

East Anglia TWO Offshore Windfarm

Appendix 22.5

Onshore Ecology Cumulative Impact Assessment with the Proposed East Anglia ONE North Project

Preliminary Environmental Information

Volume 3

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Table A22.2	Scenario 2 Realistic Worst Case Assumptions
Table A22.3	Table A22.3 Summary of Scenario 1 and Scenario 2 Realistic Worst Case Assumptions

Glossary of Acronyms

CCS	Construction Consolidation Sites
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
ES	Environmental Statement
HDD	Horizontal Directional Drilling
MW	Megawatt
NGET	National Grid Electricity Transmission
OHL	Overhead Line
PEIR	Preliminary Environmental Information Report
SPA	Special Protection Area

Glossary of Terminology

Applicant	East Anglia TWO Limited. ScottishPower Renewables is the parent company of East Anglia TWO limited
Construction consolidation sites	Compounds which will contain laydown, storage and work areas for onshore construction works. The HDD construction compound will also be referred to as a construction consolidation site.
Development Area	Area containing all onshore and offshore infrastructure, transmission works, construction consolidation sites, and mitigation areas.
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one offshore 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 cable connection to the National Grid.
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.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Jointing Bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers or above ground cabinets next to the cable trench housing electrical earthing links.
Mitigation areas	Areas captured within the Development Area specifically for mitigating expected or anticipated impacts.
National Grid infrastructure	The proposed East Anglia TWO project will require connection into an additional substation for ultimate connection to national electricity grid. The required National Grid infrastructure comprising a National Grid substation, connection to the existing electricity pylons and associated works will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid overhead line works	Works required to upgrade the existing electricity pylons and overhead lines to transport electricity from the National Grid substation to the national electricity grid
National Grid overhead line works area	The proposed area for National Grid overhead line realignment works.

National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation required to connect the proposed East Anglia TWO project to the national electricity grid.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
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 and two fibre optic cables.
Proposed onshore development Area	Onshore transmission works, mitigation areas and temporary construction facilities such as access roads or construction consolidation sites and National Grid infrastructure.
Onshore infrastructure	The combined name for all infrastructure associated with the proposed East Anglia TWO project from landfall to grid connection.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment, both within and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Onshore study area	All onshore areas being considered for the placement of onshore infrastructure or temporary construction consolidation sites. This includes areas being considered for National Grid infrastructure, East Anglia TWO onshore substation, onshore cable corridor and landfall.
Onshore transmission works	Landfall, onshore cable route and onshore substation location and National Grid substation location. This does not include temporary construction facilities such as access roads or construction consolidation sites.
Transition Bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

22.5 Onshore Ecology Cumulative Impact Assessment with the proposed East Anglia ONE North Project

22.1 Introduction

1. This appendix covers the cumulative impact assessment of the proposed East Anglia TWO project with the proposed East Anglia ONE North project in relation to onshore ecology.
2. The East Anglia ONE North offshore windfarm project (the proposed East Anglia ONE North project) is also the pre-application stage. The proposed East Anglia ONE North project will have a separate Development Consent Order (DCO) application but is working to the same programme of submission as the proposed East Anglia TWO project. The two projects will share the same landfall location and cable route and the two onshore substations will be co-located and feed into the same National Grid substation.
3. The onshore ecology proposed East Anglia TWO project Cumulative Impact Assessment (CIA) will therefore initially consider the cumulative impact with only the proposed East Anglia ONE North project against two different construction scenarios (i.e. construction of the two projects simultaneously and sequentially). The realistic worst case scenario of each impact is then carried through to the main body of the CIA assessment which considers other developments which are in close proximity to the proposed East Anglia TWO project.
4. For a more detailed description of the CIA please refer to **Chapter 5 EIA Methodology**.

22.2 Construction Scenarios Realistic Worst Case

5. This appendix considers the proposed East Anglia TWO project and the proposed East Anglia ONE North project under two construction scenarios:
 - Scenario 1 - the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously; and
 - Scenario 2 - the proposed East Anglia TWO project and the proposed East Anglia ONE North project are built sequentially.

6. As discussed in **section 22.1**, the realistic worst case (based on the assessment of these two construction scenarios) for each impact is then carried through to the wider CIA which considers other developments, projects or plans which have been screened into the CIA assessment for the proposed East Anglia TWO project.
7. It should be noted that the operational phase impacts on onshore ecology will be the same irrespective of the construction scenario. Therefore, operational impacts identified in Scenario 1 will be the same as those for Scenario 2.
8. Mitigation measures for the proposed East Anglia TWO project and proposed East Anglia ONE North project will be the same. These are detailed in **Chapter 22 Onshore Ecology**.

22.2.1 Scenario 1

9. **Table A22.1** presents the realistic worst case parameters of Scenario 1. In this instance, the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously.

Table A22.1 Scenario 1 Realistic Worst Case

Impact	Parameter	Notes
Construction		
Impacts related to the landfall	HDD temporary works area: 13,300m ² (70m x 190m) Transition bay excavation footprint (for 4 transition bays): 3,108m ² (37m x 42m) Landfall CCS: 40,950m ² (210m x 195m) Landfall transition bays approximate quantity of spoil material (for 4 transition bays): 908m ³	Landfall to be achieved via HDD. No beach access required.
Impacts related to the onshore cable corridor	Onshore cable route: 574,720m ² (8,980m x 64m) Jointing bay construction excavation footprint: 570m ² (30.6m x 18.6m). Total for 72 jointing bays: 41,040m ² (570m ² x 36) HDD (retained as an option to cross SPA / SSSI): <ul style="list-style-type: none"> • Entrance pit CCS (x1): 13,650m² (195m x 70m) • Exit pit CCS (x1): 5,850m² (195m x 30m) Onshore cable route CCS: 40,950m ² (210m x 195m). Total for 5 CCS: 204,750m ²	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field boundaries or roads as far as practical. Two link boxes sit underground beside each jointing bay at a depth of approximately 1.2m. The construction footprint of these is included in the jointing bay construction excavation

Impact	Parameter	Notes
	<p>(40,950m² x 5)</p> <p>Temporary roads:</p> <ul style="list-style-type: none"> Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m² Onshore cable route and substation access haul road (9m width): 18,675m² Temporary access road: 23,495m² <p>Onshore cable trench approximate quantity of spoil material: 26,642m³</p>	footprint.
Impacts related to the onshore substation(s)	<p>Onshore substation CCS: 17,100m² (190m x 90m). Total for 3 CCS: 51,300m²</p> <p>Permanent footprint (used as CCS during construction): 36,100m² (190m x 190m). Total for 2: 72,200m²</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	Construction access is included above as the onshore cable route and substation access haul road.
Impacts related to the National Grid Infrastructure	<p>National Grid substation CCS: 78,750m² (250m x 315m)</p> <p>Permanent footprint (used as CCS during construction): 45,500m² (325m x 140m)</p>	<p>Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description.</p> <p>Construction access is included above as the onshore cable route and substation access haul road.</p> <p>Operational access is included above as the substation operational access road,</p>
Operation		
Impacts related to the landfall	4 transition bays will be installed underground, each with an operational volume of 227m ³	Transition bays will be buried approximately 1.2m underground – there will no

Impact	Parameter	Notes
		above ground infrastructure.
Impacts related to the onshore cable corridor	72 jointing bays will be installed underground, each with an operational volume of 77m ³ 144 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m ³	Jointing bays will be buried approximately 1.2m underground – there will be no above ground infrastructure. Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.
Impacts related to the onshore substation(s)	Operational footprint: 36,100m ² (190m x 190m). Total for 2: 72,200m ² Substation operational access road: 12,800m ² (1,600m x 8m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m ² (325m x 140m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR). Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description .
Decommissioning		
<p>No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left <i>in situ</i>. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.</p>		

22.2.2 Scenario 2

10. Scenario 2, and **Table A22.2**, represents the realistic worst case scenario in the eventuality that the proposed East Anglia TWO project and proposed East Anglia ONE North project are built with a construction gap.
11. Scenario 2 assumes that when permission is granted, the proposed East Anglia TWO project will be constructed as soon as permission is granted. The proposed East Anglia ONE North project will leave the largest possible gap (between the reinstatement of the proposed East Anglia TWO project and start of construction for the proposed East Anglia ONE North project) to begin construction within the consent period. Further detail regarding the likely construction gap is provided in **Chapter 5 EIA Methodology**.

Table A22.2 Scenario 2 Realistic Worst Case

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Construction			
Impacts related to the landfall	HDD temporary works area: 7,000m ² (70m x 100m) Transition bay excavation footprint (for 2 transition bays): 1,554m ² (37m x 42m) Landfall CCS: 18,400m ² (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m ³	HDD temporary works area: 7,000m ² (70m x 100m) Transition bay excavation footprint (for 2 transition bays): 1,554m ² (37m x 42m) Landfall CCS: 18,400m ² (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m ³	Landfall to be achieved via HDD. No beach access required.
Impacts related to the onshore cable corridor	Onshore cable route: 287,360m ² (8,980m x 32m) Jointing bay construction excavation footprint: 570m ² (30.6m x 18.6m). Total for 36 jointing bays: 20,520m ² (570m ² x 36) HDD (retained as an option to cross SPA / SSSI): <ul style="list-style-type: none"> Entrance pit CCS (x1): 7,000m² (100m x 70m) Exit pit CCS (x1): 	Onshore cable route: 287,360m ² (8,980m x 32m) Jointing bay construction excavation footprint: 570m ² (30.6m x 18.6m). Total for 36 jointing bays: 20,520m ² (570m ² x 36) HDD (retained as an option to cross SPA / SSSI): <ul style="list-style-type: none"> Entrance pit CCS (x1): 7,000m² (100m x 70m) Exit pit CCS (x1): 3,000m² 	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field boundaries or roads as far as practical. Two link boxes sit underground beside

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
	<p>3,000m² (100m x 30m)</p> <p>Onshore cable route CCS: 18,400m² (160m x 115m). Total for 5 CCS: 92,000m² (18,400m² x 5)</p> <p>Temporary roads:</p> <ul style="list-style-type: none"> Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m² Onshore cable route and substation access haul road (9m width): 18,675m² Temporary access road: 23,495m² <p>Onshore cable trench approximate quantity of spoil material: 13,321m³</p>	<p>(100m x 30m)</p> <p>Onshore cable route CCS: 18,400m² (160m x 115m). Total for 5 CCS: 92,000m² (18,400m² x 5)</p> <p>Temporary roads:</p> <ul style="list-style-type: none"> Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m² Onshore cable route and substation access haul road (9m width): 18,675m² Temporary access road: 23,495m² <p>Onshore cable trench approximate quantity of spoil material: 13,321m³</p>	<p>each jointing bay at a depth of approximately 1.2m. The construction footprint of these is included in the jointing bay construction excavation footprint.</p>
Impacts related to the onshore substation	<p>Onshore substation CCS: 17,100m² (190m x 90m)</p> <p>Permanent footprint (used as CCS during construction): 36,100m² (190m x 190m)</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	<p>Onshore substation CCS: 17,100m² (190m x 90m)</p> <p>Permanent footprint (used as CCS during construction): 36,100m² (190m x 190m)</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	<p>Construction access is included above as the onshore cable route and substation access haul road.</p>
Impacts related to the National Grid Infrastructure	<p>National Grid substation CCS: 78,750m² (250m x 315m)</p> <p>Permanent footprint (used as CCS during construction): 45,500m² (325m x 140m)</p>	<p>National Grid substation CCS: 78,750m² (250m x 315m)</p> <p>Permanent footprint (used as CCS during construction): 45,500m² (325m x 140m)</p>	<p>Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental</p>

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
			<p>Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description.</p> <p>Construction access is included above as the onshore cable route and substation access haul road.</p> <p>Operational access is included above as the substation operational access road,</p>
Operation			
Impacts related to the landfall	2 transition bays will be installed underground, each with an operational volume of 227m ³	2 transition bays will be installed underground, each with an operational volume of 227m ³	Transition bays will be buried approximately 1.2m underground – there will no above ground infrastructure.
Impacts related to the onshore cable corridor	<p>36 jointing bays will be installed underground, each with an operational volume of 77m³</p> <p>72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m³</p>	<p>36 jointing bays will be installed underground, each with an operational volume of 77m³</p> <p>72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m³</p>	<p>Jointing bays will be buried approximately 1.2m underground – there will no above ground infrastructure.</p> <p>Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.</p>
Impacts related to the onshore substation	<p>Operational footprint: 36,100m² (190m x 190m)</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	<p>Operational footprint: 36,100m² (190m x 190m)</p> <p>Substation operational access road: 12,800m² (1,600m x 8m)</p>	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m ² (325m x 140m)	National Grid operational substation: 45,500m ² (325m x 140m)	<p>The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).</p> <p>Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in Figure 6.6 of Chapter 6 Project Description.</p>
Decommissioning			
<p>No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left <i>in situ</i>. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.</p>			

22.3 Cumulative Impact Assessment During Construction

12. The following sections discuss which of the two construction scenarios detailed in **section 1** will be the realistic worst case in terms of impacts to onshore ecology.

22.3.1 Impact 1: Impacts on Designated Sites

13. The assessed mitigated impacts (negligible or above) for the proposed East Anglia TWO project alone are:
- Landfall construction – Sandlings Special Protection Area (SPA) - indirect impacts to qualifying bird species. Negligible magnitude. **Minor adverse** significance.
 - Onshore cable corridor construction - Sandlings SPA - direct temporary loss of habitat and disturbance effects. Negligible magnitude. **Minor adverse** significance.
14. Under both Scenario 1 and Scenario 2 at the landfall construction works would be no closer to Sandlings SPA than for proposed East Anglia TWO project alone. As such the potential for disturbance effects will not increase and the cumulative magnitude of effect will remain negligible, representing a **minor adverse** significance under both Scenarios.
15. Under Scenario 1 and Scenario 2 for the cable corridor works the total area of habitat subject to temporary habitat loss (assuming a similar level of mitigation is committed to for both projects) would double from 0.483ha to 0.966ha, however, the nearest nesting sites would remain approximately 300m away (negligible effect). The doubling works footprint represents an increase from 0.014% to 0.028% of total area of the SPA temporarily affected. However, given that the same mitigation measures outlined for the proposed East Anglia TWO project alone are the same for the proposed East Anglia ONE North project, the magnitude of the residual effect would remain negligible, representing a residual cumulative impact of **minor adverse** significance related to direct and indirect impacts to Sandlings SPA.

22.3.2 Impact 2: Impacts to Arable Habitats

16. The assessed mitigated impacts (negligible or above) for East Anglia TWO alone are:
- Indicative onshore development area – temporary and permanent loss of arable habitat. Negligible magnitude. **Negligible** significance.

17. Under Scenario 1 the total area of arable habitat potentially affected could double from 87ha to 177ha. Cumulative impacts would be temporary and reversible (due to reinstatement upon completion of construction) and, given the extent of arable land in the surrounding area it is considered that doubling of the area affected remains an effect of negligible magnitude, representing a cumulative impact of **negligible** significance.
18. Under Scenario 2 the second project would double the area of arable habitat affected as described under Scenario 1. The temporal effect of two separate construction exercises, four years apart, would not represent a greater magnitude of effect compared to Scenario 1. Given the low importance of this feature it is not considered that an overlap of construction footprints would represent a greater magnitude of effect. As such any potential cumulative impact remains no greater than for Scenario 1, i.e. a cumulative impact of **negligible** significance.

22.3.3 Impact 3: Impacts to Grassland Habitats

19. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
 - Indicative onshore development area – temporary and permanent loss of improved and semi-improved grassland habitat. Negligible magnitude. **Negligible** significance.
20. The assessment for proposed East Anglia TWO project East Anglia TWO alone assumes that all the improved grassland (22.3ha) and all the semi-improved grassland habitat (22.9ha) within the indicative onshore development area could be temporarily impacted by the construction of a single project (with a footprint of 87.2ha) as the worst case scenario. The addition of the proposed East Anglia ONE North project cannot increase the total area of grassland within the indicative onshore development area therefore the project alone worst case cannot be exceeded. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone under either Scenario 1 or Scenario 2, i.e. an impact of **negligible** significance.

22.3.4 Impact 4: Impacts to Woodland and Trees

21. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
 - Indicative onshore development area – unavoidable loss of broadleaved woodland. Low magnitude. **Minor adverse** significance.

22. Under Scenario 1 the total area of broadleaved woodland that would be unavoidably lost would increase from approximately 1ha to approximately 2ha. Cumulative impacts would be temporary and reversible (due to replacement of trees upon completion of construction) and, given the extent of similar habitat in the surrounding area it is considered that doubling of the area of woodland affected remains an effect of low magnitude, representing a cumulative impact of **minor adverse** significance.
23. Under Scenario 2 the second project would double the area of woodland affected as described under Scenario 1. However, there are not predicted to be any temporal cumulative effects (even in the case of overlapping footprints) as trees could not be lost twice. As such, cumulative impacts can be no worse than those reported for either Scenario 1, i.e. cumulative impact of **minor adverse** significance.

22.3.5 Impact 5: Impacts to Hedgerows

24. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
- Indicative onshore development area – temporary loss of hedgerow. Negligible magnitude. Minor adverse significance.
25. The assessment for proposed East Anglia TWO project alone assumes that the majority of hedgerows within the indicative onshore development area could be temporarily impacted by the construction of the proposed East Anglia TWO as the worst case scenario. The addition of the proposed East Anglia ONE North project cannot increase the total length of hedgerow within the indicative onshore development area and therefore the project alone worst case cannot be exceeded. As such, cumulative impacts can be no worse than those reported for proposed East Anglia TWO project alone under either Scenario 1 or Scenario 2, i.e. an impact of **minor adverse** significance.

22.3.6 Impact 6: Impacts to Coastal Habitats

26. No impacts were identified for proposed East Anglia TWO project alone, therefore there is no mechanism for a cumulative impact.

22.3.7 Impact 7: Impacts to Watercourses and Ponds

27. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
- Indicative onshore development area – disturbance to watercourses at cable crossings. Negligible magnitude. **Minor adverse** significance.

28. Under Scenario 1, whilst the footprint of the works will increase to accommodate two construction footprints, the magnitude of effect on any given watercourse would remain negligible. It is assumed that temporary dams and culverts would remain in place for the same amount of time for proposed East Anglia TWO and proposed East Anglia ONE North projects as they would for the proposed East Anglia TWO project alone. As such, any cumulative impacts would be no greater than those described for the proposed East Anglia TWO project alone, i.e. minor adverse significance.
29. Under Scenario 2, the temporary dams and culvert will be removed following construction of the proposed East Anglia TWO project, and the channel will be reinstated. A new set of temporary dams and a temporary culvert will then be installed in a similar location as part of the proposed East Anglia ONE North project. This is likely to occur several years after the initial period of disturbance, and the river and its associated habitats could either be still recovering or may have only recently recovered. As a result, the magnitude of the effect resulting from the proposed East Anglia TWO and proposed East Anglia ONE North projects being constructed in succession has the potential to increase. However, the lack of geomorphological diversity observed in the system suggests that any impacts are likely to be highly localised and of negligible magnitude. The residual cumulative impact is therefore considered to remain as **minor adverse** significance.

22.3.8 Impact 8: Badgers

30. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
- Indicative onshore development area – Disturbance to badgers and foraging habitat. Low magnitude. **Minor adverse** significance.
31. The assessment for the proposed East Anglia TWO project alone assumes that all the active and disused badger setts within the onshore development area may need to be destroyed.
32. Under Scenario 1 the addition of the proposed East Anglia ONE North project cannot increase the total number of badger setts present within the indicative onshore development area. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone, i.e. an impact of **minor adverse** significance.
33. Under Scenario 2, following the completion of construction works badgers may return to the indicative onshore development area and create new setts. The proposed East Anglia ONE North project will then require these setts to be

destroyed. On this basis, there is a risk that the same badger populations may be disturbed twice. This has the potential to increase the originally mitigated magnitude of effect from low to medium on a low importance receptor. This represents a cumulative residual impact of **minor adverse** significance. No additional mitigation is proposed beyond those identified for the proposed East Anglia TWO and proposed East Anglia ONE North projects in isolation.

22.3.9 Impact 9: Bats

34. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
- Indicative onshore development area – disturbance to roosting, commuting or foraging bats. Low magnitude. **Moderate adverse** significance. Surveys are still underway and this is based on worst case assumptions.
35. Under Scenario 1 the addition of the proposed East Anglia TWO project cannot increase the total number of these features present within the indicative onshore development area. As such, cumulative impacts can be no worse than those reported for proposed East Anglia TWO project alone, i.e. an impact of **moderate adverse** significance.
36. Under Scenario 2, lost trees and hedgerows within the proposed East Anglia TWO project construction footprint will have been replaced and bat commuting and foraging routes re-established based on four years of growth. The proposed East Anglia ONE North project will then require the removal of an equivalent length of hedgerows and trees adjacent to those removed for the proposed East Anglia TWO project. This is likely to occur several years after the initial period of disturbance, and the habitats could either be still recovering or may have only recently recovered. As a result, the magnitude of the effect resulting from the proposed East Anglia TWO and proposed East Anglia ONE North projects being constructed in succession has the potential to increase overall disturbance effects. However, with the implementation of the same set of mitigation measures any cumulative effect related to the disturbance of bats is considered to be an effect of low magnitude. The residual cumulative impact is therefore considered to remain as **moderate adverse** significance.

22.3.10 Impact 10: Great Crested Newts

37. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Indicative onshore development area – construction presence within 250m of great crested newt ponds. Negligible magnitude. **Minor adverse** significance.
38. The assessment for the proposed East Anglia TWO project alone assumes that whilst all ponds will be avoided, all the terrestrial habitat within 250m of ponds supporting great crested newts may have a construction presence.
39. Under Scenario 1 the addition of the proposed East Anglia ONE North project cannot increase the total area of potential terrestrial habitat for great crested newts within the indicative onshore development area. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone, i.e. an impact of **minor adverse** significance.
40. Under Scenario 2, great crested newts may have required relocation and any disturbed terrestrial habitat will have been reinstated following the completion of the proposed East Anglia TWO project alone. The proposed East Anglia ONE North project will then require the removal an equivalent area of terrestrial habitat adjacent to that removed for the proposed East Anglia TWO project and potentially a second translocation exercise for great crested newts. On this basis, there is a risk that the same great crested newt populations may be disturbed twice. This has the potential to increase the originally mitigated magnitude of effect from negligible to low; increasing the potential cumulative impact to great crested newt populations from minor to **moderate adverse** significance.
41. In the event that the onshore cable corridors of the proposed East Anglia TWO and proposed East Anglia ONE North projects are present within 250m of ponds known to support great crested newts under Scenario 2 additional mitigation measures would be required. Mitigation measures will be identified once detailed design is completed and the exact nature of impacts is known, but could include habitat enhancement at the receptor sites and habitat manipulation within the construction footprint to reduce the risk of great crested newts re-entering the affected areas between the two project construction phases.
42. Following the implementation of agreed additional mitigation measures the magnitude of effect is expected to reduce from low back down to negligible, representing a temporary residual cumulative impact of **minor adverse** significance.

22.3.11 Impact 11: Reptiles

43. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
- Indicative onshore development area – Disturbance to reptile habitat. Low magnitude. **Minor adverse** significance.
44. The assessment for the proposed East Anglia TWO project alone assumes that all the suitable reptile habitat within the indicative onshore development area may be impacted during the construction works.
45. Under Scenario 1 the addition of the proposed East Anglia ONE North project cannot increase the total area of suitable reptile habitat present within the indicative onshore development area. As such, cumulative impacts can be no worse than those reported for the proposed East Anglia TWO project alone, i.e. an impact of **minor adverse** significance.
46. Under Scenario 2, following the completion of construction works any suitable reptile habitat that was removed would be reinstated and in time any reptiles present may return to the area. The proposed East Anglia ONE North project may require the removal of an equivalent area of suitable reptile habitat adjacent to the proposed East Anglia TWO project. This is likely to occur several years after the initial period of disturbance, and the habitats could either be still recovering or may have only recently recovered. However, given that there is very little suitable reptile habitat within the onshore development area, the total area affected is relatively small and the magnitude of effect would remain unchanged (low) and any cumulative impact would be of **minor adverse** significance.

22.3.12 Impact 12: Invasive Non-Native Species

47. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:
- Indicative onshore development area – risk of spreading Himalayan balsam present at the Hundred River. Negligible magnitude. **Minor adverse** significance.
48. The mitigation measures identified for the proposed East Anglia TWO project alone based on good site practice remain sufficient to mitigate this risk under either Scenario 1 or Scenario 2, i.e. any cumulative impacts remain of **minor adverse** significance.

22.4 Cumulative Impacts during Operation

49. Operational impacts on onshore ecology will be the same irrespective of the construction scenario.

22.4.1 Impact 1: Disturbance Effects Associated with Maintenance Activities

50. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore substation and National Grid infrastructure – disturbance effects related to human presence. Negligible magnitude. **Minor adverse** significance.

51. Whilst the frequency of potential maintenance visits would be expected to double, this would be an increase from one visit per week requiring a single vehicle, to two visits per week. The magnitude of effect would remain negligible, representing an impact of **minor adverse** significance.

22.4.2 Impact 2: Disturbance to Fauna from Operational Lighting and Noise

52. The assessed mitigated impacts (negligible or above) for proposed East Anglia TWO project alone are:

- Onshore substation – disturbance effects related to noise and lighting. Negligible magnitude. **Minor adverse** significance.

53. Whilst the frequency of potential maintenance visits would be expected to double, this would only represent an increase from one visit per week to two visits per week, and the magnitude of this effect would remain negligible. In addition, the cumulative operational noise threshold of both the proposed East Anglia TWO and East Anglia ONE North projects will be no greater than for East Anglia TWO alone, and the magnitude of this effect would remain negligible. Overall any cumulative impacts remain unchanged from the proposed East Anglia TWO project alone, i.e. **minor adverse** significance.

22.5 Summary

54. **Table A22.3** gives an overarching summary of which of the two construction scenarios, detailed above, will be the realistic worst case in terms of impacts relating to onshore ecology.

Table A22.3 Summary of Scenario 1 and Scenario 2 Realistic Worst Case Assumptions

Impact	Worst Case	Notes
Impacts to designated sites	N/A	Under both scenarios, nesting sites remain approximately 300m away from the project area, leading to minor adverse significance.
Impacts to arable habitats	N/A	Under both scenarios, the area of land disturbed doubles, and neither represents a greater effect than the other.
Impacts to grassland habitats	N/A	Under either scenario, the addition of a second project will not increase the total area of grassland within the onshore development area, and the same area of grassland would not be disturbed twice.
Impacts to woodland and trees	N/A	No temporal cumulative effects associated with a second construction phase under Scenario 2 as the two projects will not share a construction footprint.
Impacts to hedgerows	N/A	Cumulative impacts can be no worse than those reported for East Anglia TWO alone under either Scenario 1 or Scenario 2.
Impacts to coastal habitats	N/A	No mechanism for a cumulative impact as no impacts identified.
Impacts to watercourses and ponds	Scenario 2	Second disturbance to watercourses associated with Scenario 2 may occur when the river and its associated habitats are still recovering.
Impacts to badgers	Scenario 2	The same badger populations may be disturbed twice under Scenario 2, potentially increasing the magnitude of effect.
Impacts to bats	Scenario 2	The same habitats suitable for bats will be disturbed in succession, potentially whilst still recovering, therefore Scenario 2 is deemed the worst case.
Impacts to great crested newts	Scenario 2	Disturbed terrestrial habitat will have been reinstated following completion of East Anglia TWO. East Anglia ONE North may then require a second translocation exercise, increasing mitigated impacts.
Impacts relating to reptiles	N/A	Magnitude of effect remains unchanged depending on scenario as area affected will remain unchanged as little suitable reptile habitat.
Impacts relating to invasive non-native species	N/A	Mitigation measures mean that impacts under both scenarios remain the same.

55. Overall, construction Scenario 2 creates a realistic worst case in terms of impacts to onshore ecology. Therefore, Scenario 2 will be carried through into

the wider CIA with other developments, see **section 22.7** in **Chapter 22 Onshore Ecology**