# East Anglia TWO Offshore Windfarm

## Outline Watercourse Crossing Method Statement

Applicant: East Anglia TWO Limited
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**Applicable to**

**East Anglia TWO**

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# Glossary of Acronyms

| | |
|---|---|
| BBPP | Breeding Bird Protection Plan |
| CCS | Construction Consolidation Site |
| DCO | Development Consent Order |
| ECoW | Ecological Clerk of Works |
| ES | Environmental Statement |
| EU | European Union |
| HGV | Heavy Goods Vehicle |
| IDB | Internal Drainage Board |
| LLFA | Lead Local Flood Authority |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |
| WFD | Water Framework Directive |

# Glossary of Terminology

| | |
|---|---|
| Applicant | East Anglia TWO Limited |
| East Anglia TWO project | The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure. |
| European site | Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas. |
| Hundred River crossing | Any works taking place within 8m of the Hundred River channel and its banks |
| Jointing bay | Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts. |
| Mitigation areas | Areas captured within the onshore Development Area specifically for mitigating expected or anticipated impacts. |
| Onshore cable corridor | The corridor within which the onshore cable route will be located. |
| Onshore cable route | This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas. |
| Onshore cables | The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables. |
| Onshore development area | The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located. |
| Trenchless technique | A method of installation that allows ducts and cables to be installed under an obstruction or area without breaking open the ground and digging a trench (examples of such techniques include horizontal directional drilling, thrust boring, auger boring and pipe ramming). |
| Watercourse | All rivers, streams, creeks, ditches, drains, canals, cuts, culverts, dykes, sluices, sewers and passages through which water flows except a public sewer or drain. |

# 1 Introduction

## 1.1 Overview

1. This Outline Watercourse Crossing Method Statement forms part of a set of documents that support the Development Consent Order (DCO) application (the Application) submitted by East Anglia TWO Limited (the Applicant) for the East Anglia TWO project (the Project).

2. Works to be undertaken within the onshore development area include (amongst other things) the construction of onshore cables, which comprise up to six electrical cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.

3. The onshore cable route will cross a number of 'watercourses', defined in the ***draft DCO*** (~~REP5-003~~AS-109) as including *"all rivers, streams, creeks, ditches, drains, canals, cuts, culverts, dykes, sluices, sewers and passages through which water flows except a public sewer or drain."*

4. The onshore cable route crosses only one Main River as classified by the Environment Agency - the Hundred River, as shown in ***Figure 1, Appendix 1***. Any other watercourses crossed by the onshore cable route are classed as Ordinary watercourses for the purposed of this Outline Watercourse Crossing Method Statement.

5. Given the spatial and environmental constraints at the Hundred River crossing, the Hundred River can only be crossed by an open trench technique. Further details on why a trenchless technique is not considered feasible is included in ***Appendix 2*** (for the purpose of this Outline Watercourse Crossing Method Statement only). Whilst the Hundred River is not subject to an ecological designation in its own right, the lower reaches of the Hundred River flow through the Leiston – Aldeburgh Site of Special Scientific Interest (SSSI) and Sandlings Special Protection Area (SPA).

6. This Outline Watercourse Crossing Method Statement focuses on the Hundred River crossing and presents an overview of the information to be presented within the final Watercourse Crossing Method Statement for this crossing, such as construction information, environmental considerations and ecological mitigation measures associated with the Hundred River crossing.

7. The final Watercourse Crossing Method Statement will also include details of the methods for other crossings which fall within the definition of 'watercourse' in the ***draft DCO*** (~~REP5-003~~AS-109) (i.e. Ordinary watercourses).

## 1.2 Watercourse Crossing Method Statement

8. Requirement 22 of the ***draft DCO*** (~~REP5-003~~AS-109) states:

*22.(1) No stage of the onshore works may commence until for that stage a code of construction practice (which must accord with the outline code of construction practice) has been submitted to and approved by the relevant planning authority.*

*22.(2) The code of construction practice must include—*

*(a) …*

*(k) a watercourse crossing method statement (which accords with the outline watercourse crossing method statement); and;*

*22.(3) The code of construction practice approved in relation to the relevant stage of the onshore works must be followed in relation to that stage of the onshore works.*

9. The final Watercourse Crossing Method Statement must accord with this Outline Watercourse Crossing Method Statement[1] and will provide details of the chosen method of crossing the Hundred River and associated mitigation measures.

10. This Outline Watercourse Crossing Method Statement secures commitments made in the Environmental Statement (ES) and during the pre-examination and examination stages of the Application relating to the crossing of the Hundred River and presents an outline of the detail that will be incorporated within the final Watercourse Crossing Method Statement.

## 1.3 Construction Scenarios

11. In accordance with the ***Project Update Note*** submitted at Deadline 2 (REP2-007), the Applicant has committed that should both the Project and the East Anglia ONE North project be consented and then built sequentially, when the first project goes into construction, the ducting for the second project will be installed along the whole of the onshore cable route in parallel with the installation of the onshore cables for the first project. This will include installing ducting at the

[1] This is included within the ***draft DCO*** (REP5-003)).

Hundred River crossing for both the Project and East Anglia ONE North project at the same time.

12. It is envisaged that when the second project moves into the construction phase, the only construction works required at the Hundred River crossing will be the undertaking of duct integrity testing, cleaning and dewatering of ducts and repair (if required) and the pulling of electrical cables through the pre-installed cable ducts. Other works such as construction of jointing bays for the jointing of onshore cables will be located outside of the Hundred River crossing or beyond the extent of Flood Zone 2 where possible (whichever is the furthest extent from the river channel).

13. By making this commitment, there will no longer be a scenario whereby both the Project and East Anglia ONE North project install ducts completely independently of each other along the onshore cable route.

## 1.4 Sandlings SPA / Leiston – Aldeburgh SSSI

14. The Sandlings SPA is a European site designated under the European Union Directive on the Conservation of Wild Birds due its European ornithological importance for its breeding populations of nightjars and woodlarks. The SPA also supports both acid grassland and heather-dominated plant communities, with dependant invertebrate and the abovementioned bird communities of conservation value. Under the Directive, the United Kingdom has a duty to safeguard the habitats of migratory birds and certain specified species which, in the context of the Sandlings SPA, are nightjar and woodlark.

15. The Leiston – Aldeburgh SSSI is a nationally designated site which meets the published selection criteria for national designation. The SSSI contains viable areas of coastal vegetated shingle, a habitat type listed in Annex I of the EU Habitats Directive ('perennial vegetation of stony banks'). It supports a unique range of flora and fauna that are adapted to the harsh conditions that are present at such locations. Bird species which regularly breed on the SSSI include nightjar, woodlark and skylark within dry grassland and heath habitat, and tree pipit, turtle dove, bullfinch and nightingale within scrub and woodland areas.

16. ***Appendix 3*** includes copies of the citations for the Sandlings SPA and Leiston – Aldeburgh SSSI. The conservation objectives for the Sandlings SPA are, with respect to its qualifying features (nightjar and woodlark), set out in ***Appendix 4*** and are as follows:

*"[To] ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;*

- *The extent and distribution of the habitats of the qualifying features;*
- *The structure and function of the habitats of the qualifying features;*
- *The supporting processes on which the habitats of the qualifying features rely;*
- *The population of each of the qualifying features; and*
- *The distribution of the qualifying features within the site".*

17. Whilst the Hundred River is not subject to an ecological designation, its lower reaches flow through the Leiston – Aldeburgh SSSI and Sandlings SPA. Therefore, the Applicant has developed outline design and mitigation measures associated with the Hundred River crossing in order to protect the SPA and SSSI downstream of the works.

18. To address comments made by Natural England at Deadline 4 (REP4-092) regarding potential impacts arising from works associated with the crossing of the Hundred River upon downstream ecological features, the Applicants have undertaken a Habitats Regulations Assessment provided as ***Appendix 5*** of this ***Outline Watercourse Crossing Method Statement***.

# 2 Baseline Conditions

## 2.1 Hundred River Catchment

19. The Hundred River has a surface water catchment area of approximately 26km$^2$ (see ***Figure 2, Appendix 1***). The river rises near East Green, from where it flows south towards Knodishall and Coldfair Green. From here, it flows in a south-easterly direction towards the coast. The river flows to the south of The Meare at Thorpeness (to which it is connected via a sluice), from where it flows southwards along the landward edge of the coastal dune system until it discharges to the sea via a sluice to the south of The Haven. The wider Hundred River catchment contains the majority of the onshore cable corridor.

20. The Hundred River is typical of lowland, low energy drainage systems that have been extensively modified historically (potentially to facilitate drainage of surrounding wet floodplain habitats so that they can be used for agriculture).

21. The Hundred River has a naturally gently meandering planform, although there is considerable evidence of localised straightening. As a result of these modifications, in such areas the watercourse typically has a uniform trapezoidal channel with steep to near vertical banks. Where unmodified, the banks are typically shallow, stable and well vegetated, although there is evidence of toe scour in parts of the catchment. Considerable areas of in-channel vegetation growth are also apparent. The channels are largely dominated by depositional processes, reflecting the low energy of the system, with natural silt beds and evidence of considerable fine sedimentation along the channel margins. Flows are typically low, and the upper reaches of the watercourse (upstream of the proposed cable crossing) were dry at the time of the walkover survey undertaken in July 2018. Water levels are much deeper in the lower reaches of the river, which is likely to reflect the impounding and tide-locking influence of the sluice through which the river enters the sea.

## 2.2 Water Quality

22. Data presented on the Environment Agency's Catchment Data Explorer indicate that water quality in the Hundred River is relatively poor, with low concentrations of dissolved oxygen and elevated concentrations of phosphates (Environment Agency 2016), as shown in ***Table 2.1***. High levels of phosphates are attributed by the Environment Agency (2016) to the input of treated wastewater effluent into the watercourse, while low levels of dissolved oxygen are attributed to naturally low flows. However, no other contaminants that are monitored under the Water Framework Directive are noted in the Environment Agency data.

**Table 2.1 Water Framework Directive (WFD) Status of the Hundred River (Physico-chemical Parameters)**

| Parameter | 2019 Classification |
|---|---|
| **Physico-chemical Quality Elements** | Moderate |
| **Ammonia** | High |
| **Dissolved oxygen** | Bad |
| **pH** | High |
| **Phosphates** | Moderate |

23. ***Plate 2.1*** to ***Plate 2.3*** below show the Hundred River within the vicinity of the Hundred River crossing (photography taken December 2020).

**Plate 2.1 Hundred River looking south**

**Plate 2.2 Hundred River looking south**

**Plate 2.3 Hundred River Looking North (Hundred River to left of post and wire fencing)**

## 2.3 Flood Risk

24. The majority of the onshore cable route is located within Flood Zone 1 as defined by the Environment Agency online Flood Map for Planning (***Figure 20.3.1*** (APP-496)) and confirmed by data obtained from the Environment Agency in August 2018.

25. Environment Agency flood zone maps (Environment Agency 2020) indicate that the location where the onshore cable route crosses the Hundred River has a higher risk of flooding (up to Flood Zone 3; land with a high risk of flooding) as shown by an area of Flood Zone 2 and Flood Zone 3 (***Figure 20.3.1*** (APP-496)). There are no formal fluvial flood defences along the Hundred River.

## 2.4 Ecological Baseline

### 2.4.1 Habitats

26. To the east of the Hundred River crossing lies an area of poor semi-improved grassland as recorded within the ***Extended Phase 1 Habitat Survey*** (APP-277). Within this area a group of mature *Quercus robur* (oak) were recorded. Surveys assessed these features as having moderate potential to support roosting bats and providing opportunities to support nesting birds.

27. To the west of the Hundred River crossing is a small area of open semi-natural broadleaved woodland separating the river from the B1122 Aldeburgh Road, which severs the link in this otherwise functionally linked habitat. The extent of open semi-natural broadleaved woodland continues west of the B1122 Aldeburgh Road. This woodland is characterised by open mosaic habitats with key ground flora species comprising of *Rubus spp.* (bramble), *Pteridium spp.* (bracken) and *Ulex spp.* (gorse). This mosaic habitat is noted as providing optimal habitat for hibernating reptiles. The key tree species recorded were oak, *Betula pendula* (silver birch), *Crataegus monogyna* (hawthorn), gorse, *Ilex spp.* (holly), *Salix repens* (creeping willow), *Laurus spp.* (laurel) and *Aesculus hippocastanum* (horse chestnut). These features (i.e. semi-natural broadleaved woodland and open mosaic habitat) are noted as providing moderate potential to support commuting / foraging bats.

28. Ecological surveys undertaken on 15th – 16th February 2021 verified the results of the ***Extended Phase 1 Habitat Survey*** (APP-277). Upper canopy species were recorded as scattered oak, cypress, beech, silver birch, hazel and sycamore throughout. Mature alder and willow were present along the edge of the Hundred River. There was a limited middle canopy present, with key species comprising primarily of hazel and blackthorn. Ground vegetation species included daffodil, snow drop, broad leaf dock, cleavers, nettle, teasel, ground ivy, bramble, ferns and a small patch of reed canary grass. Yorkshire fog, forget-me-not and

horsetail were also prevalent, with pin cushion moss and delicate fern moss being recorded.

29. As presented in ***Chapter 22*** of the ES (APP-070), the Hundred River has been assessed as providing suitable habitat for *Lutra lutra* (otter) and *Arvicola amphibius* (water vole). *Impatiens glandulifera* (Himalayan Balsam), an invasive non-native species, was recorded along the Hundred River outside the Order limits, approximately 123m upstream.

30. The area of the Hundred River crossing is approximately 1.4km (in river channel length) north of the Sandlings SPA and the overlapping Leiston – Aldeburgh SSSI. The Sandlings SPA is designated for breeding populations of nightjar and woodlark, acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. Leiston – Aldeburgh SSSI is afforded protection for acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle.

### 2.4.2 Notable and Protected Species

31. Whilst suitable habitat has been recorded for both otter and water vole, no evidence of these species using the Hundred River within the Order limits has been recorded during the ecology surveys completed to date.

32. As presented in ***Appendix 22.6*** of the ES (APP-507), the semi-natural broadleaved woodland located to the west of the Hundred River crossing was recorded as supporting foraging and commuting common and soprano pipistrelle, *noctule*, *Myotis spp.* and *barbastelle*, *serotine*/*leisler* bats.

33. The ecological surveys on 15th and 16th February 2021 assessed the habitat conditions at the Hundred River itself, as well as of the adjoining grazing land regarding hairy dragon fly. No emergent vegetation was identified and limited bankside vegetation (key species being bramble (*Rubus* spp.), nettle (*Urtica dioica*), teasel (*Dipsacus*) and perennial rye grass (*Lolium perenne*)) was recorded. Cattle were present on the grazing land and the key species noted comprised perennial rye grass and Yorkshire fog among open muddy areas. It is therefore concluded that hairy dragonfly is unlikely to be present due to the absence of its habitat requirements.

34. The final Watercourse Crossing Method Statement will include a description of the baseline conditions for fish and eel and will reflect the results of pre-construction surveys for these species.

### 2.4.3 Downstream Ecological Receptors

35. Downstream of the Hundred River crossing, the river flows for approximately 1.4km before crossing into the Sandlings SPA and Leiston-Aldeburgh Site of

Special Scientific Interest (SSSI). Consideration of the ecological baseline, a screening for Likely Significant Effects and an assessment for Adverse Effect on Integrity of the Sandlings SPA has been undertaken as part of the Habitats Regulations Assessment provided in ***Appendix 5***.

# 3 Construction Methodology

## 3.1 Overview

36. The Hundred River crossing will be constructed using a conventional open cut methodology. A number of factors will influence this crossing method, including depth of water, available space, duration of works, riverbed conditions, accessibility and potential for ingress of water. Commentary regarding the constraints of a trenchless technique at the Hundred River crossing has been provided within ***Appendix 2*** of this Outline Watercourse Crossing Method Statement.

37. It is anticipated that the ducting to accommodate the onshore cables will be buried a minimum of 1.2m below the bed of the riverbed and the associated banks / defences at the Hundred River crossing.

38. The detailed methodology for crossing the Hundred River and the temporary bridge arrangements required will be presented within the final Watercourse Crossing Method Statement. The profile of the trench crossing the river, the construction techniques and the mitigation measures to be adopted would be determined in consultation with the Environment Agency during preparation of the final Watercourse Crossing Method Statement. Determining engineering factors are the required cover underneath the riverbed, the river bank profiles and the minimum bend radii of the onshore cables and associated ducting.

39. The chosen method of crossing the Hundred River will be based upon the results of pre-construction surveys (see ***section 4.18***), the final construction programme (i.e. season within works will be undertaken) and design requirements established through post-consent engagement with contractors to establish the most efficient and acceptable means of water conveyance. In particular, subject to ground conditions, the design of the Hundred River crossing will seek to minimise the width of the onshore cable route as it passes the Hundred River in order to minimise the need to remove vegetation (including trees) along its western bank.

## 3.2 Dry Crossing Technique

40. The Applicant's preferred technique for crossing the Hundred River is a dry open cut trench technique, which would involve damming the watercourse upstream and downstream of the crossing to create a dry area where the onshore cables cross the Hundred River. Water will then be diverted from where it has been impounded upstream and discharged downstream of the crossing area, via flumes or pumps.

41. The proposed construction technique would be as follows:

- The proposed over-pumping method will be agreed with the Environment Agency prior to the works commencing and will be in accordance with approved Code of Construction Practice secured under Requirement 22 of the DCO.
- Within the onshore cable route (34m wide at this location for one project and 68m wide where the onshore cable ducts for both East Anglia TWO and East Anglia ONE North are installed in parallel (to allow for safe working areas for each respective project)), large sandbags will be placed within the watercourse either side of the proposed trench location to dam the watercourse. The sandbags would be positioned within the working width of the onshore cable route, starting with the dam upstream. Smaller sandbags will be placed in front to close any potential gaps. The top of both dams will be kept lower than bank-top to prevent overland flooding in the event of pump failure.
- The sandbags will remain in place throughout the duration of the works.
- The area of water between the dams will be inspected for fish and other aquatic life. If there are pools where fish/eels may have gathered, works will stand down and an appropriate fish rescue plan will be executed, which may include electro fishing if necessary. Should any aquatic life be discovered, it will be relocated to the other side of the downstream dam. A fish rescue plan, which will set out the methods to be implemented, will be included within the final Watercourse Crossing Method Statement. Implementation of this plan will be overseen by a suitably qualified ecologist, where required.
- The area will be pumped dry using suitable sized pumps placed on the side of the banks. The pump will be kept back at least 8m from river and will be a silent running type pump to minimise noise generation. Noise barriers will also be placed around the pump to further reduce any disturbance to local residents where required.
- The pump will remain running during the works to ensure no flooding occurs upstream of the works. A second pump on a float shall be installed, should the first pump fail it will automatically start to pump the water. During working hours, in the unlikely event of pump failure and flash flood the attendant will remove sandbags in the dam to allow water to flow freely and prevent flooding
- The pump size will be determined based on the flow rate of the river and shall be 110% bunded. Any external fuel lines shall also have drip trays placed underneath, with a capacity of 110%.
- Refuelling of the pump will take place using small fuel cans with additional plant ‘nappies’ placed around the fuel tank area for additional protection against spill contamination. The pump will also be placed at least 8m distance

from the river bank to avoid any accidental fuel contamination in the river. A spill kit of suitable capacity shall be stored with the pump at all times.

- The pump inlet will be constructed inside a sump (vertical pipe with stone surround) that prevents fauna and riverbed material entering the pump. The outlet shall be placed onto a hard surface to prevent scouring. If this is not possible, the outlet will be regularly moved to reduce scouring.
- The dam will only be installed after the weather forecast and flood risk has been assessed so works are carried out during dryer weather when the water flow within the watercourse is low with no risk of flooding upstream. The contractor will register with the Environment Agency flood alert notification service. A depth marker will also be installed upstream, notifying the working party should the river level raise a predetermined acceptable level.

42. Following the pumping out of the works area, the trench would be excavated according to the following process:

- The duct route will be marked out over the crossing point.
- Topsoil will be stripped from areas adjacent to the water banks down to bed level using a 360° tracked excavator or similar, with the material stored at least 8m away from the river bank for reuse. Any aquatic vegetation shall be stored on the river banks for 24 hours after removal to allow any trapped invertebrates to moved back into the river.
- Spoil and watercourse bed material will be excavated and stockpiled separately, at least 8m from the river bank for reuse.
- The sides of the excavations will be battered and stepped back to prevent side wall collapse. Alternatively trench boxes or shuttering will be used to support the sides of the excavation.
- Ground water within the trench will be pumped out using submersible pumps placed in a sump within the excavation and discharged to ground. The requirement for treatment and/or permitting shall be considered during the planning for the works.
- The ground water from the trench will be released back to ground at least 50m from the excavation to slow re-ingress.
- Silt socks will be utilised where suitable. Other treatment options will be explored if necessary, depending on ground conditions established pre-construction.
- Once the trench is at the correct depth cement bound sand or sand will be placed into the trench and lightly compacted. Ducts will be laid to a minimum depth of 1.2m below the hard bed of the watercourse and extend 3m from the

brink of the river before rising to connect to the standard depth of the onshore cable route.

- Due to the cable depth requirements when passing beneath watercourses, a concrete backfill will be placed around and on top of the ducts.
- Excavated material including the riverbed will be replaced into the trench using an excavator (or similar) and compacted.
- Where used, trench boxes or shutters will be slowly removed, and the remaining back fill placed to the correct levels.
- On reinstatement of the riverbed and bank, the downstream dam shall be removed before the upstream dam, reducing the amount of silt mobilised downstream.

43. Further detail on the method of impoundment and diversion will be decided at the detailed design stage and set out within the final Watercourse Crossing Method Statement.

## 3.3 Flume Pipe Crossing Technique

44. In the flume pipe crossing technique, a flume pipe is installed on the river bed along the corresponding length of the works, allowing the river water to flow through the pipe (and maintain river flow) whilst the onshore cable route is constructed under the flume pipe by equipment operating from either (or both) banks. After excavation of the trench, a section of ducting is placed into the trench.

45. The construction methodology relating to the flume pipe crossing technique would be as follows:

- Flume pipes would be suitably sized to allow uninterrupted flow of water within the watercourse once installed. The flume would be located within the onshore cable route (34m wide at this location for one project and 68m wide where the onshore cable ducts for both East Anglia TWO and East Anglia ONE North are installed in parallel). Sandbags will close any gaps between the watercourse and the flume pipe.
- Topsoil will be stripped from areas adjacent to the water banks down to bed level using a 360° tracked excavator (or similar). Spoil and watercourse bed material will be excavated and stockpiled separately for reuse. All excavated material will be stored at least 8m away from the river bank.
- The sides of the excavations will be battered and stepped back to prevent side wall collapse. Alternatively, a proprietary trench shield will be utilised to allow excavations to be excavated. The trench shield shall be assembled at

ground level at a safe distance from the excavation and then lifted into position.

- Once the trench is at the correct depth, ducts will be installed in accordance with drawing and manufactures instructions.
- Concrete backfill will be placed around and on top of the ducts to the correct level as indicated on the drawings.
- Excavated material including the riverbed will be replaced into the trench using an excavator and compacted.
- The river banks will be reformed to their original profile with the excavated material.
- The flume pipe, any environmental protection measures or surplus material will be removed from site.

## 3.4 Construction Consolidation Site

46. The crossing of the Hundred River will be facilitated by a Construction Consolidation Site (CCS) immediately south of Thorpeness Road (Work No. 18) and/or or the CCS located to the west of Aldeburgh Road (Work No. 22). Each CCS would be up to 3,000m$^2$ in area (approximate dimensions of 60m x 50m) and will also serve other areas of the onshore cable route.

## 3.5 Access

47. Accesses to the Hundred River are shown within the ***Access to Works Plan*** (APP-012) and will be primarily obtained via Sizewell Gap or Snape Road using the Projects' temporary haul roads. Where the Projects' temporary haul road(s) are not available, access to the Hundred River will be gained via Aldeburgh Road using temporary traffic signals where required (with HGV access limited to 7 two-way HGVs during construction of a single project, or up to 10 two-way HGV movements where the onshore cable ducts for both East Anglia TWO and East Anglia ONE North are installed in parallel). Use of temporary traffic signals where required reduces the extent of any 'bell mouth' to be constructed at the access point, thereby reducing vegetation clearance required to accommodate the works.

## 3.6 Duration of Construction Works

48. Construction works to lay onshore cable ducts associated with the Hundred River crossing (for East Anglia TWO and East Anglia ONE North in parallel) and associated reinstatement works (excluding any seasonally dependant planting) are anticipated to be completed within two months.

49. Subsequent pulling of onshore cables through the ducts will be undertaken at a later date. Whilst ducting for both East Anglia TWO and East Anglia ONE North will be installed in parallel, should these projects be constructed sequentially overall it is envisaged that when the second project moves into the construction phase, the only construction works required at the Hundred River crossing will be the undertaking of duct integrity testing, duct dewatering, duct cleaning (if required) and the pulling of electrical cables through the pre-installed cable ducts, albeit such works are undertaken from outside the immediate vicinity of the Hundred River unless repair is required. Other works such as construction of joint bays for the jointing of onshore cables will be undertaken beyond the immediate area of the Hundred River crossing.

# 4 Mitigation Measures

## 4.1 Timing of Works

50. For both dry and flume pipe crossing techniques, timing of the works is important. Periods of low flow would be chosen to undertake the crossing works wherever practicable.

## 4.2 Erosion Control

51. Erosion control measures (e.g. coir matting) would be installed and maintained until the work area has stabilised and vegetation became sufficiently re-established to prevent erosion of the bank.

52. Where there is a risk of sediment run-off, sediment interception techniques would be used.

## 4.3 Water Quality

53. Whichever crossing methodology set out within ***section 3*** is employed for the Hundred River crossing, careful consideration will be given to how the water is returned to the river channel downstream of the works to minimise and / or avoid scour of the riverbed and mobilising sediment where possible.

54. The Applicant will review the WFD status objectives for the Hundred River prior to preparing the final Watercourse Crossing Method Statement and determine a requirement for additional measures to be included within the final method statement to ensure potential impacts upon the water quality of the Hundred River are minimised. Appropriate measures to ensure no deterioration in WFD status of the watercourse will be included within the final Watercourse Crossing Method Statement.

55. During construction of the Hundred River crossing, monitoring of the water quality of the river will be undertaken. A programme of monitoring will be set out within the final Watercourse Crossing Method Statement.

56. Measures to prevent the release of contaminants into the watercourse are set out within section 5 and section 6 of the ***Outline Code of Construction Practice*** (an updated version has been submitted at Deadline 6, document reference 8.1).

## 4.4 Material Storage

57. No materials will be stored within Flood Zone 2 or Flood Zone 3 along the length of the onshore cable route.

58. Where possible, spoil (i.e. trench arisings) will be stored outside of the Hundred River crossing or beyond the extent of Flood Zone 2 and Flood Zone 3 (whichever is the furthest extent from the river bank). This will minimise the risk of silt-runoff into the river channel and displacement of water in the event of a flood. Topsoil and subsoil will have separate storage areas and will not be allowed to be mixed with one another or any other unsuitable materials.

## 4.5 Hydrogeological Risk

59. The Applicant will undertake a visual inspection of water features prior to construction to identify any requirement for further measures and inform the final Watercourse Crossing Method Statement. It is anticipated that a hydrogeological risk assessment will be undertaken at the Hundred River crossing prior to the commencement of works to provide information on the geological conditions and inform the detailed design of the onshore cable at the Hundred River crossing.

60. Prior to construction, the Applicants will evaluate the local hydrogeology with reference to the degree of hydraulic connectivity between the Hundred River and its associated aquifers within the vicinity of the Hundred River crossing. Should potential impacts upon the aquifer, arising from the depth of excavations associated with the Hundred River crossing, be identified during this evaluation, appropriate mitigation measures will be identified and included within the final Watercourse Crossing Method Statement.

## 4.6 Flow Control

61. Any over-pumping at the Hundred River crossing would be a non-consumptive operation (i.e. no transmission loss). The objectives of over-pumping are to:

- Ensure that the flow rate downstream of the Hundred River crossing is the same as the flow rate upstream during typical meteorological conditions; and
- Ensure that there is sufficient capacity within the channel and the floodplain to maintain flows during a flood event.

62. The chosen method for maintaining the conveyance of flow downstream of the Hundred River crossing will be detailed within the final Watercourse Crossing Method Statement. The final design and details of the flow control measures will be approved by the Environment Agency via the relevant permitting process (see ***section 4.8***). Where a pumped method of water conveyance is used, the final Watercourse Crossing Method Statement will provide measures to ensure any mechanical failure of pumping equipment is minimised as far as practicable and controls are in place should this occur (i.e. back-up or standby pumps will be available on site for prompt deployment).

During construction of the Hundred River crossing, monitoring of the flow rate upstream and downstream of the crossing site will be undertaken. A programme of monitoring will be set out within the final Watercourse Crossing Method Statement.

## 4.7 Vehicle Crossing of the Hundred River

63. No vehicle crossing of the Hundred River is required, although a temporary bailey bridge (or similar) may be installed to facilitate use by the workforce on foot.

## 4.8 Onshore Cable Route Width

64. Since submission of the Application, the Applicant has reduced the working width of the onshore cable route where the cables cross the Hundred River from 50m to 34m per project. This working width applies for a distance of 40m from the Hundred River's western bank and eastern bank (the Hundred River crossing buffer). The Order limits remain unchanged. Subject to ground conditions, the design of the Hundred River crossing will seek to minimise the width of the onshore cable route as it passes the Hundred River in order to minimise the need to remove vegetation (including trees) within this area.

65. The width of the onshore cable route between the Hundred River crossing buffer and Aldeburgh Road will be reduced to 16.1m where a single project is constructed, or 27.1m where the onshore cables/ducts for East Anglia TWO and East Anglia ONE North are installed in parallel. This reduction will minimise the need for vegetation and tree removal and minimise disturbance in the area. The width of the onshore cable route within the Hundred River crossing buffer will be up to 34m wide for a single project or 68m where the onshore cables/ducts for East Anglia TWO and East Anglia ONE North are installed in parallel.

## 4.9 Tree Protection

66. ~~Within the onshore cable route, trees~~Trees along the western bank of the Hundred River (extending 5m inland) which fall outside the area in which the onshore cables are to be installed but within the 34m (single project) or 68m (both Projects) working area will not be removed unless for safety reasons, thereby minimising the area of disturbance as a result of the Project.

## 4.10 Permits and Licencing

### 4.10.1 Permits

67. The methodology to be used for any temporary or permanent works associated with the Hundred River crossing will be agreed with the Environment Agency in accordance with the Environmental Permitting (England and Wales) Regulations 2016 and Water Resources (Abstraction and Impounding) Regulations 2006. In line with these regulations, the Applicant will apply for a Flood Risk Activity Permit

prior to commencement of the works associated with the Hundred River crossing. It is anticipated a water resources licence will be required in relation to impounding the Hundred River. Where dewatering or abstraction activities that meet the thresholds for requiring a water resources licence are identified, an application will be submitted to the Environment Agency prior to commencement of the works associated with the Hundred River crossing.

68. The exact Hundred River crossing method and construction programme will be finalised post-consent, at which point the permitting requirements (or otherwise) will be established.

69. A permit may be required for the installation of a temporary bailey bridge (or similar) to provide access on foot across the river. The Applicant will submit an application for the appropriate permit prior to commencement of works associated with the Hundred River crossing.

70. In accordance with the Land Drainage Act 1991 and local byelaws, the Applicant will seek written consent from the East Suffolk Internal Drainage Board (IDB) on the final methodology to be used for any temporary works associated with Ordinary watercourse crossings within the East Suffolk Internal Drainage District.

71. Written consent from the Lead Local Flood Authority (Suffolk County Council) will be obtained for the final methodology to be used for any temporary works associated with Ordinary watercourse crossings outside of the East Suffolk Internal Drainage District (pursuant the Land Drainage Act 1991).

### 4.10.2 Abstraction Licences

72. Relevant abstraction licence holder(s) will be consulted by the Applicant about any works at the Hundred River crossing which have the potential to disrupt flow. Measures will be put in place to minimise impacts upon the supply of water to the abstraction licence holder. Such measures will be presented within the final Watercourse Crossing Method Statement.

73. Should a requirement for abstracting water from the Hundred River or from ground for use in construction be identified, the Applicant will submit an application for an Environmental Permit for abstraction from the Environment Agency.

### 4.10.3 Ordinary Watercourse Consent at the Onshore Substation Location

74. Under the Land Drainage Act 1991, any works (either temporary or permanent) which will alter the flow of water along a watercourse or require the erection of a culvert, bridge or modification to the channel will require consent from the

corresponding relevant authorities such as the Environment Agency or Lead Local Flood Authority (LLFA).

75. Land drainage consent associated with temporary and permanent works at the East Anglia TWO, East Anglia ONE North and National Grid onshore substations would be applied for separately to land drainage consent for temporary construction works along the onshore cable route. An application for land drainage consent in respect of the onshore substations and National Grid infrastructure works will be submitted to the LLFA post-consent and will include details of the measures to be implemented in relation to any affected Ordinary Watercourses.

## 4.11 Compensation Discharge

76. Essex & Suffolk Water, at the request of the Environment Agency, is required to make a compensation discharge of 0.205 Ml/d (25 Ml/annum) between July and October inclusive from the Essex & Suffolk Water Coldfair Green boreholes to the Hundred River.

77. Prior to the commencement of works associated with the Hundred River crossing, the Applicant will provide evidence to the Environment Agency regarding how the measures will be sufficient to maintain the conveyance of the compensation discharge.

78. The final Watercourse Crossing Method Statement will include information on surface water flow rates and discharge rates during construction works to ensure the compensation discharge currently operated by Essex & Suffolk Water at the Hundred River can be maintained.

## 4.12 Working Hours

79. Construction activities would normally be conducted Monday to Friday between 0700 hours and 1900 hours and on Saturday between 0700 hours and 1300 hours, with no construction on Sundays or Bank Holidays, in line with Requirement 23 of the ***draft DCO*** (REP5-003). Unlike a trenchless technique, an open trench technique will not require 24-hour working (and therefore will not require lighting or construction personnel to be present 24-hours per day).

## 4.13 Waste Management

80. Where waste cannot be treated and discharged on site under a Regulatory Position Statement or permit issued by the Environment Agency, it will be removed from the works and disposed of in accordance with the approved site waste management plan (secured by Requirement 22 of the ***draft DCO*** (~~REP5-003~~AS-109)).

## 4.14 Fencing

81. A temporary heras type fencing or wooden hoarding or similar may be erected to demark the onshore cable route, in line with the details approved under Requirement 17 of the ***draft DCO*** (~~REP5-003~~AS-109). Appropriate signage and notices will also be fixed along the boundary of the works to inform members of the public as to the works being undertaken.

## 4.15 Reinstatement

82. Following installation of the ducts, subsoil and topsoil will be reinstated to the original levels and profile. The riverbanks will then be replanted or allowed to naturally regenerate to a specification set out in the final Watercourse Crossing Method Statement.

83. The riverbed, the river banks and any existing defences associated with the river at the Hundred River crossing will be reinstated to their pre-construction condition and restored to the original level, to minimise potential impacts of flooding and in-channel and riparian habitats.

84. Areas of woodland removed between the Hundred River and Aldeburgh Road will be replaced in areas which does not interfere with the operation of the onshore cables, and otherwise with shallow rooting shrub mix, species rich grassland and hedgerows.

85. The final Watercourse Crossing Method Statement (which requires approval from the relevant planning authority) will include a detailed specification of the reinstatement to be undertaken.

86. Any temporary fencing, plant and machinery associated with the Hundred River crossing will also be removed.

87. Areas of replacement tree planting will be subject to a ten year adaptive management programme as described in the ***Outline Landscape and Ecological Management Strategy*** (OLEMS) (~~updated version submitted at Deadline 6,~~ document reference 8.7). On completion of reinstatement to the specification set out within the final Watercourse Crossing Method Statement, it is anticipated there will be no further requirement for ongoing monitoring regarding water quality and flow.

## 4.16 Jointing Bays

88. Jointing bays (for the jointing lengths of the onshore cables) will be located outside of the Hundred River crossing or beyond the extent of Flood Zone 2 (whichever is the furthest extent from the river channel) where possible, thereby

avoiding the need for further excavations in these areas during the onshore cable installation works.

## 4.17 Lighting

89. No 24-hour lighting is anticipated to be required for the works associated with Hundred River crossing, although time limited task lighting may be utilised in localised areas where required.

## 4.18 Pre-construction Surveys

90. Pre-construction surveys for eel, fish, otter and water vole will be undertaken in accordance with relevant industry guidance. The extent of the survey area for eel, fish and water vole will comprise the Hundred River crossing plus 100m upstream and downstream of the crossing location. For otter, the extent of the survey area will extend 500m from the Order limits at the Hundred River crossing along the course of the river.

91. The pre-construction survey results will be used to inform species-specific ecological mitigation measures (including any licence requirements), which will be included within the final Ecological Management Plan prepared post-consent to discharge Requirement 21 of the ***draft DCO*** (~~REP5-003~~AS-109). Copies of all pre-construction survey reports will be appended to the final Ecological Management Plan. Results of these surveys will also inform the mitigation measures (if required) included within the final Watercourse Crossing Method Statement.

92. Where migrating eel and / or fish species are recorded, provision will be made for the upstream / downstream migration of eels or fish (e.g. fish pass) using the Hundred River across the site of the crossing.

93. Where breeding bird checks are required for the works associated with the Hundred River crossing, these will be undertaken in accordance with the final Breeding Bird Protection Plan (BBPP). The implementation of the BBPP will be the responsibility of the Ecological Clerk of Works (ECoW).

## 4.19 Species Specific Mitigation

94. The requirement for species-specific mitigation will be informed by the results of the pre-construction surveys. The specific pre-construction surveys that will be undertaken are set out within the ***Outline Landscape and Ecological Management Strategy*** (OLEMS~~).~~) (document reference 8.7). They will include pre-construction bat roost and activity surveys to provide an updated assessment of the commuting and/or roosting value of any features identified for removal within the onshore development area.

95. The Applicant will identify the baseline conditions for eel and coarse fish species using the Hundred River prior to commencement of construction of the Hundred River crossing. A baseline for each of the relevant ecological receptors will be included within the final Ecological Management Plan prepared in accordance with Requirement 21 of the ***draft DCO*** (~~REP5-003~~AS-109).

96. An invasive species method statement which will include measures to manage the risk of works to prevent the spread of invasive non-native species to other areas along the Hundred River and / or other watercourses will be prepared in accordance with Requirement 21 of the ***draft DCO*** (~~REP5-003~~AS-109). The invasive species method statement will include procedures for minimising the risk of spreading Himalayan Balsam (as this is the only invasive non-native species recorded within the vicinity of the Order limits (but outside the Order limits) to date). The invasive species method statement will form part of the final Ecological Management Plan approved by the relevant planning authority.

## 4.20 Watercourse Crossing Habitat Reinstatement and Management

97. The construction footprint of the Hundred River crossing will be reinstated as soon as practicable following completion of the crossing works.

98. Depending on the findings of the pre-construction surveys and / or licence conditions associated with the Hundred River crossing, there may be a requirement for species-specific monitoring. Details (e.g. programme) of any monitoring required will be included within the final Watercourse Crossing Method Statement. Details of ecological monitoring outside of the Hundred River crossing will be set out separately within the final Ecological Management Plan.

## 4.21 Contact Details

99. Contact details for the relevant planning authority, the relevant statutory nature conservation body and the Environment Agency will be provided within the final Watercourse Crossing Method Statement for ease of reference.

# 5 Next Steps

101. The final Watercourse Crossing Method Statement will be prepared post-consent in accordance with this Outline Watercourse Crossing Method Statement in line with Requirement 22 of the ***draft DCO*** (~~REP5-003~~AS-109). The Applicant will consult with the relevant planning authority, Natural England and the Environment Agency during the preparation of the final Watercourse Crossing Method Statement to ensure appropriate mitigation measures are incorporated within the works.

102. The LLFA and East Suffolk IDB will also be consulted during the preparation of the final Watercourse Crossing Method Statement regarding any matters relating to Ordinary watercourses.

103. The Environment Agency will, in addition, be consulted specifically regarding any information contained within the final Watercourse Crossing Method Statement relating to ground water abstraction and compensation discharge.

104. The final Watercourse Crossing Method Statement will provide further detail on the crossing of the Hundred River, other watercourses and detail the mitigation measures (informed by pre-construction surveys and a full understanding of the construction works to be undertaken and its potential effects) to be adopted.

# Appendix 1: Figures

N

Sandlings (SPA)

Leiston - Aldeburgh (SSSI)

## Legend

- East Anglia ONE North and East Anglia TWO Onshore Development Area
- National Grid Substation
- Western Substation
- Eastern Substation
- Hundred River
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

SCOTTISHPOWER RENEWABLES

| Rev | Date | By | Comment | | |
|---|---|---|---|---|---|
| 3 | 07/06/2021 | AB | Third Issue. | | |
| 2 | 22/02/2021 | AB | Second Issue. | Prepared: | AB |
| 1 | 09/02/2021 | AB | First Issue. | Checked: | CS |
| | | | | Approved: | BD |

1:25,000 Scale @ A3

0 0.5 1 Km



# East Anglia ONE North and East Anglia TWO

Hundred River and Statutory Designated Sites Location

| | | |
|---|---|---|
| Drg No | EA1N-EA2-DEV-DRG-IBR-001273 | Coordinate System: BNG Datum: OSGB36 |
| Rev | 3 | |
| Date | 07/06/21 | |
| Figure | 1 | |

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N

Pp Ho

The Old School

W

Path

FB

Drain

Track

School Plantation

Aldringham Court Nursing Home

Path

Drain

Path

Tk

Gipsy Lane

Drain

Tk

9m

Drain

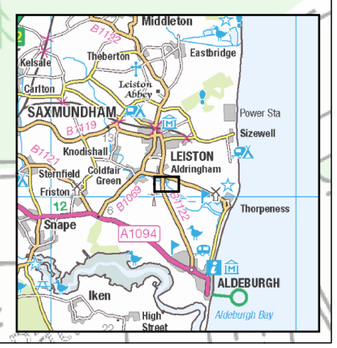
Path

Hazelwood

Churc Walk

## Legend

- East Anglia ONE North and East Anglia TWO Onshore Development Area
- Hundred River
- Hundred River Crossing Buffer
- Work No 19




SCOTTISHPOWER RENEWABLES

| Rev | Date | By | Comment | | |
|---|---|---|---|---|---|
| 2 | 22/02/2021 | AB | Second Issue. | Prepared: | AB |
| 1 | 09/02/2021 | AB | First Issue. | Checked: | CS |
| | | | | Approved: | BD |

1:2,500 Scale @ A3

0 50 100 Metres



# East Anglia ONE North and East Anglia TWO

Hundred River Crossing Location

| | |
|---|---|
| Drg No | EA1N-EA2-DEV-DRG-IBR-001274 |
| Rev | 2 |
| Date | 22/02/21 |
| Figure | 2 |

Coordinate System: BNG Datum: OSGB36

D:\Box Sync\PB4842 EA 1N and 2\PB4842 EA 1N and 2 Team\E. TECHNICAL DATA\E03 GIS\EA1N_EA2_Examination\Figures\Outline_Watercourse_Crossing_Method_Statement\HRA\EA1N_EA2_Fig2_HundredRiverCrossing_RH_20210209.mxd

# Appendix 2: Commentary on the Unsuitability of a Trenchless Technique

1. At the time of preparing the Project's Environmental Statement, consideration was given to the available methods for crossing the Hundred River. There are a combination of constraints and technical considerations at this location including:

   - The Hundred River itself;
   - The B1122 Aldeburgh Road;
   - Fitches Lane;
   - Residential properties;
   - The wooded area to the west of B1122 Aldeburgh Road);
   - The requirement to install six power cables (each spaced sufficiently apart to ensure thermal independence from each other), up to two fibre optic cables and up to two distributed temperature sensing cables for each Project within the crossing;
   - The unknown geological conditions in the area (and the need for a trenchless technique to be undertaken in appropriate ground strata to ensure the integrity of the crossing); and
   - Technical constraints in the depth that the onshore cables can be laid, noting that deeper cabling will require larger cables to compensate for thermal build-up in the cables.

2. The Applicant considers there to be insufficient lateral space and insufficient confidence in trenchless techniques at this location in order to include it as a viable means of crossing these obstacles. In all cases, a trenchless crossing technique would require specific plant and equipment deliveries and operation; additional work compounds and infrastructure; additional water supplies; additional waste generation and disposal; potentially caisson installation (depending on technique); and a considerably longer construction duration.

3. With specific reference to a micro-tunnelling technique, the Applicants consider a micro-tunnel operation to be unfeasible due to the disturbance it would impose to the area such as:

   - The delivery of the plant, machinery and piping required for this operation as well as the handling and disposal of the material used and removed

from the tunnelling operation would involve considerably higher levels of traffic than for an open trench solution;

- It would require the construction and installation of two deep/large caissons/pits (at entry/exit points) for the machine drilling head to be installed/removed;
- It would require the set-up of a large compound at the entry point to cover all aspects of the works including but not limited to set-up of control rooms/offices, laydown area, water, soil and waste management plant areas, among others; and
- The construction programme (including reinstatement of the affected areas) for this technique will extend significantly from that of the open trench crossing technique.

4. Sufficient space and confidence exists to accommodate a dry open trench crossing of the Hundred River and adjacent obstacles, allowing a clear plan for the works (including diversion / over pumping of the Hundred River and environmental mitigation measures) to be clearly set out within the final Watercourse Crossing Method Statement (which must be approved by the relevant planning authority prior to commencement of the relevant stage of the onshore works in accordance with Requirement 22 of the ***draft DCO*** (REP5-003)).

# Appendix 3: Sandlings SPA & Leiston – Aldeburgh SSSI Citations

# EC Directive 79/409 on the Conservation of Wild Birds

# Citation for Special Protection Area (SPA)

**Name:** Sandlings

**Unitary Authority/County:** Suffolk

**Consultation proposal:** All or parts of Blaxhall Heath Site of Special Scientific Interest (SSSI), Leiston - Aldeburgh SSSI, Sandlings Forest SSSI, Snape Warren SSSI, Sutton & Hollesley Heaths SSSI and Tunstall Common SSSI have been recommended as a Special Protection Area because of their European ornithological importance. In particular, for their breeding populations of Nightjars *Caprimulgus europaeus* and Woodlarks *Lullula arborea*.

**Site description:** The Sandlings SPA lies near the Suffolk Coast between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath being subject to successional changes, with the consequent spread of bracken, shrubs and trees, although recent conservation management work is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities, with dependant invertebrate and bird communities of conservation value. Woodlark *Lullula arborea* and Nightjar *Caprimulgus europaeus* have also adapted to breeding in the large conifer forest blocks, using areas that have recently been felled and recent plantation, as well as areas managed as open ground.

**Size of SPA:** The SPA covers an area of 3,391.80 ha.

**Qualifying species:**
The site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

| Annex 1 species | Count and Season | Period | % of GB population |
|---|---|---|---|
| Nightjar *Caprimulgus europaeus* | 109 males - breeding | Count as a 1992 | 3.2% GB |
| Woodlark *Lullula arborea* | 154 pairs - breeding | Count as at 1997 | 10.3% GB |

Bird figures from:

Morris, A., Burges, D., Fuller, R.J., Evans, A.D. & Smith, K.W. 1994. The status and distribution of nightjars *Caprimulgus europaeus* in Britain in 1992. A report to the British Trust for Ornithology. *Bird Study* **41**: 181-191.

Wotton, S.R. & Gillings, S. 2000. The status of breeding woodlarks in Britain in 1997. *Bird Study* **47**: 212-224.

**Status of SPA**
Sandlings was classified as a Special Protection Area on 10 August 2001.

COUNTY: SUFFOLK SITE NAME: LEISTON-ALDEBURGH

DISTRICT: SUFFOLK COASTAL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authorities: SUFFOLK COASTAL DISTRICT COUNCIL, Suffolk County Council

National Grid Reference: TM 461595 Area: 534.34 (ha.) 1,319.82 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NE, TM 46 SE

Date Notified (Under 1949 Act): 1955 Date of Last Revision: –

Date Notified (Under 1981 Act): 1986 Date of Last Revision: 1999

Other Information:
Part RSPB and Suffolk Wildlife Trust reserves.
The site was named 'North Warren and Thorpeness Mere', before the 1999 boundary revision.

Description and Reasons for Notification:
Leiston-Aldeburgh contains a rich mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. This mix of habitats in close juxtaposition and the associated transition communities between habitats is unusual in the Suffolk Coast and Heaths. The variety of habitats support a diverse and abundant community of breeding and overwintering birds, a high number of dragonfly species and many scarce plants.

The heathland of North Warren, Aldringham Common, The Walks and Thorpeness Common is a fragment of the once extensive Sandlings heaths of coastal Suffolk and is of varying composition. There are patches of sand sedge *Carex arenaria* and heather *Calluna vulgaris* dispersed within acid grassland. Bracken *Pteridium aquilinum* and scrub, notably gorse *Ulex europaeus* and *U. gallii* also form part of the heathland. The short sward acidic grassland is dominated by sheep's-fescue *Festuca ovina* and common bent *Agrostis capillaris* with some bare patches, bryophytes and lichens. There is a varied associated flora including lady's bedstraw *Galium verum*, sheep's sorrel *Rumex acetosella* and the nationally scare mossy stonecrop *Crassula tillea* and clustered clover *Trifolium glomeratum*.

On the vegetated shingle there is a gradual transition between the strandline community and the shingle heath resulting from increasing stability and distance from tidal influence. On the open shingle, sea-kale *Crambe maritima* and yellow horned-poppy *Glaucium flavum* are frequent with the irregularly occurring sea spurge *Euphorbia paralias.* The stable shingle areas support many species including early hair-grass *Aira praecox*, the nationally scarce sand catchfly *Silene conica*, dune fescue

*Vulpia fasciculata*, bur medick *Medicago minima*, suffocated clover *Trifolium suffocatum* and sea pea *Lathyrus japonicus*.

Thorpeness Mere is a shallow, eutrophic water body on a peat substrate. The adjacent areas of swamp and carr woodland are hydrologically dependant on the mere. To the south of the mere, grey willow *Salix cinerea* woodland surrounds a fragmentary mosaic of fen communities, mostly reed dominant *Phragmites australis* with nettle *Urtica dioica*, hemp-agrimony *Eupatorium cannabinum* and wild parsnip *Pastinaca sativa*. In the fen meadow areas there is a richer suite of species including a large colony of adder's tongue *Ophioglossum vulgatum*.

Church Farm Marshes south of the mere consists of grassland that is mostly a mix of creeping bent *Agrostis stolonifera*, Yorkshire-fog *Holcus lanatus* and perennial rye-grass *Lolium perenne* with frequent crested dog's-tail *Cynosurus cristatus*. It is dissected by ditches dominated by spiked water-milfoil *Myriophyllum spicatum* and fennel pondweed *Potamogeton pectinatus* with water-crowfoot *Ranunculus baudotii* in the shallow margins.

The Fens area is dominated by common reed *Phragmites australis* with occasional lesser bulrush *Typha angustifolia*, yellow iris *Iris pseudacorus*, great willowherb *Epilobium hirsutum*, purple-loosestrife *Lythrum salicaria* and nationally scarce marsh sow-thistle *Sonchus palustris*. Water mint *Mentha aquatica* is present in the understorey with cleavers *Galium aparine* and bittersweet *Solanum dulcamara* frequent in the drier areas. Surrounding, and in many places merging into the fen, is grey willow *Salix cinerea* woodland and alder *Alnus glutinosa* woodland with a field layer containing a mix of remnant swamp species.

Many species of bird regularly breed using the great mix of habitats available. These include nightjar, woodlark and skylark on the dry grassland and heath. The scrub and woodland supports tree pipit, turtle dove, bullfinch and nightingale. The marshes, the open water and their margins, in particular, support a diverse range of breeding birds, including water rail, marsh harrier, gadwall and grasshopper warbler. The site is also attractive to wintering waterfowl including Bewick's swan and bittern and regularly supports important populations of white-fronted goose, gadwall and teal.

The variety of water bodies and terrestrial habitats provides suitable breeding and hunting areas for many species of dragonfly and damselfly, including the nationally scarce hairy dragonfly *Brachytron pratense.*

# Appendix 4: Sandlings SPA Conservation Objectives

# European Site Conservation Objectives for Sandlings Special Protection Area Site Code: UK9020286

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

**Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;**

- **The extent and distribution of the habitats of the qualifying features**
- **The structure and function of the habitats of the qualifying features**
- **The supporting processes on which the habitats of the qualifying features rely**
- **The population of each of the qualifying features, and,**
- **The distribution of the qualifying features within the site.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

**Qualifying Features:**

A224 *Caprimulgus europaeus*; European nightjar (Breeding)

A246 *Lullula arborea*; Woodlark (Breeding)

## Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitats Regulations'). They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives, and the accompanying Supplementary Advice (where this is available), will also provide a framework to inform the management of the European Site and the prevention of deterioration of habitats and significant disturbance of its qualifying features

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA).

Where these objectives are being met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

**Publication date:** 21 February 2019 (version 3). This document updates and replaces an earlier version dated 30 June 2014 to reflect the consolidation of the Habitats Regulations in 2017.

# Appendix 5: Habitats Regulations Assessment

# East Anglia ONE North and East Anglia TWO Offshore Windfarms

## Outline Watercourse Crossing Method Statement

### Appendix 5 Habitats Regulations Assessment

Applicant: East Anglia ONE North Limited and East Anglia TWO Limited
Document Reference: ExA.AS-~~5.D6.V2~~29.D11.V4_05
SPR Reference: EA2-DWF-ENV-REP-IBR-001044_05

Date: ~~24th February~~7th June 2021
Revision: Version ~~01~~04
Author: Royal HaskoningDHV

**Applicable to East Anglia ONE North and East Anglia TWO**

| Revision Summary | | | | |
|---|---|---|---|---|
| **Rev** | **Date** | **Prepared by** | **Checked by** | **Approved by** |
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# Table of Contents

# Glossary of Acronyms

| | |
|---|---|
| AEoI | Adverse Effect on Integrity |
| DCO | Development Consent Order |
| ES | Environmental Statement |
| HRA | Habitats Regulations Assessment |
| JNCC | Joint Nature Conservation Committee |
| LSE | Likely Significant Effects |
| RSPB | Royal Society for the Protection of Birds |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |

# Glossary of Terminology

| | |
|---|---|
| Applicant | East Anglia TWO Limited |
| East Anglia TWO project | The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure. |
| Hundred River crossing | Any works taking place within 8m of the Hundred River channel and its banks |
| Onshore cables | The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables. |

# 1 Introduction

1. This document has been prepared by East Anglia TWO Limited and East Anglia ONE North Limited (the Applicants) to provide further information of the East Anglia TWO and East Anglia ONE North Development Consent Order (DCO) applications (the Applications).

2. This Habitat Regulations Assessment (HRA) forms part of a set of documents that support the Application submitted by the Applicants. It accompanies the ***Outline Watercourse Crossing Method Statement*** (~~an updated version has been submitted at Deadline 6,~~ document reference ExA.AS-~~5.D6.V2~~29.D11.V4) to provide a screening for Likely Significant Effects (LSEs) and an assessment for Adverse Effect on Integrity (AEoI) of the Sandlings Special Protected Area (SPA) arising from the works associated with the Hundred River crossing.

3. The area of the Hundred River crossing is approximately 1.4km (in river length) north of the Sandlings SPA. Whilst the footprint of the Hundred River crossing is not located within the Sandlings SPA boundary and therefore will not result in direct impacts on its interest features, Natural England has requested that the potential indirect impacts upon the SPA and its qualifying features are considered.

4. The assessments presented in this HRA are based upon the construction techniques proposed for the Hundred River crossing set out within the ***Outline Watercourse Crossing Method Statement*** (~~an updated version has been submitted at Deadline 6,~~ document reference ExA.AS-~~5.D6.V2~~29.D11.V4).

# 2 Hundred River

5. The Hundred River, which has a catchment area of approximately 26km$^2$ rises near East Green, from where it flows south towards Knodishall and Coldfair Green. From here, it flows in a south-easterly direction towards the coast. The river flows to the south of The Meare at Thorpeness (to which it is connected via a sluice), from where it flows southwards along the landward edge of the coastal dune system until it discharges to the sea via a sluice to the south of The Haven.

6. The Hundred River is typical of a lowland, low energy drainage system that have been extensively modified in the past (potentially to facilitate drainage of surrounding wet floodplain habitats so that they can be used for agriculture).

7. The Hundred River has a naturally gently meandering planform, although there is considerable evidence of localised straightening. As a result of these modifications, the watercourse typically has a uniform trapezoidal channel with steep to near vertical banks. The banks are typically shallow, stable and well vegetated, although there is evidence of toe scour in parts of the catchment. Considerable areas of in-channel vegetation growth are also apparent. The channels are largely dominated by depositional processes, reflecting the low energy of the system, with natural silt beds and evidence of considerable fine sedimentation along the channel margins. Flows are typically low, and the upper reaches of the watercourse (upstream of the proposed cable crossing) were dry at the time of the walkover survey. Water levels are much deeper in the lower reaches of the river, which is likely to reflect the impounding and tide-locking influence of the sluice through which the river enters the sea.

8. Data presented on the Environment Agency's Catchment Data Explorer indicate that water quality in the Hundred River is relatively poor, with low concentrations of dissolved oxygen and elevated concentrations of phosphates (Environment Agency, 2016). High levels of phosphates are attributed by the Environment Agency (2016) to the input of treated wastewater effluent into the watercourse, while low levels of dissolved oxygen are attributed to naturally low flows. However, no other contaminants that are monitored under the Water Framework Directive (WFD) are noted in the data.

### 2.1.1 Relationship to Designated Sites

9. It is important to note that the Hundred River itself does not hold a statutory nature conservation designation. The location of the proposed crossing is east of the B1122 Aldeburgh Road, approximately 1.4km (in river length) before the Hundred River crosses the Sandlings SPA boundary. From this point, the lower reaches of the Hundred River, flow through the Sandlings SPA and also the Leiston –

Aldeburgh Site of Special Scientific Interest (SSSI) (***Figure 1***). The Sandlings SPA is designated due to the breeding populations of nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea.* The habitat requirements of these species include heath habitats, which are listed as part of the Leiston – Aldeburgh SSSI description (Joint Nature Conservation Committee (JNCC) 2016). Further detail on The Sandlings SPA and its qualifying features is provided in ***Section 3***.

10. The Leiston – Aldeburgh SSSI is designated for the acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle habitats that it supports (English Nature 1999). The mosaic of terrestrial habitats and water bodies provides suitable breeding and feeding habitat for a variety of species of dragonfly and damselfly, including the nationally scarce hairy dragonfly *Brachytron pratense*. As identified within ***Chapter 20 Water Resources and Flood Risk*** of the Environmental Statement (ES) (APP-068), several SSSI units are of particular relevance to the proposed crossing location (and from a water resources perspective) as the Hundred River flows through or immediately adjacent to the SSSI approximately 1.4km downstream. The Leiston-Aldeburgh SSSI units which are of particular relevance (as they are identified in the SSSI citation as containing comparable habitat to that associated with the habitat requirements of the Sandlings SPA qualifying features) are listed below. Consideration of these SSSI units has been made in the screening of LSE that has been undertaken and presented in ***Table 1***:

- **Unit 10**: Fen, marsh and swamp. Referred to as 'The Fens' on Ordnance Survey mapping, this is an area of wetland that is dominated by common reed *Phragmites australis*. This unit was assessed in 2009 as being in favourable condition and is approximately 1.6km downstream from the Hundred River crossing location.
- **Unit 11**: Standing open water and canals. The Meare is a shallow eutrophic water body underlain by a peat substrate, which is connected to other wetland habitats such as carr woodland, swamp and fen meadows. This unit was assessed in 2009 as being in favourable condition and is approximately 2.4km downstream from the Hundred River crossing location.
- **Unit 12**: Broadleaved, mixed and yew woodland. An area of wet woodland bisected by the river and connected drainage channels. This unit was assessed in 2009 as being in favourable condition and is approximately 1.4km downstream from the Hundred River crossing location.
- **Unit 14**: Neutral grassland. This area, known as Church Farm Marshes, consists of grassland bisected by a network of largely trapezoidal drainage ditches. Water quality is reported to be good, and the channels support a diverse plant community (Natural England 2021). This unit was assessed in

2010 as being in favourable condition and is approximately 2.4km downstream.

11. Where the Leiston-Aldeburgh SSSI unit habitat classification is comparable with the habitat classification of the Sandlings SPA, consideration of the SSSI habitat has also been made in the LSE presented in ***Table 1***. For example, Unit 10 of the Leiston-Aldeburgh SSSI is characterised as being fen, marsh and swamp. This habitat classification is comparable to the Sandlings SPA habitat of bogs, marshes, water fringed vegetation, fens (N07). Therefore, in this instance, and as shown in ***Table 1***, both the Unit 10 Leiston-Aldeburgh SSSI habitat and the Sandlings SPA N07 habitat has been considered together.

# 3 Sandlings SPA

## 3.1 Supporting Habitats

12. In the 19th Century the area of the Sandlings SPA was dominated by heathland. During the 20th Century, large areas of heath were planted with either blocks of commercial conifer forest or converted into arable land. Due to a lack of traditional management measures, the remnant areas of heath have been subject to successional changes which has also enabled the spread of bracken, shrubs and trees.

13. The areas of remaining heath support both acid grassland and heather-dominated plant communities.

14. The populations of nightjar and woodlark known to use the Sandlings SPA have adapted to breeding in the areas of large conifer forest as well as within areas of open ground.

15. Section 4 of the JNCC the Sandlings SPA Natura 2000 Standard Data Form (JNCC 2016) lists nine habitat types which characterise the Sandlings SPA:

- N09 – Dry grassland, Steppes;
- N07 – Bogs, marshes, water fringed vegetation, fens;
- N06 – Inland water bodies (standing water, running water);
- N17 – Coniferous Woodland;
- N23 – Other land (including towns, villages, roads, waste places, mines, industrial sites;
- N16 – Broad-leaved deciduous woodland;
- N14 – Improved grassland;
- N08 – Heath, scrub, maquis and garrigue, phygrana; and
- N19 – Mixed woodland.

16. Whilst acknowledging that the primary qualifying features of the Sandlings SPA are nightjar and woodlark, a review of the habitat types listed above has been undertaken to inform this screening exercise. A review of the Department for Environment Food and Rural Affairs' online interactive mapping facility (https://magic.defra.gov.uk, accessed 5th February 2021) identified that there are no areas of coniferous woodland (N17), broad-leaved deciduous woodland (N16) and improved grassland (N14) within the SSSI units that overlap with the Sandlings SPA. However, in order to ensure that a precautionary approach is taken, these habitats have been included within this assessment.

## 3.2 Nightjar

17. Nightjar is a migrant species and is only present in Britain from April to August. The species is primarily crepuscular and nocturnal in behaviour, being most active around dusk and dawn. It is insectivorous and nests on the ground, preferring open habitats. Historically, nightjars occurred primarily on heathland, in woodland clearings and on downland, at the interface between woodlands and the open-ground habitats. Nightjars in Suffolk have been observed to prefer to nest on heathlands and young coniferous plantation up to five years old (Ravenscroft 1989).

18. In forested areas, nightjars prefer areas with a ground cover of litter (dead leaves, twigs, etc.), moss, short grass, bracken and shrubs (Bowden & Green 1991). These conditions prevail in clear-fells and young restocks, which are readily colonised by nightjars and provide a combination of nest clearings, nest cover, scattered song posts and foraging habitat, notably in restocks of 3–5 years old and less than 2m in height (Ravenscroft 1989, Bowden & Green 1991). Thereafter, nightjar density declines with forest stand age.

19. Birds may forage short distances from the nest, particularly when they have eggs or young (Cross et al. 2005), although distances have been recorded up to 3.1km (Alexander & Cresswell 1990). A study of radio-tracked nightjars in southeast England by Sharps et al. (2015) showed that nightjars travelled a mean maximum distance of 747m from their territory centre each night. When leaving their smaller song territories, individuals preferred pre-closure canopy forest and newly planted forest as well as open grazed grass heath.

20. The British nightjar population was estimated to be 4,606 males in 2004, representing a 36% increase in 12 years (Conway et al. 2007). The 2004 survey did however reveal a decline in the Suffolk population (284 males) by around 11% albeit with a relatively low confidence in results. According to Natural England's (2015) Site Improvement Plan for the Sandlings, the nightjar population on the Suffolk coast has declined by 66% since the SPA notification in 2001. The main pressures identified within the SPA are inappropriate scrub control, deer, air pollution and public access/disturbance Natural England (2015). Assuming that the Sandlings SPA population is representative of Suffolk coastal population trends, based on a 66% reduction since citation in 2001, the SPA population may have declined from 109 to around 37 pairs.

## 3.3 Woodlark

21. Woodlark breeding habitat includes heaths, scrubland, woodland edges, neglected farmland and golf courses, avoiding areas of intensive agriculture. In England, the largest population is in the Breckland region of Suffolk and Norfolk, where most pairs breed in areas of pine forest that have been felled and replanted (Forrester et al. 2007). The species is resident, feeding on seeds and insects, and moves to farmland stubbles in autumn and early winter. Woodlark is an early breeder, potentially beginning in mid-February within the SPA.

22. Since the early 1990s there have been significant changes to core woodlark habitat types in England (Conway et al. 2007). The age structure and species composition of forestry plantations has changed due to different management regimes and the ageing of forestry plantations. Between 1997 and 2006 in the Suffolk Sandlings, a substantial shift in habitat association for woodlarks meant a large decline in plantations / woodland, but a two-fold increase on heathland (mainly grass-heathland) and a three-fold proportional increase on farmland (especially non-cropped habitats). Woodlarks now occupy both planted forests and heathland, including grass heaths, in similar proportions (Langston et al. 2007).

23. The national woodlark population was last estimated at 3,064 territories in 2006, which represented an increase of 88% since 1997 (Conway et al. 2009). Of this, it was estimated that 209 territories were within the Suffolk Sandlings (which includes a larger area than the Sandlings SPA), which represented a decline in numbers, contrary to the national trend.

24. According to Natural England's (2015) Site Improvement Plan for the Sandlings, the woodlark population on the Suffolk coast has declined by 65% since the Sandlings SPA notification in 2001. The main pressures identified within the SPA are inappropriate scrub control, deer, air pollution and public access/disturbance Natural England (2015).

25. Assuming that the Sandlings SPA population is representative of wider Suffolk coastal population trends, based on a 65% reduction since citation in 2001, the SPA population may have declined from 154 to around 54 pairs.

# 4 Screening for LSE

## 4.1 Crossing Works

26. The construction techniques proposed for the Hundred River crossing are set out within the ***Outline Watercourse Crossing Method Statement*** (~~an updated version has been submitted at Deadline 6,~~ document reference ExA.AS-~~5.D6.V2~~29.D11.V4), therefore only key details are repeated here.

27. The Hundred River crossing will be constructed using a conventional open cut methodology. A number of factors will influence this crossing method, including depth of water, available space, duration of works, riverbed conditions, accessibility and potential for ingress of water. It is anticipated that the ducting to accommodate the onshore cables will be buried a minimum of 1.2m below the bed of the riverbed and the associated banks / defences at the Hundred River crossing.

28. Construction works to lay onshore cable ducts associated with the Hundred River crossing (for East Anglia TWO and East Anglia ONE North in parallel) and associated reinstatement works (excluding any seasonally dependant planting) are anticipated to be completed within two months. Preparation of the work areas at either side of the Hundred River is expected to take around 1 month. Other works such as construction of joint bays for the jointing of onshore cables will be undertaken beyond the immediate area of the Hundred River crossing.

29. Whilst ducting for both East Anglia TWO and East Anglia ONE North will be installed in parallel, should these projects be constructed sequentially it is envisaged that when the second project moves into the construction phase, the only construction works required at the Hundred River crossing will be the undertaking of duct integrity testing, duct dewatering, duct cleaning (if required) and the pulling of electrical cables through the pre-installed cable ducts, albeit such works are undertaken from outside the immediate vicinity of the Hundred River.

## 4.2 Potential Effects on the Sandlings SPA Qualifying Features and Supporting Habitats

30. The following effects have been considered to determine if they have the potential to affect nightjar or woodlark and their supporting habitats.

### 4.2.1 Effect 1 – Direct Effects upon Features and Supporting Habitats

31. The location of the Hundred River crossing is approximately 760m (straight-line distance) west of the Sandlings SPA at its nearest point. However, the course of the river flows in a southerly direction for approximately 1.4km before crossing

over the boundary into the Sandlings SPA (***Figure 2***). Given these distances, the crossing works will not result in direct effects upon or loss of supporting habitat for the interest features of the Sandlings SPA (i.e. nightjar and woodlark) for which it is afforded its protection.

### 4.2.2 Effect 2 – Construction Disturbance

32. Breeding nightjar or woodlark within the Sandlings SPA may be disturbed during the construction period, including by works outside of the SPA, thereby impacting on the population and/or distribution.

33. For nightjar, Ruddock & Whitfield's (2007) expert review on disturbance indicated an active disturbance upper limit of 100m during chick rearing. Murison (2002) however found a significant negative impact on nightjar density within 500m of a path, due to a combination of human disturbance and consequential predation effects. Forestry Commission Scotland (2006) advocated a safe working distance of forestry operations from nightjar nest sites of 50-200m, based on Currie & Elliott (1997) who advocated set-back working distances of 200m at egg stage and 50-100m at chick stage. More recently, Shewring & Carrington (2017) reported on nightjar monitoring during the construction period of the Pen y Cymoedd Wind Farm in Wales where they found no significant difference detected between chick numbers or nest success at nests within and outside 200m disturbance buffers and suggested that the current standard 200m disturbance buffer is likely to be excessive.

34. For woodlark, Mallord *et al.* (2006) found that although the distribution of woodlarks on Dorset heaths was significantly affected by the presence of people and dogs (particularly within distances of up to 400m from a car park), there was no effect of disturbance on nest survival or productivity. Dolman (2018) conducted a study of 147 woodlark nests in Breckland Forest, which showed strong evidence that neither woodlark nest success, nor the productivity of successful nests, were affected by the levels of recreational activity observed.

### 4.2.3 Effect 3 – Changes to the Sediment Regime and Channel Flow of the Hundred River

35. The Hundred River will be crossed using a trenched technique, whereby temporary dams (composed of sandbags, straw bales and ditching clay, or another suitable technique) will be installed upstream and downstream of the crossing point. The cable trench will then be excavated within the area of dry riverbed between the dams, with river flow maintained throughout the works through the use of a temporary pump, pipe/flume.

36. The installation of the cable trench will directly disturb the bed and banks of the Hundred River and could potentially result in the enhanced scour and increased

sediment supply. The bed and banks will be reinstated on the completion of the works, to their original level, position, planform and profile, therefore any potential impacts associated with sediment regime would be temporary (i.e. for the two months of construction for both Projects).

37. The temporary dams may result in reduced flow and sediment conveyance (particularly of coarse sediment), create upstream impoundment, affect patterns of erosion and sedimentation, impede river continuity, increase turbidity and potentially encourage fine sedimentation on a short section of the bed upstream. Changes to flow conditions could also result in a reduction in the dissolved oxygen concentrations supported in the Hundred River upstream of the impoundment area (i.e. where the temporary dam is located). These activities could therefore reduce the physical habitat value of the watercourse for aquatic plants, invertebrates and fish species in the immediate vicinity of the upstream dam. These impacts will be temporary (i.e. for the two months of construction for both Projects) and will be reversed once the temporary impounding structures are removed (i.e. as a result of natural bed scour and sediment transport processes, which would remobilise any accumulations of unconsolidated fine sediments once the normal flow regime has been reinstated).

38. A temporary bridge or culvert will be required to allow the workers to cross the Hundred River. The installation and removal of this temporary structure within the dewatered reach of the Hundred River will directly disturb the bed and banks of the watercourse and result in the direct loss of natural geomorphological features within the footprint of the structure. This impact will be reversible once the temporary structure has been removed and the bed and banks reinstated.

39. The temporary dams may also act as a barrier to the movement of fish and other aquatic organisms (including migrating eels and spawning fish). However, impacts are only anticipated when barriers are in place in the channel (i.e. during trenching and the installation of temporary crossing structures), and river continuity will be restored once temporary barriers were removed. The temporary crossing will be designed to ensure that fish passage is unimpeded.

### 4.2.4 Effect 4 – Pollution

40. Measures to prevent the release of contaminants into the watercourse are set out within ***Section 5*** and ***Section 6*** of the ***Outline Code of Construction Practice*** (~~an updated version has been submitted at Deadline 6,~~ document reference 8.1) and the ***Outline Watercourse Crossing Method Statement*** (~~an updated version has been submitted at Deadline 6,~~ document reference ExA.AS-~~5.D6.V2~~29.D11.V4). Given the implementation of these standard measures to avoid pollution, it is considered that the risk of release of contaminants is low.

However, in line with post 'Sweetman'[1] practice, mitigation measures cannot be taken into account in screening decisions hence pollution is taken forward as a potential effect within this assessment.

## 4.3 LSE Screening

41. ***Table 1*** presents the Screening for LSE that has been undertaken which considers the likely effects of the proposed construction works associated with the Hundred River crossing on the Sandlings SPA. This is the key test that is required to conclude whether there will or will not be no LSE on this European site. It should be noted that whilst the Applicants consider that the habitats listed in ***section 3.1*** are not present, they have been included to ensure the assessment is precautionary

[1] People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17).

**Table 1 Screening of LSE upon the Sandlings SPA Arising from the Upstream Crossing of the Hundred River**

| Interest Feature | Directly Impacted | Indirectly Impacted | Rationale for Conclusion | Risk of LSE | Screening Decision |
|---|---|---|---|---|---|
| **Species Referred to in Article 4 and Listed in Annex II** | | | | | |
| **Nightjar** ***Caprimulgus europaeus*** | No | No | No nightjar breeding activity was recorded at the crossing location or within its surroundings, either during baseline surveys in 2018 and 2019, or from Royal Society for the Protection of Birds (RSPB) data collected from 2009 to 2018. Furthermore, the habitat preference of nightjars is primarily heathland or within woodland clearings. These habitats have not been recorded within the area of the crossing.<br>The crossing will not directly damage or affect the primary habitat which these bird species use. Furthermore, the proposed works will not require the removal of any suitable habitat for nightjars<br>All construction activity related to the crossing would take place outside of potential disturbance ranges from the Sandlings SPA. | No | Screened Out |
| **Woodlark** ***Lullula arborea*** | No | No | Whilst the breeding habitat for woodlarks can include scrubland and woodland edges, breeding recorded within the Sandlings SPA has primarily been within heathland, and no breeding woodlark has been recorded within the vicinity of the crossing location either during baseline surveys in 2018 and 2019, or from RSPB data collected from 2009 to 2018.<br>The crossing works will not directly damage or affect the primary habitat which these bird species use. Furthermore, the proposed works will not require the removal of any suitable habitat for woodlark downstream of the proposed working area.<br>All construction activity related to the crossing would take place outside of potential disturbance ranges from the SPA. | No | Screened Out |
| **Supporting Habitats within SPA Boundary** | | | | | |

| Interest Feature | Directly Impacted | Indirectly Impacted | Rationale for Conclusion | Risk of LSE | Screening Decision |
|---|---|---|---|---|---|
| **Dry grassland, Steppes (N09)**<br>**(Leiston-Aldeburgh SSSI Unit 14)** | No | Potential | This habitat has not been recorded at the crossing location and will therefore not be directly affected by the proposed construction works.<br>The closest area of dry grassland to the crossing location and which falls within the boundary of the Sandlings SPA is at least 2km downstream.<br>There is potential for downstream effects on this habitat | Yes | Screened In |
| **Bogs, marshes, water fringed vegetation, fens (N07)**<br>**(Leiston-Aldeburgh SSSI Unit 10)** | No | Potential | This habitat has not been recorded at the crossing location and will therefore not be directly affected by the proposed construction works.<br>The closest area of bog and marsh to the crossing location and which falls within the boundary of the Sandlings SPA is at least 1.4km downstream.<br>There is potential for downstream effects on this habitat | Yes | Screened In |
| **Inland water bodies (standing water, running water) (N06)**<br>**(Leiston-Aldeburgh SSSI Unit 11)** | No | Potential | The Hundred River contains running water and although is not located within the SPA or SSSI boundary, there is potential for downstream effects on this habitat. | Yes | Screened In |
| **Coniferous woodland (N17)** | No | Potential | Whilst the Applicants consider that this habitat is not present within the SPA (see ***section 3.1***) it has been included to ensure the assessment is precautionary<br>There is potential for downstream effects on this habitat | Yes | Screened In |

| Interest Feature | Directly Impacted | Indirectly Impacted | Rationale for Conclusion | Risk of LSE | Screening Decision |
|---|---|---|---|---|---|
| **Other land (including towns, villages, roads, waste places, mines, industrial sites (N23)** | No | Potential | There is potential for downstream effects on this habitat | Yes | Screened In |
| **Broad-leaved deciduous woodland (N16)**<br>**(Leiston-Aldeburgh SSSI Unit 12)** | No | Potential | This habitat is located on the west bank of the proposed Hundred River crossing location.<br>Whilst the Applicants consider that this habitat is not present within the SPA (see ***section 3.1***) it has been included to ensure the assessment is precautionary<br>There is potential for downstream effects on this habitat | Yes | Screened In |
| **Improved grassland (N14)** | No | Potential | This habitat has not been recorded within the crossing location.<br>Whilst the Applicants consider that this habitat is not present within the SPA (see ***section 3.1***) it has been included to ensure the assessment is precautionary<br>There is potential for downstream effects on this habitat. | Yes | Screened In |
| **Heath, scrub, maquis and garrigue, phygrana (N08)** | No | Potential | This habitat has not been recorded within the crossing location and will therefore not be directly affected by the proposed construction works.<br>The closest area of heath to the crossing location and which falls within the boundary of the Sandlings SPA is at least 1.4km downstream.<br>There is potential for downstream effects on this habitat. | Yes | Screened In |

| Interest Feature | Directly Impacted | Indirectly Impacted | Rationale for Conclusion | Risk of LSE | Screening Decision |
|---|---|---|---|---|---|
| **Mixed woodland (N19)**<br>**(Leiston-Aldeburgh SSSI Unit 12)** | No | Potential | This habitat has not been recorded within the crossing location and will therefore not be directly affected by the proposed construction works.<br>The closest area of mixed woodland (classified as wet woodland in the SSSI unit description) to the crossing location and which falls within the boundary of the Sandlings SPA is at least 1.4km downstream.<br>There is potential for downstream effects on this habitat. | Yes | Screened In |

# 5 Habitat Regulations Assessment

42. This section further considers the potential for adverse effects on the integrity of the Sandlings SPA due to indirect effects from the Hundred River crossing works upon the supporting habitats of the SPA.

## 5.1 Mitigation Measures

43. As presented in ***Section 4*** of the ***Outline Watercourse Crossing Method Statement*** (~~an updated version has been submitted at Deadline 6,~~ document reference ExA.AS-~~5.D6.V2~~29.D11.V4), a suite of mitigation measures has been identified that will be implemented during the proposed crossing works.

44. A summary of the key mitigation measures includes, but not limited to:

- Works will be undertaken during times of low flow;
- Erosion control measures (e.g. coir matting) will be installed and maintained throughout the works;
- Sediment interception measures will be in-situ during all works;
- Water quality monitoring will be undertaken throughout the works;
- No materials will be stored within Flood Zone 2 or 3;
- Spoil from excavation works will be stored outside of the Hundred River and beyond the extent of Flood Zone 2 and 3 where possible, to minimise the risk of silt runoff into the river and displacement of water in the event of a flood;
- Over-pumping will be undertaken using non-consumptive operations to ensure that the flow rate downstream of the crossing location remains the same as the upstream rate and channel capacity will remain unchanged in the event of a flood event;
- Monitoring to ensure flow rate up and downstream of crossing location will be undertaken;
- No vehicles will cross the Hundred River;
- Temporary bailey bridge (or similar) will be used to allow pedestrian access across the Hundred River by the workforce;
- All required permits and licences will be obtained and adhered to during the works;
- Measures to prevent the release of contaminants into the watercourse will be implemented as set out within section 5 and section 6 of the ***Outline Code of Construction Practice*** (~~an updated version has been submitted at Deadline 6,~~ document reference 8.1) and ***Outline Watercourse Crossing Method***

***Statement*** (~~an updated version has been submitted at Deadline 6,~~ document reference ExA.AS-~~5.D6.V2~~29.D11.V4);

- All waste will be removed from the working area and disposed of in accordance with the approved site waste management plan; and
- On completion of works, the riverbed and banks will be reinstated to its pre-construction condition, including the restoration of the river channel to its original level to minimise potential impacts of flooding and in-channel and riparian habitats.

## 5.2 Assessment

45. ***Table 2*** presents the assessment of effect on those supporting habitats not screened out for potential LSE.

**Table 2 Assessment of Effect on the Sandlings SPA Arising from the Upstream Crossing of the Hundred River**

| Interest Feature / Supporting Habitat | Adverse Effect on Integrity | Rationale for Conclusion |
|---|---|---|
| **Dry grassland, Steppes (N09)**<br>**(Leiston-Aldeburgh SSSI Unit 14)** | No | The crossing works methodology (i.e. use of over-pumping) will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1*** above, no indirect impacts on this habitat is anticipated given their distance (i.e. at least 2km downstream) from the Hundred River crossing location. |
| **Bogs, marshes, water fringed vegetation, fens (N07)**<br>**(Leiston-Aldeburgh SSSI Unit 10)** | No | The crossing works methodology (i.e. use of over-pumping) will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1*** above, no indirect impacts on this habitat is anticipated given their distance (i.e. at least 1.4km downstream) from the crossing location. |
| **Inland water bodies (standing water, running water) (N06)**<br>**(Leiston-Aldeburgh SSSI Unit 11)** | No | As detailed within the Outline Watercourse Crossing Method Statement, the following key mitigation measures will be implemented and adhered to during the crossing:<br>• The proposed over-pumping method will be agreed with the Environment Agency prior to the works commencing and will be in accordance with approved Code of Construction Practice secured under Requirement 22 of the DCO.<br>• Any over-pumping at the Hundred River crossing will be via a non-consumptive operation (i.e. no transmission loss). This approach will ensure that the flow rate downstream of the Hundred River crossing is the same as the flow rate upstream and will also ensure that there is sufficient capacity within the channel and the floodplain to maintain flows during a flood event.<br>• Erosion control measures (e.g. coir matting) will be installed and maintained throughout the works;<br>• Sediment interception measures will be in-situ during all works<br>• Monitoring to ensure flow rate downstream of crossing location will be undertaken<br>• Monitoring of the water quality will be undertaken.<br>Following implementation of the mitigation measures outlined above, no indirect impacts on this habitat is anticipated. |

| Interest Feature / Supporting Habitat | Adverse Effect on Integrity | Rationale for Conclusion |
|---|---|---|
| **Coniferous woodland (N17)** | No | Although this habitat has not been recorded at the crossing location or within the SPA boundary, it was screened in to ensure a precautionary approach.<br><br>The crossing works methodology (i.e. use of over-pumping) will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1***, no indirect impacts on this habitat is anticipated should it be present. |
| **Other land (including towns, villages, roads, waste places, mines, industrial sites (N23)** | No | There will be no direct or indirect impacts on this habitat type given that the mitigation measures outlined above will be implemented and that the flow rate downstream of the crossing is the same as the flow rate upstream. In addition, the capacity of the channel and the floodplain will be maintained to ensure flood risk remains unchanged. |
| **Broad-leaved deciduous woodland (N16)**<br><br>**(Leiston-Aldeburgh SSSI Unit 12)** | No | Although this habitat has not been recorded at the crossing location or within the SPA boundary, it was screened in to ensure a precautionary approach.<br><br>The crossing works methodology (i.e. use of over-pumping) will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1***, no indirect impacts on this habitat is anticipated should it be present. |
| **Improved grassland (N14)** | No | Although this habitat has not been recorded at the crossing location or within the SPA boundary, it was screened in to ensure a precautionary approach.<br><br>The crossing works methodology (i.e. use of over-pumping) will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1***, no indirect impacts on this habitat is anticipated should it be present. |
| **Heath, scrub, maquis and garrigue, phygrana (N08)** | No | The proposed works will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1*** above, no indirect impacts on this habitat is anticipated. |

| Interest Feature / Supporting Habitat | Adverse Effect on Integrity | Rationale for Conclusion |
|---|---|---|
| **Mixed woodland (N19)**<br><br>**(Leiston-Aldeburgh SSSI Unit 12)** | No | The proposed works will ensure that flow rates downstream of the crossing location will remain the same as the upstream rate and therefore there will be no changes in the hydrological conditions to this habitat. Consequently, and following the implementation of the mitigation measures outlined in ***section 5.1*** above, no indirect impacts on this habitat is anticipated given its distance (i.e. at least 1.4km downstream) from the crossing location. |

# 6 Summary

46. This assessment has provided a screening for LSE (***Table 1***) and following consideration of the embedded mitigation (as presented in the ***Outline Watercourse Crossing Method Statement*** (document reference ExA.AS-~~5.D6.V2~~29.D11.V4)) to be applied at the Hundred River crossing considered the potential for AEoI of the Sandlings SPA through indirect effects upon its supporting habitats (***Table 2***). It is considered that the works associated with the Hundred River crossing will not result in AEoI of the Sandlings SPA.

47. The precise working method for crossing the Hundred River will be agreed through the discharge of DCO Requirement 22(2)(k) post-consent and through an application for a Flood Risk Activity Permit prior to commencement of the works associated with the Hundred River crossing from the Environment Agency.

48. The method statement will also be agreed with Natural England. Furthermore, and through the implementation of the identified mitigation measures, the potential for downstream impacts on the Sandlings SPA and its qualifying features will be managed to minimise sediment generation from construction activities associated with the crossing of the Hundred River.

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