD installation launch sites, micro-siting away from the setts will be undertaken where practicable within the consented boundary of development, or a Natural England licence for badgers may be required before works continue.	Means of implementation as detailed within reference number 3.3.14 above.
3.3.31	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impact on bats.	In addition to measures described above to minimise the impacts of pollutants, including airborne pollutants and light spillage, additional measures to ensure works do not result in the killing, injury or disturbance of bats are included in the Outline CoCP. These measures include: • The creation of a minimum buffer zone between cable trenches and any bat roosts identified during surveys; • If the surveys, or subsequent surveys identify the presence of additional bat tree roosts which will require removal to enable installation of the cable, this will be carried out under an EPS licence for bats obtained from Natural England; and Use of temporary 'artificial bridges' to provide a link between severed edges of hedgerows and other habitat crossed by the Hornsea Three onshore cable corridor, which have been identified as key commuting/foraging routes. The artificial bridges will be retained in situ throughout the construction period and until replacement planting has established and developed sufficiently to create a continuous connecting habitat. The bridges will be put into place at the end of each working day and will be retained in situ during the day when not working in the area.	Means of implementation as detailed within reference number 3.3.14 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.32	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the period of time that habitats and species will be affected.	Post construction - reinstatement of damaged or cleared terrestrial habitat will be carried out as soon as practicable. Habitat reinstatement will involve the replacement of stripped soils and the planting of native hedgerows, shrubs and trees, typical of the local area and of local provenance where possible. The construction of buildings and planting of trees with deep roots will not be permitted above the onshore cable corridor to prevent potential damage to cabling. Habitat reinstatement will be undertaken in accordance with a pre-approved Landscape Management Plan. The scheme will include the retention and/or replacement of habitats of nature conservation value wherever practicable.	Means of implementation as detailed within reference number 3.3.14 above.
3.3.33	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise the potential impact on bats.	Bat habitat and bat roost creation, restoration or enhancement, with the aim of providing proportionate replacement for habitat lost or damaged, for example: • Erection of long-lasting woodcrete bat boxes on nearby retained mature trees to provide immediate potential roost sites as mitigation for lost tree holes of potential value to roosting bats; • Replacement hedgerow planting, or 'gapping up' of hedgerows along the route, including the planting of scattered native hedgerow trees where practicable; hedges with trees are greatly preferred by bats. Tree planting will provide potential long-term roosting opportunities; and Securing the long-term establishment and maintenance of replacement habitat in accordance with the landscape mitigation measures.	Means of implementation as detailed within reference number 3.3.14 above.
Operation and maintenance phase				
3.3.34	Volume 3, chapter 3 – Ecology and Nature Conservation and Outline Ecological Management Plan (document reference A8.6)	To protect retained habitats and species.	The measures to be adopted for the avoidance of pollution of the environment during the operation of the onshore infrastructure are set out in volume 3, chapter 2: Hydrology and Flood Risk.	The Ecological Management Plan is secured by Schedule 1, Part 3, Requirement 10 of the DCO.
3.3.35	Volume 3, chapter 3 – Ecology and Nature Conservation and Outline Ecological Management Plan (document reference A8.6)	To ensure the success of habitat/landscaping proposals.	Habitats will be managed in accordance with the EMP and the agreed Landscape Management Plan.	Means of implementation as detailed within reference number 3.3.34 above.
Decommissioning phase				
3.3.36	Volume 3, chapter 3 – Ecology and Nature Conservation	To minimise likely impacts on habitats and species of ecological or conservation interest.	Measures to be adopted during decommissioning will be similar to those adopted during construction and will incorporate best practice guidance available at that time. These will be implemented through a decommissioning plan.	The decommissioning programme is secured by Requirement 23 of the DCO.
Monitoring commitments				
Construction phase				
3.3.37	Volume 3, chapter 3 – Ecology and Nature Conservation and Outline Ecological Management Plan (document reference A8.6)	To monitor potential for open cut trenching and installation to cause loss of hedgerow habitat	An assessment of the success of restoration of habitats such as hedgerows, comprising visits in years 1, 3 and 5 after planting to identify any planting failures that require reinstatement or other remedial works.	Means of implementation as detailed within reference number 3.3.34 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.3.38	Volume 3, chapter 3 – Ecology and Nature Conservation and Outline Ecological Management Plan (document reference A8.6)	To monitor potential disturbance to protected species	Pre-construction surveys will be undertaken for protected species (a part of licence requirements) and also for areas where access was not granted during the original programme of surveys. The aim of the surveys is to provide up to date species data (particularly relevant for "mobile" species such as badgers) and to confirm the details of the mitigation measures to be implemented. Where construction is undertaken in two-phases, and the works are undertaken under separate protected species licences, the pre-construction surveys may have to be repeated. If construction work on functionally linked sugar beet fields is likely to take place between November and January inclusive, a pink-footed goose mitigation plan will be formulated and submitted to Natural England for approval in the 12 months prior to construction. This will include details of a survey of the distribution and abundance of pink-footed geese and the distribution of harvested sugar beet within those sections of the Hornsea Three onshore cable corridor (and a 500m disturbance buffer) likely to be affected during the winter season within which works will take place (see the Report to Inform Appropriate Assessment (document reference number 5.2).	Means of implementation as detailed within reference number 3.3.34 above.
Operation and maintenance phase				
None proposed.				
Decommissioning phase				
None proposed.				

3.4 Landscape and visual resources

Table 3.4: Landscape and visual resources enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.4.1	Volume 3, chapter 4 – Landscape and Visual Resources	To reduce the impact of the project upon existing landscape features.	The location of the onshore cable corridor avoids as many landscape features as possible (e.g. areas of woodland).	Secured by design and that corridor is secured by plans.
3.4.2	Volume 3, chapter 4 – Landscape and Visual Resources	To reduce the potential landscape and visual impact of Hornsea Three	The onshore cable corridor will be buried underground for its entire length	Secured by design and that corridor is secured by plans.
3.4.3	Volume 3, chapter 4 – Landscape and Visual Resources	To reduce the potential landscape and visual impact of Hornsea Three.	The location of the onshore HVAC booster station is closely associated with existing woodland.	The provision of landscaping is secured by Schedule 1, Part 3, Requirements 8 and 9 of the DCO.
.3.4.4	Volume 3, chapter 4 – Landscape and Visual Resources	To reduce the potential landscape and visual impact of Hornsea Three and help integrate it into the landscape. To enhance existing hedgerows and biodiversity.	An OLMP has been produced and will followed. The OLMP contains illustrative landscape proposals including minimising removal of existing vegetation and implementation of mitigation planting for the onshore HVAC booster station and onshore HVDC/HVAC substation. It also details management of the proposed planting to enable the proposed planting to thrive.	Means of implementation as detailed within reference number 3.4.3 above.
3.4.5	Volume 3, chapter 4 – Landscape and Visual Resources and the Outline Landscape Management Plan (document reference A8.7).	Mitigation for hedgerows removed. Shallow rooted plants only over the onshore cable corridor to prevent disturbance of the cables by tree roots.	Replacement hedgerow planting along the onshore cable corridor (where practical) with shallow rooted shrubs. The OLMP describes how hedgerows will be replaced and maintained along the onshore cable corridor.	Means of implementation as detailed within reference number 3.4.3 above.
3.4.6	Volume 3, chapter 4 – Landscape and Visual Resources and the Outline Landscape Management Plan (document reference A8.7).	Enhancement of landscape character, visual resources and ecological habitats. Trees not replanted over the onshore cable corridor to prevent disturbance of the cables by tree roots.	Gapping up of derelict hedgerows that are impacted upon by the construction phase (where practical). Increasing diversity in species-poor hedgerows. Replacement tree planting, on a one for one basis within hedgerows, not over the cables, of any trees removed during the construction works. The OLMP describes how hedgerows and trees will be protected, enhanced and maintained along the onshore cable corridor.	Means of implementation as detailed within reference number 3.4.3 above.
3.4.7	Volume 3, chapter 4 – Landscape and Visual Resources	Mitigation and enhancement of landscape character and visual resources.	Restoration and repair of gates and fences that have been removed/damaged during the construction works.	Means of implementation as detailed within reference number 3.4.3 above.
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Decommissioning phase				
None proposed				

3.5 Historic environment

Table 3.5: Historic environment enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.5.1	Volume 3, chapter 5 – Historic Environment	This reduces or nullifies any long-term effect on the settings of heritage assets.	Cables will be buried rather than above ground.	Secured by design and that corridor is secured by plans.
3.5.2	Volume 3, chapter 5 – Historic Environment	To offset any loss of, or damage to, buried archaeological assets.	A programme of advance archaeological investigation following consent will focus on identified sites that will be adversely affected by Hornsea Three. Targeted geophysical survey and trial trenching will be undertaken in other areas of the onshore cable corridor as appropriate. A WSI will be agreed with the relevant authorities prior to commencement of the consented works.	Secured by Schedule 1, Part 3, Requirement 15 of the DCO.
3.5.3	Volume 3, chapter 5 – Historic Environment	To offset any loss of, or damage to, buried archaeological assets	Investigation of unexpected archaeological sites encountered during construction will be undertaken in line with procedures (e.g. a chance find procedure) agreed in advance with the relevant authorities (see outline CoCP).	Means of implementation as detailed within reference number 3.5.2 above.
3.5.4	Volume 3, chapter 5 – Historic Environment	This reduces any long-term effects on the settings of heritage assets and the historic landscape.	Restoration of hedges and hedge banks (for more detail see chapter 3: Ecology and Nature Conservation). Landscape planting scheme around onshore HVAC booster station and HVDC converter/HVAC substation (see Outline LMP).	The provision of landscaping is secured by Schedule 1, Part 3, Requirements 8 and 9 of the DCO.
3.5.5	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. The Hornsea Three onshore cable corridor passes between the two recorded heritage assets just west of Baconsthorpe Castle. Potential that previously unrecorded archaeological remains continue through this area.	Site GS2 - Baconsthorpe: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction	Means of implementation as detailed within reference number 3.5.2 above.
3.5.6	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. No recorded or known archaeology, including from the geophysical survey (see Annex 5.6). However, given the impact of the proposed permanent structures a programme of mitigation works is judged to be appropriate.	Site GS5 - Barningham Green, onshore HVAC booster station: Trenching/ soil stripping as appropriate in advance of construction and/ or monitoring of soil stripping during construction	Means of implementation as detailed within reference number 3.5.2 above.
3.5.7	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. A small number of discrete and linear responses of uncertain origin have been identified through the geophysical survey (see Annex 5.6). Metal detecting within these fields has produced significant quantities of Roman and early Anglo-Saxon artefacts indicating a high potential for associated buried archaeological remains.	Site GS6 - Corpusty: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.8	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Significant quantities of medieval finds suggest medieval settlement	Site GS7 – Saxthorpe: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.9	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. St Michael and All Angels' Church, medieval coin finds and Roman road.	Site GS10 - Booton: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.10	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Cropmarks of ditches of possible Iron Age to Roman date and finds including tesserae.	Site GS 11 – Alderford: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.5.11	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Cropmarks of Bronze Age round barrow cemetery.	Site GS12 - Attlebridge/Morton on the Hill: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.12	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Site of probable Bronze Age barrow.	Site GS13 – Ringland: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.13	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. High potential for significant buried archaeological deposits relating to Anglo-Saxon to medieval settlement.	Site GS14 – Easton: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.14	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. The cropmarks of an area of enclosures and fields of probable Roman date.	Site GS15 - Broom Farm: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.15	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. High potential for significant buried archaeological deposits relating to Anglo-Saxon to medieval settlement.	Site GS16 - Little Melton: Area subject to geophysical survey now outside Hornsea Three project boundary. However, trenching/soil stripping would be undertaken as appropriate within a nearby part of the onshore cable corridor in advance of construction and/or monitoring of soil stripping during construction (and see Site GS23).	Means of implementation as detailed within reference number 3.5.2 above.
3.5.16	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Cropmark of Bronze Age ring ditch.	Site GS17 – Ketteringham: Area subject to geophysical survey now outside Hornsea Three project boundary. However, trenching/ soil stripping would be undertaken as appropriate within a nearby part of onshore cable corridor in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.17	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Historic Environmental Record (HER) records cropmarks of an undated rectangular enclosure at the proposed onshore HVDC converter/HVAC substation. Permanent structures and relatively large area of high impact.	Site GS18 - Mangreen South: Trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.18	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. High potential for significant buried archaeological deposits relating to Anglo-Saxon to medieval settlement	Site GS19 – Mangreen Hall – geophysical survey as appropriate of areas within the Hornsea Three project boundary in advance of construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.19	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Cropmarks of a ring ditch and linear features (possible enclosures).	Site GS24 – Edgefield - – geophysical survey as appropriate of areas within the Hornsea Three project boundary in advance of construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.18	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Presence of an enclosure cropmark of possible Iron Age to Roman date within 50 m of onshore cable corridor. Consequently, there is a high potential for associated buried archaeological remains.	Reroute Online Map 2 - Bodham (TF 113 395 area): Geophysical survey and/ or trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction.	Means of implementation as detailed within reference number 3.5.2 above.
3.5.19	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. Previously unrecorded cropmarks, including boundary/enclosure ditches and a possible ring ditch, are visible in this field on Google Earth imagery from 1999..	Reroute Online Map 2 - Bodham (TF 115 391 area) Geophysical survey and/ or trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction	Means of implementation as detailed within reference number 3.5.2 above.
3.5.20	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. A small number of discrete and linear responses of uncertain origin have been identified through the geophysical survey (see volume 6, annex 5.6: Onshore Geophysical Survey Report). The onshore cable corridor runs along the line of a parish boundary that is also recorded as a cropmark feature. The presence of a parish boundary may increase the potential for an early Anglo-Saxon cemetery to be present and this needs to be considered in the future mitigation works.	Site GS23 Reroute Online Map 7 - Great Melton/Little Melton (TG 147 070 area): Further geophysical survey and/ or trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction (and see Site GS16).	Means of implementation as detailed within reference number 3.5.2 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.5.21	Volume 3, chapter 5 – Historic Environment	To minimise impact on undesignated heritage assets. The onshore cable corridor passes through an area of Roman finds and consequently there is potential for buried archaeological remains to be present.	Reroute Online Map 8 - Hethersett (TG 167 058 area): Geophysical survey and/ or trenching/soil stripping as appropriate in advance of construction and/or monitoring of soil stripping during construction	Means of implementation as detailed within reference number 3.5.2 above.
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.6 Land use and recreation

Table 3.6: Land use and recreation enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.6.1	Volume 3, chapter 6 – Land Use and Recreation	To ensure that the individual soil types and soil profiles are stripped, stored and restored.	The identification and management of the soil materials on the site (the different soil types present, their likely physical characteristics and ALC have been identified by survey work undertaken).	Means of implementation as detailed within reference number 3.1.1 above.
3.6.2	Volume 3, chapter 6 – Land Use and Recreation	To prevent mixing of soil materials which can reduce overall soil quality.	Separate stripping and storage of identified topsoil and subsoil resources.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.3	Volume 3, chapter 6 – Land Use and Recreation	To prevent damage to and losses of soil materials.	Location of topsoil and subsoil heaps so as to avoid cross-contamination of materials and the trafficking of soil heaps by construction traffic.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.4	Volume 3, chapter 6 – Land Use and Recreation	To prevent damage to and losses of soil materials.	Maintenance of topsoil and subsoil heaps in order to reduce potential losses of soil materials during the length of storage.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.5	Volume 3, chapter 6 – Land Use and Recreation	To reduce potential soil damage through handling in unsuitable conditions.	Control of the timing of soil handling operations.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.7	Volume 3, chapter 6 – Land Use and Recreation	To reduce potential soil damage through the inappropriate use of machinery.	Choice of soil handling machinery and method for its use, in order to reduce potential for soil compaction and soil damage.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.8	Volume 3, chapter 6 – Land Use and Recreation	To enable the land to be handed back to the landowner in a suitable condition.	Implementation of appropriate soil aftercare following reinstatement.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.9	Volume 3, chapter 6 – Land Use and Recreation	To ensure that recognised good practice is effectively implemented on site.	Careful supervision of soil handling operations on site.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.10	Volume 3, chapter 6 – Land Use and Recreation	To provide suitable detailed soil handling guidance that can be implemented effectively on site.	Implementation of a Soil Management Strategy.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.11	Volume 3, chapter 6 – Land Use and Recreation	To limit, as far as possible, the length of time land is out of agricultural production.	After construction has been completed on a length of Hornsea Three onshore cable corridor, the associated construction compounds and side accesses will be promptly dismantled and the land restored.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.12	Volume 3, chapter 6 – Land Use and Recreation	To reduce potential disruption of soil drainage in areas beyond the construction corridor.	The maintenance and reinstatement, where reasonably practicable, of existing water supplies, irrigation facilities and drainage systems during the construction process.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.13	Volume 3, chapter 6 – Land Use and Recreation	To allow the continued management of severed fields throughout the construction.	The maintenance of access routes across individual fields, where reasonably practicable, where these are severed during construction.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.14	Volume 3, chapter 6 – Land Use and Recreation	To enable the continued operation of farm holdings during the construction process.	The maintenance of farm access routes, wherever reasonably practicable, between fields within a farm holding.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.15	Volume 3, chapter 6 – Land Use and Recreation	To ensure that livestock are kept out of construction areas.	Appropriate fencing of the onshore construction cable corridor during construction, dependent upon the nature of the individual farm holding affected.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.16	Volume 3, chapter 6 – Land Use and Recreation	To reduce, as far as possible, the risk for the spread of animal and plant diseases.	Appropriate construction practices to be implemented to ensure that the potential risk for the spread of animal and plant diseases is reduced as far as practicable.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.6.17	Volume 3, chapter 6 – Land Use and Recreation	To reduce, as far as practicable, impacts on farming and ongoing activities on the land affected.	Timing of construction works, where feasible, to minimise disruption to landowners/farming practice, through agreement with landowners.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.18	Volume 3, chapter 6 – Land Use and Recreation	To minimise the effects on these recreational resources during construction.	Construction method statements will be prepared in consultation with the relevant asset owner or interested parties (e.g. tenant) in relation to the Hornsea Three onshore cable corridor crossings of receptors such as the Rivers Bure, Wensum and Yare and the North Norfolk Railway, which are also recreational resources.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.19	Volume 3, chapter 6 – Land Use and Recreation	To ensure the safe passage of NMUs during construction and maintain NMU routes, including those along local highways.	An outline Construction Traffic Management Plan accompanies this application (document reference number A8.2) and will be developed further during detailed design stage in consultation with the relevant highway authority to document measures to manage construction traffic. This will include measures where there is an interface between non-motorised users and construction traffic such as separation of construction traffic and non-monitored users (NMUs), speed restrictions, and localised traffic control measures (e.g. traffic lights, deployment of banksmen).	Means of implementation as detailed within reference number 3.3.16 above.
3.6.20	Volume 3, chapter 6 – Land Use and Recreation	To minimise the effects on the PRoW network and maintain access for pedestrians and other NMUs along public highways and PRoW during construction and following the completion of construction works. To ensure the safety and separation of NMUs and construction traffic.	A Public Rights of Way Management Plan will be prepared in consultation with the relevant public rights of way officer at each local authority. This plan will be under the umbrella of, and secured through, the CoCP. This will include specific measures to be adopted to mitigate the temporary effects of the construction works including the following (see the Outline CoCP which accompanies this application): • Measures dealing with the management of beach access; • Installation of fencing to ensure clear separation between areas accessed by the public and the construction works; • The maintenance of NMU access along PRoWs crossed by the Hornsea Three onshore cable corridor or the provision of a temporary diversion; • Provision of signage to inform and direct NMUs; • The widths of crossing points and temporary diversions will generally be between 2 m and 4 m wide; and • Following completion of construction activities all public access will be reinstated to a standard commensurate to that existing prior to the commencement of construction works. PRoW affected during the construction phase of the works would be crossed by either HDD or by open trench. When HDD is utilised, the PRoW would remain open during the duration of construction. Where open trenching is used to cross PRoW, the routes would either be temporarily stopped up/diverted or traffic management measures would be put in place in some locations to maintain access. Where such measures cross a bridleway, all material used would be suitable for use by horses.	Means of implementation as detailed within reference number 3.1.1 above.
3.6.21	Volume 3, chapter 6 – Land Use and Recreation	To ensure local authorities and the public are kept informed of when and where works will be taking place to the PRoW network.	An outline communication plan has been developed as part of the Outline CoCP. This includes the use of appropriate media (signage/leaflets/notices) to inform residents, parish councils and visitors of temporary changes to the PRoW network arising from the onshore construction works for Hornsea Three. For example, warning notices will be erected at key points where PRoW are affected by the Hornsea Three onshore cable corridor works to make users aware of the construction working area and associated construction noise. The local newspaper will also carry such information.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.6.22	Volume 3, chapter 6 – Land Use and Recreation	To minimise the temporary disturbance to sensitive receptors including recreational facilities and PRoW during the construction period.	The Outline CoCP includes measures to control and limit noise and vibration levels, so far as is reasonably practicable. Information of noise generating activities will be posted at relevant points where members of the public may pass the construction works e.g. at a PRoW crossing point.	Means of implementation as detailed within reference number 3.1.1 above.
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.7 Traffic and transport

Table 3.7: Traffic and transport enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.7.1	Volume 3, chapter 7 – Traffic and Transport	To avoid adverse effects on communities and road users.	Suitable HGV routes have been identified.	Means of implementation as detailed within reference number 3.3.16 above.
3.7.2	Volume 3, chapter 7 – Traffic and Transport	To ensure that construction traffic has no lasting adverse impact on the condition of highways.	Video condition surveys will be undertaken before the start of works and after the substantial completion of works on minor links used by HGVs to access the Hornsea Three onshore cable corridor. Damage to the highway caused by construction traffic will be repaired.	Means of implementation as detailed within reference number 3.3.16 above
3.7.3	Volume 3, chapter 7 – Traffic and Transport	To avoid damage to inappropriate highways, to minimise delays and risks to road users and to avoid adverse impacts on local communities.	A route for abnormal loads will be identified between the SRN and the relevant onshore infrastructure (i.e. HVAC booster station and HVDC convertor/HVAC substation). The route, timing and method of transport of abnormal loads will be discussed and agreed with Highways England, the police and relevant highways and bridge authorities.	Means of implementation as detailed within reference number 3.3.16 above
3.7.4	Volume 3, chapter 7 – Traffic and Transport	It is expected that in some circumstances working hours could be extended when this would reduce the magnitude of environmental impacts of construction (e.g. to increase safety, reduce driver delays, reduce the duration of impacts etc.).	Working Hours are established in the Outline CoCP (document reference number A8.5). These are likely to be 07.00 to 18.00 on weekdays and 07.00 to 13.00 on Saturdays and for the HDD at landfall and other sites are proposed to be 24 hours, seven days a week during drilling, contingent on ground conditions. Other activities that will require 24 hour operation will be: site security, oil filling of transformers at the HVDC converter/HVAC substation, some work at jointing pits, some HDD activities and possible remedial works in response to severe weather events. These will be agreed in consultation with the relevant planning authorities	Means of implementation as detailed within reference number 3.1.1 above.
3.7.5	Volume 3, chapter 7 – Traffic and Transport	To minimise adverse impacts on local communities and vulnerable highway users.	Restrictions on HGV operating hours, along those sections of the highway network that provide access to local schools.	Means of implementation as detailed within reference number 3.3.16 above
3.7.6	Volume 3, chapter 7 – Traffic and Transport	To minimise adverse impacts on local communities and vulnerable highway users.	Restrictions on HGV operating hours and measures to minimise the number of HGV movements through sensitive areas when access to HDD sites is essential.	Means of implementation as detailed within reference number 3.3.16 above
3.7.8	Volume 3, chapter 7 – Traffic and Transport	To eliminate risks to highway users resulting from mud and debris on the highway.	Wheel washing at all site access points where it is necessary to eliminate the risk of mud and debris on the local road network.	Means of implementation as detailed within reference number 3.1.1 above.
3.7.9	Volume 3, chapter 7 – Traffic and Transport	To reduce vehicle speeds, improve driver awareness of construction activity and to minimise any potential road safety issues arising.	The progression of Temporary Traffic Regulation Orders for a temporary 30 mph speed restriction at every site access which does not already have such a speed limit.	Means of implementation as detailed within reference number 3.3.16 above
3.7.10	Volume 3, chapter 7 – Traffic and Transport	To minimise adverse air quality effects (see volume 3, chapter 9: Air Quality).	Measures to minimise dust and dirt associated with the movement of construction vehicles.	Means of implementation as detailed within reference number 3.3.16 above
3.7.11	Volume 3, chapter 7 – Traffic and Transport	To eliminate risks associated with inappropriate parking.	The provision of appropriate parking facilities for construction workers.	Means of implementation as detailed within reference number 3.3.16 above
3.7.12	Volume 3, chapter 7 -Traffic and Transport	To minimise delays to existing highway users and to maintain highway safety.	Traffic management measures at those points where cable trenches are cut across highways or where existing access rights are affected.	Means of implementation as detailed within reference number 3.3.16 above
3.7.13	Volume 3, chapter 7 – Traffic and Transport	Closure of rights of way minimise risks to members of the public resulting from construction works. Diversions minimise delays and inconvenience to pedestrians, cyclists and equestrians.	The diversion of footways or any other rights of way that may be affected by the construction works with closures only when absolutely necessary (see volume 3, chapter 6: Land Use and Recreation).	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.7.14	Volume 3, chapter 7 – Traffic and Transport	To minimise the impact on sensitive receptors.	Monitor load sizes and vehicle usage and, where possible, load consolidation and delivery to construction sites using alternative vehicles. Encouragement to re-use HGVs wherever possible, such as backloading. Where practical, local suppliers will be used to minimise the distance travelled by HGVs.	Means of implementation as detailed within reference number 3.3.16 above
3.7.15	Volume 3, chapter 7 – Traffic and Transport	To minimise overall emissions and to minimise other traffic and transport impacts.	Where possible the appointed contractor should seek to minimise overall vehicle movement generation through measures to encourage and promote sustainable travel and transport, for example by using a minibus to shuttle staff between key pick up locations and the compounds (main compound and secondary compounds)	Means of implementation as detailed within reference number 3.3.16 above
3.7.16	Volume 3, chapter 7 – Traffic and Transport	To minimise highway risk and possible delays.	Local management of vehicle movements to minimise the risks of vehicles meeting each other on narrow sections.	Means of implementation as detailed within reference number 3.3.16 above
3.7.17	Volume 3, chapter 7 – Traffic and Transport	To maintain highway safety.	The design of HGV access points, including visibility standards and, where necessary, temporary speed restrictions on the adjacent highway will be agreed with the relevant Highway Authorities.	Means of implementation as detailed within reference number 3.3.16 above
3.7.18	Volume 3, chapter 7 – Traffic and Transport	To ensure the ongoing safe and efficient functioning of the highway.	At all vehicle accesses where accommodation works are undertaken to allow the movement of vehicles between the Hornsea Three onshore cable corridor and the highway the original highway will be reinstated after construction work is completed.	Means of implementation as detailed within reference number 3.3.16 above
3.7.19	Volume 3, chapter 7 – Traffic and Transport	To minimise the impact on sensitive receptors.	For HDD crossings, the drilling/auguring compound is anticipated to receive a greater number of HGV movements than that receiving compound. Wherever practical, the drilling/auguring direction will be set so as to minimise the number of HGV movements through sensitive receptors.	Means of implementation as detailed within reference number 3.1.1 above.
3.7.20	Volume 3, chapter 7 – Traffic and Transport	To minimise disruption and driver delay.	It is expected that a number of abnormal loads comprising large components such as transformers will be transported to the HVDC converter/HVAC substation site. The haulage contractor appointed to undertake this work will be required to comply with statutory regulations in terms of consulting with Highways England, police and Local Highway Authorities. The notification requirements differ depending on the weight, length and width of the abnormal load.	Means of implementation as detailed within reference number 3.3.16 above
3.7.21	Volume 3, chapter 7 – Traffic and Transport	To minimise disruption and driver delay.	The timing of abnormal load deliveries will be discussed with the relevant highway authorities to minimise delay for other road users and to minimise risk to highway users. The timing of abnormal load deliveries to the HVDC converter/HVAC substation will be discussed to ensure that there is no adverse impact on the access road in terms of delays to vehicles using the site.	Means of implementation as detailed within reference number 3.3.16 above
3.7.22	Volume 3, chapter 7 – Traffic and Transport	To minimise disruption and driver delay.	The routeing of abnormal load deliveries will be agreed with the relevant highway authorities. The delivery of abnormal loads would typically be undertaken in convoy and under escort. Where abnormal loads require the full width of the carriageway or for unusual manoeuvres at junctions, appropriate temporary road closures and traffic management will be put in place as appropriate to maintain the safety of other road users.	Means of implementation as detailed within reference number 3.3.16 above
3.7.23	Volume 3, chapter 7 – Traffic and Transport	This is to minimise the impacts of construction vehicle movements associated with Hornsea Three and to manage those movements in a manner that road safety is maintained.	A CTMP will form part of the Code of Construction Practice and will be secured through a requirement of the Development Consent Order for Hornsea Three. An outline CTMP is submitted with the DCO (document reference A8.2). Once a main contractor or contractors has/have been appointed the CTMP or CTMPs will be agreed with the relevant planning authorities in consultation with the highway authority and Highways England.	Means of implementation as detailed within reference number 3.3.16 above

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.7.24	Volume 3, chapter 7 – Traffic and Transport	To seek to minimise any disruption during these periods.	Depending on the times of construction of individual Hornsea Three onshore cable corridor sections, HGVs will avoid tourist routes where possible during peak holiday season, the periods of which will be consulted on with Norfolk County Council and Highways England.	Means of implementation as detailed within reference number 3.3.16 above
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.8 Noise and vibration

Table 3.8: Noise and vibration enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.8.1	Volume 3, chapter 8 – Noise and Vibration	To minimise noise and vibration, where reasonably practicable.	Best Practicable Means (BPM), for example the use of quieter alternative methods, plant and/or equipment, where reasonably practicable; the use of site hoardings, enclosures, acoustic barriers, portable screens and/or screening nosier items of plant, where reasonably practicable; and maintaining and operating all vehicles, plant and equipment in an appropriate manner, to ensure that extraneous sound from mechanical vibration, creaking and squeaking is kept to a minimum.	Means of implementation as detailed within reference number 3.1.1 above.
3.8.2	Volume 3, chapter 8 – Noise and Vibration	To ensure compliance with local authority requirements.	Construction noise management measures for specific construction activities will be agreed with the relevant local authorities prior to the start of construction and added to the CoCP.	Means of implementation as detailed within reference number 3.1.1 above.
3.8.3	Volume 3, chapter 8 – Noise and Vibration	To ensure no significant operational noise effects caused by the onshore HVDC converter/HVAC substation.	Mitigation will be developed during the detailed design stage of the onshore HVDC converter/HVAC substation to achieve a noise rating level not exceeding 34 dB $L_{Ar,Tr}$ at any surrounding residential NSR.	Means of implementation as detailed within reference number 3.1.1 above.
Operation and maintenance phase				
3.8.4	Volume 3, chapter 8 – Noise and Vibration	To ensure compliance with local authority requirements.	Prior to the start of noise generating works an Operational Noise Management Plan (NMP) will be agreed with the relevant local planning authority.	See Schedule 1, Part 3, Requirement 21 – Control of noise during operational phase.
Decommissioning phase				
None proposed				
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.9 Air quality

Table 3.9: Air quality enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.9.1	Volume 3, chapter 9 – Air Quality	To facilitate community engagement and a proactive approach to complaints regarding nuisance dusts.	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information.	Means of implementation as detailed within reference number 3.1.1 above.
3.9.2	Volume 3, chapter 9 – Air Quality	To document controls to prevent or control the generation and release of nuisance dusts during construction.	Develop and implement a Dust Management and Monitoring Plan (DMMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the 'highly-recommended' measures in the IAQM guidance. The 'desirable' measures should be included as appropriate for the site. The DMMP may also include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	Means of implementation as detailed within reference number 3.1.1 above.
3.9.3	Volume 3, chapter 9 – Air Quality	To facilitate community engagement and a proactive approach to complaints regarding nuisance dusts.	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book. Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	Means of implementation as detailed within reference number 3.1.1 above.
3.9.4	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during construction.	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period. Avoid site runoff of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. Cover, seed or fence stockpiles to prevent wind whipping.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.9.5	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during construction.	Avoid bonfires and burning of waste materials.	Means of implementation as detailed within reference number 3.1.1 above.
3.9.6	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during construction.	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Only remove the cover in small areas during work and not all at once.	Means of implementation as detailed within reference number 3.1.1 above.
3.9.7	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during construction.	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	Means of implementation as detailed within reference number 3.1.1 above.
3.9.8	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during construction.	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record all inspections of haul routes and any subsequent action in a site log book. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access gates to be located at least 10 m from receptors where possible.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
3.9.9	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during construction	Ensure all vehicles switch off engines when stationary – no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. Implement a CTMP to ensure the efficient movement of traffic during the construction and decommissioning phase of Hornsea Three. An outline CTMP is submitted as part of the Hornsea Three application (document reference A8.2). Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	Means of implementation as detailed within reference number 3.1.1 above. The Construction Traffic Management Plan is secured by Schedule 1, Part 3, Requirement 18 of the DCO.
Operation and maintenance phase				
None proposed				
Decommissioning phase				
3.9.10	Volume 3, chapter 9 – Air Quality	To minimise generation of nuisance dusts during demolition	Soft-strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. Avoid explosive blasting, using appropriate manual or mechanical alternatives. Bag and remove any biological debris or damp down such material before demolition.	Means of implementation as detailed within reference number 3.1.1 above.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Monitoring commitments				
Construction phase				
3.9.10	Volume 3, chapter 9 – Air Quality	To verify the effective control of dust releases at the site.	*Monitoring* Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the site boundary, with cleaning to be provided if necessary. Carry out regular site inspections to monitor compliance with the DMMP, record inspection results, and make an inspection log available to the local authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	Means of implementation as detailed within reference number 3.1.1 above.
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

3.10 Socio-economics

Table 3.10: Socio-economics enhancement, mitigation and monitoring commitments.

Reference	Cross reference to Environmental Statement	Environmental effect	Enhancement, mitigation and monitoring commitments	Means of implementation
Enhancement and mitigation commitments				
Construction phase				
3.10.1	Volume 3, chapter 10 – Socio-economics	Increase the level socio-economic benefit captured in the Local Study Area.	Identify opportunities for companies to access supply chain opportunities. Identify opportunities for local people to access employment associated with Hornsea Three.	Local skills plan secured by Schedule 1, Part 3, Requirement 22 of the DCO.
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				
Monitoring commitments				
Construction phase				
None proposed				
Operation and maintenance phase				
None proposed				
Decommissioning phase				
None proposed				

4. References

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