

Appendix referred to in response to EL12 – Mitigation Measures / DCO Requirements Table

Appendix S to the Response submitted for Deadline I

Application Reference: EN010053

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Designed-in mitigation measure	Method of securing mitigation measure
Design measures	
Use of trenchless installation method beneath coastal sand dunes and major watercourses, as detailed below (under <i>Construction measures</i>).	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice. DCO Requirement 16: Prohibited access.
Where practicable, existing highways or tracks will be used for access to the construction site.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
The cable route corridor has been sited to avoid areas of woodland and the location of the landfall has been sited to avoid saltmarsh. Other VER features such as ponds and local wildlife sites have been avoided in the selection of the cable route alignment and local features such as standard trees have been avoided where it has been practicable to do so.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
Where practicable, areas identified as containing protected species, including badgers and roosting bats, have been protected by siting the cable route alignment to provide an appropriate buffer from construction and operational works. The width of these buffer zones are: for nesting birds 5 m, roosting bats 15 m, for active badger setts 30 m for cable trenching and 100 m for trenchless installation, for otter holts and resting places 50 m for trenching and 100 m for trenchless installation, and for water vole colonies 15 m for trenching and 50 m for trenchless installation.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
The cable route corridor has been adjusted in response to the identification of a water vole colony at Team Gate Drain, to the north-west of Waltham in North East Lincolnshire, to reduce the likelihood of disturbance during construction. The original proposed route ran parallel to the drain (within 30 m) for approximately 800 m. The current route, after crossing the drain by trenchless installation, has been diverted to run parallel to Team Gate Drain at approximately 300 m.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
Pre-construction measures	
Pre-construction surveys, informed by existing data for protected species, will be carried out to identify potential changes in baseline conditions. These surveys will be undertaken within twelve months prior to the commencement of 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 cable route will 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 six 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 a Natural England European Protected Species (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.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.

Surveys will include pre-construction surveys of ponds that were not surveyed during 2011/2012 and any ponds surveyed more than two years prior to construction that are located up to 500 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.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
Designed-in mitigation measure	Method of securing measure
Where trenchless installation will be undertaken across a watercourse where water voles have been recorded, a detailed method statement will be developed in order to help ensure the protection of water voles. The method statement will be agreed with Natural England prior to the commencement of works. The method statement will include detailed pre-construction measures designed to deter and/or relocate water voles from the works corridor and an adjacent buffer zone. The method statement will include post-construction habitat restoration and management requirements, with a planting list favourable to water voles.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
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. 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 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 trenchless installation launch pits will be located, using bird scarers.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
A pre-construction badger survey of the works area and 30 m buffer zone, or 100 m where trenchless 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.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
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.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
Construction measures	
All relevant mitigation measures will be implemented through a Code of Construction Practice (see Outline CoCP, Doc ref No 12.4) and Ecological Management Plan (See Outline EMP, Doc ref No 12.5), which will be pre-approved by the LPAs.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
Site induction and toolbox talks will include mitigation requirements included in this chapter and the Outline EMP.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
All works will be carried out taking full account of legislative requirements and EA guidance.	DCO Requirement 7: Ecological management plan landward of mean low water springs.

Appropriate and adequate measures will be set in place to ensure appropriate levels of dust control so no significant off-site dust effects will occur.	DCO Requirement 8: Code of Construction Practice. DCO Requirements Schedule L: Protective Provisions (Part 1).
Vehicle speeds will be restricted within the working corridor.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
Designed-in mitigation measure	Method of securing measure
Heavy machinery will not be tracked on waterlogged soils or over stored soils. Soil storage areas will be located at adequate distances so as to ensure the protection of the retained soils.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
At the landfall, cable installation will be by trenchless method beneath the sea defences and sand dunes.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
At the landfall, cable installation will be by trenchless method beneath the area of saltmarsh.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
At the landfall the access road along the crest of the sea defences will not be used during installation of the ducts and cables beneath the sea defences. The construction vehicular side access routes are shown in Volume 4 Annex 4.3.4: Crossing Schedule (Onshore) (Doc ref No 7.4.3.4). The drain inland of the sea defences will be culverted and the vehicle track will run across the culvert and over the top of the sea defences and onto the intertidal area. The track will then run parallel with the sea defences in the intertidal zone to meet the intertidal construction corridor. Measures will be set in place to minimise the impact of tracking vehicles on the sand dunes and intertidal zone.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice. DCO Requirements Schedule L: Protective Provisions (Part 1).
Night working will be avoided where practicable. However it may be necessary to carry out works during night time hours, such as during trenchless installation operations and cable pulling, 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 within 30 m of an active badger sett.	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.
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 ground water-levels, and in locations that will not obstruct the reinstatement of previous land management practices).	DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.

<p>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.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice. DML B2 Condition 10(2)(c)(viii). DML A2 Condition 10(2)(c)(viii).</p>
<p>Further details of measures relating to pollution prevention will be described in the outline CoCP and are discussed in Volume 3, Chapter 2: Hydrology and Flood Risk (Doc ref No 7.3.2). Measures will include the provision of a pollution incident response plan and a drainage management plan to minimise potential pollution effects.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
<p>Designed-in mitigation measure</p>	<p>Method of securing measure</p>
<p>The length of individual hedgerow sections to be removed will be reduced as far as reasonably practicable according to construction methods and, with regard to cable installation by open-cut trenching this will be up to 30 m. A works-free buffer zone of at least 15 m between mature trees, or 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. The cable trench will be located approximately 10 m from retained hedgerows. All sections of hedgerow removed to enable construction of the cable route 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 cable route. In addition, enhancement planting to improve connectivity and/or native species diversity will be undertaken within a 100 m wide corridor encompassing the cable route. Enhancement planting will include the planting of native hedgerow trees, typical of the area, at a suitable distance from the cable route. A replanting programme to compensate for habitat lost and provide screening will be carried out at the proposed onshore HVDC converter/HVAC substation site, where up to approximately 600 m of hedgerow and 4019 m² of linear woodland will be removed, Planting and management of reinstated areas will be undertaken in accordance with an Outline EMP. Detailed landscaping proposals are provided in the Outline LSMP. Planting will be undertaken as soon as practicable and once it could 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.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice. DCO Requirement 9: Landscaping. DCO Requirement 10: Implementation and maintenance of landscaping.</p>
<p>Where considered necessary by the ECoW, or required under an EPS licence obtained from NE, amphibian exclusion and drift fencing will be installed along the outer edges of works areas that fall within 250m 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 ponds which are located within 250m of a GCN pond and which also fall within 250m 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).</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
<p>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.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>

<p>In addition to measures to minimise the potential for pollution incidents, trenchless installation will be undertaken at Laceby Beck, North Beck Drain and Team Gate Drain.</p> <p>Where trenchless installation is to be undertaken beneath watercourses supporting water voles, (including known colonies at Team Gate Drain, North Beck Drain and Laceby Beck), launch pits will be located at least 50 m from the watercourses. Works-free buffer zones of at least 10 m in width will be established around sections of the watercourses that support water voles. Buffer zones will prohibit the tracking of heavy vehicles and storage of vehicles, machinery, equipment and soils.</p> <p>Drilling will be at least 1.5 m beneath any drains known to support water voles.</p> <p>Open-cut trenching across watercourses known to support water voles will be undertaken in accordance with the NE approved method statement. Where considered necessary by the ECoW, high visibility fencing will be erected between the drains 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 from becoming trapped in the trenchless installation pits, exclusion fencing will be installed around trenchless installation pits where considered necessary by the ECoW.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
<p>Designed-in mitigation measure</p>	<p>Method of securing measure</p>
<p>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.</p> <p>Where water vole activity has been / is recorded along watercourses to be crossed by open-cut installation, construction and installation works will be carried out in accordance with a detailed method statement developed so as to protect water voles against injury, death and significant disturbance.</p> <p>Method statements will include pre-construction measures to deter water voles from the working corridor and an adequate buffer zone (i.e. up to 15m where favourable habitat is present). Measures could include:</p> <ul style="list-style-type: none"> ▪ <i>Removal of vegetation from channel and bank-side vegetative cover, up to a minimum of 1.5m inland from the top of the bank between mid-February and early April;</i> ▪ <i>The potential capture and translocation of water voles from working areas by an appropriately qualified and experienced ecologist;</i> ▪ <i>A destructive search of water vole burrows within the working corridor under the watching brief of an appropriately qualified and experienced ecologist; and</i> ▪ <i>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 cable route corridor, to control the movement of personnel and vehicles.</i> <p>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" (English Nature, 2001) Works will also take into account best practice guidelines published in Strachan <i>et al.</i>, 2011).</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
<p>In addition to measures to minimise the potential for pollution incidents, cable installation will be undertaken by trenchless installation beneath Laceby Beck, which is of value to otters. Trenchless installation pits, other excavations and ducts 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.</p> <p>Trenchless installation launch pits will be located at a minimum of approximately 100 m from known otter holts, and construction compounds and storage areas will be located approximately 50 m from any otter holts. Works-free buffer zones of 50 m in width will be set up around the holt and any other identified resting place, within which no tracking of heavy machinery, or storage of equipment, machinery or soils will be permitted.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>

<p>In addition to the above-mentioned measures, including those to control vehicle speeds and minimise the likely impacts of light spillage:</p> <ul style="list-style-type: none"> ▪ <i>No construction works will be carried out within 30 m of an active sett entrance. Where this is not practicable, works within 30 m of a badger sett entrance may require a Natural England licence for badgers. 30m wide protection zones will be marked out on site, such as with high-visibility fencing or coloured tape;</i> ▪ <i>Areas of high badger activity will be cordoned off to ensure these are kept fully intact and with minimal interference from construction;</i> ▪ <i>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</i> ▪ <i>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.</i> 	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
Designed-in mitigation measure	Method of securing measure
<p>If work within 30 m of a sett and therefore, sett closure or disturbance cannot be avoided, this will need to be carried out outside the badger breeding season (defined as 30 November to 1 July) and in accordance with a Natural England approved method statement and where relevant a Natural England licence for badgers.</p> <p>Trenchless installation launch pits will be located at least 100 m 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.</p> <p>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 30 m of the cable route corridor, or within 100 m of the trenchless installation launch sites, micrositing 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.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
<p>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 will be included in the outline CoCP. These measures will include:</p> <ul style="list-style-type: none"> ▪ <i>The creation of a 15 m buffer zone between cable trenches and the known bat roost, identified during the 2011 bat surveys (Volume 6 Annex 3.7);</i> ▪ <i>If the 2012 survey, 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.</i> <p><i>Use of temporary artificial bridges' to provide a link between severed edges of hedgerows and other habitat crossed by the cable route 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.</i></p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 8: Code of Construction Practice.</p>
Post-construction	

<p>In accordance with the requirements of the Outline EMP, areas affected by the northern access route across the sand dunes to be fenced for a two to three year period. Annual post-construction monitoring of recolonizing sand dune vegetation in affected areas to be undertaken over a two to three year period. (Potential for southern access route, if created, to be retained as permitted access route, as agreed with Natural England).</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs.</p>
<p>Reinstatement of damaged or cleared terrestrial habitat will be carried out as soon as practicable. Habitat reinstatement in consultation with Local Planning Authorities will involve the replacement following cable installation, of stripped soils and the planting of native hedgerows, shrubs and trees, typical of the local area and of local provenance where possible. Agricultural habitats will be reinstated. The construction of buildings and planting of trees with deep roots will not be permitted above the cable systems to prevent potential damage to cabling. Habitat reinstatement will be undertaken in accordance with a pre-approved Outline LSMP. The scheme will include the retention and/or replacement of habitats of nature conservation value wherever practicable.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 9: Landscaping. DCO Requirement 10: Implementation and maintenance of landscaping.</p>
<p>Designed-in mitigation measure</p>	<p>Method of securing measure</p>
<p>Bat habitat and bat roost creation, restoration or enhancement, with the aim of providing proportionate replacement for habitat lost or damaged, for example:</p> <ul style="list-style-type: none"> ▪ <i>Erection of long-lasting Schwegler 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;</i> ▪ <i>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</i> ▪ <i>Securing the long-term establishment and maintenance of replacement habitat in accordance with the landscape mitigation measures.</i> 	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs.</p>
<p>Post-construction restoration of affected watercourses will be carried out to reinstate banks to their previous condition, and ensure suitable for water voles.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 9: Landscaping. DCO Requirement 10: Implementation and maintenance of landscaping.</p>
<p>Operational phase measures</p>	
<p>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 (Doc ref No 7.3.2).</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs.</p>

<p>Habitats should be managed in accordance with the OEMP and the outline Landscape Scheme and Management Plan (OLSMP) (Doc ref No 12.9).</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 9: Landscaping. DCO Requirement 10: Implementation and maintenance of landscaping.</p>
<p><i>Decommissioning phase measures</i></p>	
<p>Measures to be adopted during decommissioning will be similar to those adopted during construction and will incorporate best practice guidance available at the time.</p>	<p>DCO Requirement 7: Ecological management plan landward of mean low water springs. DCO Requirement 11: Decommissioning.</p>