

East Anglia ONE North Offshore Windfarm

Appendix 12.3 Supplementary Information for the Cumulative Assessment

Environmental Statement Volume 3

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Glossary of Acronyms

| | |
|-------|--|
| CRM | Collision Risk Modelling |
| EOWDC | European Offshore Wind Development Centre |
| ERM | Environmental Resources Management |
| ES | Environmental Statement |
| GGOWF | Greater Gabbard Offshore Wind Farm |
| NE | Natural England |
| NV | Norfolk Vanguard |
| PEIR | Preliminary Environmental Information Report |
| UK | United Kingdom |

Glossary of Terminology

| | |
|---|--|
| Applicant | East Anglia TWO Limited |
| East Anglia ONE North project | The proposed project consisting of up to 67 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 National Grid infrastructure. |
| East Anglia ONE North windfarm site | The offshore area within which wind turbines and offshore platforms will be located. |
| Evidence Plan Process (EPP) | A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA and Appropriate Assessment. |
| Horizontal directional drilling (HDD) | A method of cable installation where the cable is drilled beneath a feature without the need for trenching. |
| Inter-array cables | Offshore cables which link the wind turbines to each other and the offshore electrical platforms, this will include fibre optic cables. |
| Landfall | The area (from Mean Low Water Springs) where the offshore export cables would make contact with land and connect to the onshore cables. |
| Meteorological mast | An offshore structure which contains metrological instruments used for wind data acquisition. |
| Marking buoys | Buoys to delineate spatial features / restrictions within the offshore development area. |
| Offshore cable corridor | This is the area which will contain the offshore export cables between offshore electrical platforms and transition bays located at landfall. |
| Offshore development area | The East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs). |
| Offshore electrical platform | A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore. |
| Offshore export cables | The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables. |
| Offshore construction, operation and maintenance platform | A fixed structure required for construction operation and maintenance personnel and activities. |
| Offshore platform | A collective term for the offshore construction operation and maintenance platform and the offshore electrical platforms. |
| Platform link cable | An electrical cable which links one or more offshore platforms, this will include fibre optic cables. |
| Safety zones | A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004. |
| Scour protection | Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water |

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12.3 Supplementary Information for the Cumulative Assessment

12.3.1 Introduction

1. This Appendix provides the background information to support the cumulative impact assessment for **Chapter 12 Offshore Ornithology**.
2. **Sections 12.3.2** and **0** provide the audit trail for the cumulative collision risk and cumulative displacement assessments respectively. Given the complexity of the number of projects in the cumulative assessment and the evolution of project envelopes and assumptions over time it is considered that a full explanation of how the cumulative totals have been derived is required.
3. The tables in **sections 12.3.2** and **0** therefore provide a species by species, impact by impact account of the mortalities attributable to each project considered, together with the source of information for each project. These numbers are described in terms of both season and annual totals (as appropriate).
4. The numbers used in the assessment are the totals provided in the '**TOTALS FOR CIA**' cell. These numbers are either:
 - The consented total as taken from the Environmental Statement (ES) or subsequent submissions to the consenting process (e.g. materials taken from Planning Inspectorate Examination responses) upon which the consent is based; or
 - The consented total as taken from a varied consent such as a non-material change (England) or a varied marine licence (Scotland). Note that for Neart na Gaoithe and Inch Cape, although the original 2014 consents are still theoretically able to be used, these represent options that would in practice never be taken forward as they are based on uneconomic Rochdale Envelopes. In addition, given that these projects are due to commence construction based on the designs within the new consents it is considered appropriate to use the new consent numbers; or
 - For older projects where the original numbers are unclear from the ES (or were not broken down into the required detail) accepted totals used within Planning Inspectorate Examination responses (in particular Natural England 2013) are used.
5. In addition to the '**TOTALS FOR CIA**' the tables also provide a '**THEORETICAL TOTALS**' cell where appropriate. This theoretical total provides context for those projects for which no 'official' information (i.e. not covered by one of the definitions included in the '**TOTALS FOR CIA**') beyond the original consent is available but for which it is clear that the assumptions from the original

assessments have been superseded. Notes are there provided where it is believed that numbers could be reduced but where there is not sufficient agreement on figures to carry through to the '**TOTALS FOR CIA**'. These projects include:

- Projects which have been constructed differently from, but within the worst case assumptions of, the existing consent but for which no revised consent is available (e.g. Triton Knoll which was consented at 288 wind turbines but is only installing 90, no updated ornithological assessment was provided); and
 - Projects where a revised consent is expected but has not been determined (e.g. Seagreen).
6. In these cases, the source for the revised total is provided and the revised figures are presented in parentheses for season and annual totals. These numbers are then used to generate the '**THEORETICAL TOTALS**'.
7. The difference between the '**TOTALS FOR CIA**' and '**THEORETICAL TOTALS**' provides an indication of one of the sources of conservatism and overestimation within the cumulative totals (notwithstanding other sources of overestimation such as nocturnal activity or precautionary avoidance rates).
8. **Table A12.3.1** summarises the projects used in the cumulative assessment, which version of the project is used and whether an alternative number is available and used in the theoretical total.

Table A12.3.1 Projects used in the Cumulative Assessment

| Windfarm | Source of Information and Notes | Theoretical also included |
|-----------------------|--|---------------------------|
| Aberdeen (EOWDC) | Taken from various examination responses | No |
| Beatrice Demonstrator | Taken from various examination responses | No |
| Blyth Demonstration | Taken from various examination responses | No |
| Dudgeon | Based on original consent (168 x 3MW), collision risk modelling (CRM) never officially resubmitted | Yes |
| Galloper | Based on original consent (140 x 3.6MW), CRM never officially resubmitted | Yes |
| Greater Gabbard | Taken from various examination responses | Yes |
| Gunfleet Sands | Taken from various examination responses | No |
| Humber Gateway | Taken from various examination responses | No |

| Windfarm | Source of Information and Notes | Theoretical also included |
|--|---|---|
| Hywind | Based on ES | No |
| Kentish Flats | Taken from various examination responses | Yes |
| Lincs | Taken from various examination responses | No |
| London Array | Taken from various examination responses | No |
| Lynn and Inner Dowsing | Taken from various examination responses | No |
| Race Bank | Taken from various examination responses, based on original consent | Yes |
| Rampion | Taken from various examination responses, including NE based on original envelope | Yes |
| Scroby Sands | Taken from various examination responses | No |
| Sheringham Shoal | Taken from various examination responses, based on original consent | Yes |
| Teesside | Taken from various examination responses | No |
| Thanet | Taken from various examination responses | No |
| Westermost Rough | Taken from various examination responses | No |
| Beatrice | Taken from various examination responses, based on original consent | Yes |
| East Anglia ONE | Based on 150 wind turbine non-material change (NMC) consent | Yes |
| Hornsea Project One | Based on NMC | No |
| Kincardine | Based on ES | No |
| Dogger Bank Creyke Beck Projects A and B | Based on NMC | No |
| Dogger Bank Teesside A and B (now Sofia) | Based on NMC | No |
| East Anglia THREE | Based on NMC | No |
| Seagreen Alpha and Bravo | Taken from various examination responses, based on original consent | Yes (based on Inch Cape 2018 assumptions) |
| Hornsea Project Two | Based on ES | No |
| Inch Cape | Based on 2018 ES | No |

| Windfarm | Source of Information and Notes | Theoretical also included |
|-----------------------|---|---------------------------|
| Moray Firth East | Based on original consent, CRM never officially resubmitted | No |
| Neart na Gaoithe | Based on 2018 ES | No |
| Triton Knoll | Based on original consent, CRM never officially resubmitted | Yes |
| Hornsea Project Three | Based on ES | n/a |
| Moray Firth West | Based on ES | n/a |
| Norfolk Boreas | Based on ES | n/a |
| Norfolk Vanguard | Revised CRM with draft height raised by 5m, scenario of half wind turbines in each of NV East and NV West | n/a |
| Thanet Extension | Based on ES | n/a |
| East Anglia ONE North | ES | n/a |
| East Anglia TWO | ES | n/a |

12.3.2 Cumulative Collision Risk

12.3.3.1 Gannet

Table A12.3.2 Gannet Cumulative Collision Risk

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------------|----------------------|---------------|--------------|---------------|-----------------------|---------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Aberdeen (EOWDC) | 4.2 | 5.1 | 0.1 | 9.4 | (Band, 2012) | 2 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 1 | Beatrice Demonstrator | 0.6 | 0.9 | 0.7 | 2.2 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| 1 | Beatrice | 37.4 | 48.8 | 9.5 | 95.7 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), calculated from (Arcus Consultancy Services, 2013). This was calculated for 277 turbines, but only 84 were installed. Smart Wind (2015) revises their total to 42 collisions, but it is unclear how these calculations were carried out. |
| | | (22.7) | (29.6) | (5.8) | (58.1) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 58.1 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 1 | Blyth Demonstration | 3.5 | 2.1 | 2.8 | 8.4 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 1 | Dudgeon | 22.3 | 38.9 | 19.1 | 80.3 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2013). This was calculated for 168 x 3MW turbines. |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------|----------------------|---------------|--------------|---------------|-----------------------|--------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| | | | | | | | | | The site consists of 67 x 6MW turbines. Smart Wind (2015) revises their total to 36.6 collisions, but it is unclear how these calculations were carried out. |
| | | (10.3) | (18.0) | (8.8) | (37.1) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 37.1 birds per year (Macarthur Green and Royal HaskoningDHV 2019) |
| 1 | Galloper | 18.1 | 30.9 | 12.6 | 61.6 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV 2016), from (Smart Wind 2015a). This was calculated for 140 turbines, but the site actually consists of 56 x 6.3MW turbines. |
| | | (7.8) | (13.4) | (5.5) | (26.7) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 26.7 birds per year (Macarthur Green and Royal HaskoningDHV 2019). |
| 1 | Greater Gabbard | 14 | 8.8 | 4.8 | 27.6 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). These numbers are also in (Forewind, 2014), which appear to have originated from the EA1 examination. There, NE submitted a table quoting a total of 50 birds at 98% avoidance. The EA1 ES chapter (ERM, 2012) says no birds for |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|----------------|----------------------|--------------|--------------|---------------|-----------------------|---------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| | | | | | | | | | GGOWF, which is repeated in the Technical Report (Banks et al., 2006). The method employed appears to be based on a directional model. |
| | | (13.4) | (8.4) | (4.6) | (26.4) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 26.4 birds per year (Macarthur Green and Royal HaskoningDHV 2019). |
| 1 | Gunfleet Sands | 0 | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV 2016), from (Natural England 2013). |
| 1 | Humber Gateway | 1.9 | 1.1 | 1.5 | 4.5 | Unknown | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 1 | Hywind | 5.6 | 0.8 | 0.8 | 7.2 | (Band, 2012) | 1 | 98.9 | (Statoil, 2014). |
| 1 | Kentish Flats | 1.4 | 0.8 | 1.1 | 3.3 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| | | (1.1) | (0.7) | (0.9) | (2.7) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 2.7 birds per year (Macarthur Green and Royal HaskoningDHV 2019). |
| 1 | Lincs | 2.1 | 1.3 | 1.7 | 5.1 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|------------------------|----------------------|---------------|--------------|---------------|-----------------------------------|---------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 1 | London Array | 2.3 | 1.4 | 1.8 | 5.5 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 1 | Lynn and Inner Dowsing | 0.2 | 0.1 | 0.2 | 0.5 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 1 | Race Bank | 33.7 | 11.7 | 4.1 | 49.5 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). This was calculated for 206 turbines, but the site actually consists of 91 x 6MW turbines. |
| | | (18.0) | (6.2) | (2.2) | (26.4) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 26.4 birds per year (Macarthur Green and Royal HaskoningDHV 2019) |
| 1 | Rampion | 36.2 | 63.5 | 2.1 | 101.8 | (Band, 2012) – draft 2011 version | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2013). This was calculated for 175 x 4MW turbines; the site consists of 116 x 3.4MW turbines. |
| | | (25) | (43.9) | (1.5) | (70.4) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 70.4 birds per year (Macarthur Green and Royal HaskoningDHV 2019) |
| 1 | Scroby Sands | 0 | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|---------------------|----------------------|---------------|--------------|---------------|-----------------------|--------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Sheringham Shoal | 14.1 | 3.5 | 0 | 17.6 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). This was originally carried out using a 108 x 3MW turbine layout, compared with the 88 x 3.6MW turbines that were installed. |
| | | (13.2) | (3.3) | (0) | (16.5) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 16.5 birds per year (Macarthur Green and Royal HaskoningDHV 2019) |
| 1 | Teeside | 4.9 | 1.7 | 0 | 6.6 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV 2016), from (Smart Wind 2015a). |
| 1 | Thanet | 1.1 | 0 | 0 | 1.1 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 1 | Westermost Rough | 0.2 | 0.1 | 0.2 | 0.5 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). |
| 2 | East Anglia ONE | 3.4 | 131 | 6.3 | 140.7 | (Band, 2012) | 1 | 98.9 | (Macarthur Green, 2019a). |
| | | (2.3) | (88.9) | (4.3) | (95.5) | (Band, 2012) | 1 | 98.9 | If the 102 wind turbine as in construction is used, annual estimated mortality is 95.5 total. |
| 2 | Hornsea Project One | 5.0 | 14.1 | 9.9 | 29 | (Band, 2012) | 2 | 98.9 | (Hornsea Offshore Wind Farm Project One, 2016) |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|--|----------------------|--------|--------|--------|-----------------------|--------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 2 | Kincardine | 3 | 0 | 0 | 3 | (Band, 2012) | 1 | 98.9 | (Pilot Renewables, 2016). |
| 2 | Moray Firth East | 80.6 | 35.4 | 8.9 | 124.9 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| 3 | Dogger Bank Creyke Beck Projects A and B | 66.7 | 68.7 | 44.7 | 180.1 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2018a). |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 14.8 | 8.8 | 9.4 | 33 | (Band, 2012) | 2 | 98.9 | (Innogy Renewables UK, 2018). For now, this is the consented Teeside A and B total with seasonal numbers based on the proportion of the old numbers in each season. This is due to the lack of availability for revised Teeside A numbers. Only small reductions in total anticipated. |
| 3 | East Anglia THREE | 5.7 | 31.1 | 9.0 | 45.8 | (Band, 2012) | 1 | 98.9 | (Macarthur Green, 2019b) |
| 3 | Hornsea Project Two | 7 | 14 | 6 | 27 | (Band, 2012) | 2 | 98.9 | (Smart Wind, 2015b). |
| 3 | Inch Cape | 46 | 1 | 1 | 48 | (Band, 2012) | 1 | 98.9 | (Inch Cape Offshore, 2018). |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|----------------------------------|--|--|--|---------------------------------------|-----------------------|---------|----------------|---|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 3 | Moray Firth West | 10 | 2 | 1 | 13 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 3 | Neart na Gaoithe | 93 | 7 | 7 | 107 | (Band, 2012) | 2 | 98.9 | (GoBe Consultants, 2018). |
| 3 | Triton Knoll | 26.8 | 64.1 | 30.1 | 121 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015a). This was calculated for 288 turbines. The site will consist of 90 turbines. |
| | | (9.4) | (22.5) | (10.5) | (42.4) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 42.4 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 4 | Forth (Seagreen) Alpha and Bravo | 800.8 | 49.3 | 65.8 | 915.9 | (Band, 2012) | 3 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| | | Alpha (278) Bravo (175) | Alpha (11) Bravo (13) | Alpha (12) Bravo (13) | Seagreen Alpha and Bravo (502) | (Band, 2012) | 2 | 98.9 | At the moment, there is nothing in the public domain from Seagreen. Recalculated figures from (Inch Cape Offshore (2018). |
| 4 | Hornsea Project Three | 18 | 12 | 8 | 38 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |

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| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|----------------------------------|-----------------------|----------------------|---------------------|---------------------|----------------------|---|---------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 4 | Norfolk Boreas | 54.13 | 48.5 | 14.99 | 117.62 | (Band, 2012) | 2 | 98.9 | (Royal HaskoningDHV, 2018b). |
| 4 | Norfolk Vanguard | 16.97 | 38.44 | 10.89 | 66.3 | (Band, 2012) | 2 | 98.9 | (Norfolk Vanguard 2019b). Revised CRM with draft height raised by 5m, scenario of half WTGs in each of NV East and NV West |
| 4 | Thanet Extension | 0 | 11.1 | 22.9 | 34 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 4 | East Anglia TWO | 12.66 | 28.74 | 5.6 | 47.02 | (Band, 2012) | 2 | 98.9 | (Scottish Power Renewables, 2019a). |
| 4 | East Anglia ONE North | 11.02 | 12.85 | 3.4 | 27.27 | (Band, 2012) | 2 | 98.9 | (Scottish Power Renewables 2019b) |
| TOTALS FOR CIA | | 1479.4 | 799.6 | 328.0 | 2607.0 | TOTALS FOR CIA are the numbers used in the CIA, <i>THEORETICAL TOTALS</i> show the reductions if as-built/ as planned (but not consented) numbers are used | | | |
| <i>THEORETICAL TOTALS</i> | | <i>1047.4</i> | <i>607.2</i> | <i>241.6</i> | <i>1896.1</i> | | | | |

12.3.3.2 Kittiwake

Table A12.3.3 Kittiwake Cumulative Collision Risk

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------------|----------------------|--------|--------|--------|-----------------------|--------|----------------|---|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Aberdeen (EOWDC) | 11.8 | 5.8 | 1.1 | 18.7 | (Band, 2012) | 2 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015) |
| 1 | Beatrice Demonstrator | 1.15 | 2.1 | 1.7 | 4.95 | (Band, 2000) | 1 | 99.2 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | Beatrice | 37.66 | 4.3 | 15.9 | 57.86 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). This figure is taken directly from NE's Hornsea Project Two document. Based on the previous value (circa 145 from original ES), it seems that this has been corrected to account for the reduction in turbines (277 to 84). |
| 1 | Blyth Demonstration | 1.69 | 2.3 | 1.4 | 5.39 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), based on data from (Natural England, 2015). |
| 1 | Dudgeon | 0 | 0 | 0 | 0 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | Galloper | 6.29 | 27.8 | 31.8 | 65.89 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). This was calculated for 140 turbines, but the site |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------|----------------------|---------------|---------------|---------------|-----------------------|---------|----------------|---|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| | | | | | | | | | actually consists of 56 x 6.3MW turbines. |
| | | (2.1) | (9.2) | (10.5) | (21.7) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 21.7 birds per year (Macarthur Green and Royal HaskoningDHV, 2019).. |
| 1 | Greater Gabbard | 1.1 | 15 | 11.4 | 27.5 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). The exact origin of this number is unknown |
| | | (0.8) | (11.1) | (8.5) | (20.4) | (Band, 2012) | 1 | 98.9 | Recently been recalculated at 20.4 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |
| 1 | Gunfleet Sands | 0 | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| 1 | Humber Gateway | 2.55 | 3.19 | 1.9 | 7.64 | Unknown | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | Hywind | 16.6 | 0.85 | 0.85 | 18.3 | (Band, 2012) | 1 | 98.9 | (Statoil, 2014). |
| 1 | Kentish Flats | 0.6 | 0.9 | 0.7 | 2.2 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |

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| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|------------------------|----------------------|---------------|---------------|---------------|-----------------------------------|---------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Lincs | 0.92 | 1.16 | 0.69 | 2.77 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | London Array | 1.4 | 2.3 | 1.8 | 5.5 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | Lynn and Inner Dowsing | 0 | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| 1 | Race Bank | 1.86 | 23.9 | 5.59 | 31.35 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). This was calculated for 206 turbines, but the site actually consists of 91 x 6MW turbines. |
| | | (0.8) | (10) | (2.3) | (13.1) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 13.1 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |
| 1 | Rampion | 54.4 | 37.4 | 29.7 | 121 | (Band, 2012) – draft 2011 version | 1 | 98.9 | (Royal HaskoningDHV, 2016). This was calculated for 175 x 4MW turbines, but the site consists of 116 x 3.4MW turbines. |
| | | (28.8) | (19.8) | (15.7) | (64.1) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 64.1 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |

East Anglia ONE North Offshore Windfarm

Environmental Statement

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|---------------------|----------------------|--------------|-------------|----------------|-----------------------|---------|----------------|--|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Scroby Sands | 0 | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| 1 | Sheringham Shoal | 0 | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Natural England, 2013). |
| 1 | Teeside | 50.58 | 24 | 2.5 | 77.08 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | Thanet | 0.2 | 0.5 | 0.4 | 1.2 | (Band, 2000) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 1 | Westermost Rough | 0.18 | 0.22 | 0.13 | 0.53 | (Band et al., 2007) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| 2 | East Anglia ONE | 46.7 | 1.5 | 161.0 | 209.2 | (Band, 2012) | 1 | 98.9 | (Macarthur Green, 2019a). |
| | | (24.7) | (0.8) | (85) | (110.5) | (Band, 2012) | 1 | 98.9 | If a 102 turbine (as built) layout is used, mortalities 110.5 total. |
| 2 | Hornsea Project One | 6.9 | 8.1 | 3.0 | 18.0 | (Band, 2012) | 2 | 98.9 | (Hornsea Offshore Wind Farm Project One, 2016). |
| 2 | Kincardine | 22 | 9 | 3 | 34 | (Band, 2012) | 1 | 98.9 | (Pilot Renewables, 2016). |
| 2 | Moray Firth East | 24.1 | 2.0 | 19.3 | 45.4 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |

East Anglia ONE North Offshore Windfarm
Environmental Statement

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|--|--|---|--|---------------------------------------|-----------------------|---------|----------------|---|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 3 | Dogger Bank Creyke Beck Projects A and B | 55.4 | 25.9 | 56.7 | 138 | (Band, 2012) | 3 | 98.9 | (Royal HaskoningDHV, 2018a). |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 88.7 | 67.1 | 202.2 | 358 | (Band, 2012) | 2 | 98.9 | (Innogy Renewables UK, 2018). |
| 3 | East Anglia THREE | 6.1 | 68.4 | 37.2 | 111.6 | (Band, 2012) | 1 | 98.9 | (Macarthur Green, 2019b) |
| 3 | Forth (Seagreen) Alpha and Bravo | 153.2 | 313.5 | 247.8 | 714.45 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). |
| | | Alpha (74) Bravo (80) | Alpha (112) Bravo (62) | Alpha (42) Bravo (45) | Seagreen Alpha and Bravo (415) | (Band, 2012) | 2 | 98.9 | At the moment, there is nothing in the public domain from Seagreen. The recalculated Inch Cape figures (Inch Cape Offshore, 2018). |
| 3 | Hornsea Project Two | 16 | 9 | 3 | 28 | (Band, 2012) | 1 | 98.9 | (Smart Wind, 2015b). |
| 3 | Inch Cape | 40 | 26 | 6 | 72 | (Band, 2012) | 2 | 98.9 | (Inch Cape Offshore, 2018). |
| 3 | Moray Firth West | 79 | 24 | 7 | 110 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------------|----------------------|---------------|---------------|---------------|-----------------------|---------|----------------|---|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 3 | Neart na Gaoithe | 9 | 17 | 2 | 28 | (Band, 2012) | 2 | 98.9 | (GoBe Consultants, 2018). |
| 3 | Triton Knoll | 24.6 | 139 | 45.4 | 209 | (Band, 2012) | 1 | 98.9 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). This was calculated for 288 turbines. The site will consist of 90 turbines. |
| | | (6.8) | (38.5) | (12.6) | (57.9) | (Band, 2012) | 1 | 98.9 | Recently recalculated at 57.9 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 4 | Hornsea Project Three | 165.3 | 61.3 | 11.4 | 238 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 4 | Norfolk Boreas | 29.92 | 116.59 | 56.29 | 202.8 | (Band, 2012) | 2 | 98.9 | (Royal HaskoningDHV, 2018b). |
| 4 | Norfolk Vanguard | 43.81 | 32.93 | 38.66 | 115.4 | (Band 2012) | 2 | 98.9 | (Norfolk Vanguard 2019). Revised CRM with draft height raised by 5m, scenario of half WTGs in each of NV East and NV West |
| 4 | Thanet Extension | 2.3 | 5.3 | 15.3 | 23.0 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 4 | East Anglia TWO | 19.77 | 9.29 | 20.88 | 49.93 | (Band, 2012) | 2 | 98.9 | (Scottish Power Renewables, 2019a). |

| Tier | Windfarm | Number of Collisions | | | | Band Model Parameters | | | Source of Information and Notes |
|---------------------------|-----------------------|----------------------|---------------|--------------|---------------|---|--------|----------------|-----------------------------------|
| | | Breeding | Autumn | Spring | Annual | Iteration | Option | Avoidance Rate | |
| 4 | East Anglia ONE North | 18.65 | 12.05 | 27.31 | 57.99 | (Band, 2012) | 2 | 98.9 | (Scottish Power Renewables 2019b) |
| TOTALS FOR CIA | | 1040.4 | 1099.7 | 1071 | 3210.6 | TOTALS FOR CIA are the numbers used in the CIA, THEORETICAL TOTALS show the reductions if as-built / as planned (but not consented) numbers are used | | | |
| THEORETICAL TOTALS | | 970.3 | 805 | 759.9 | 2534.9 | | | | |

12.3.3.3 Lesser Black-backed Gull

Table A12.3.4 Lesser Black-backed Gull Cumulative Collision Risk

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------------|----------------------|--------------|--------|-----------------------|---------|----------------|--|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Aberdeen (EOWDC) | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 1 | Beatrice Demonstrator | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (E.ON, 2013). |
| 1 | Beatrice | 0 | 0 | 0 | N/A | N/A | N/A | (Arcus Consultancy Services, 2013) |
| 1 | Blyth Demonstration | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------|----------------------|---------------|---------------|-----------------------|---------|----------------|---|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Dudgeon | 7.7 | 30.6 | 38.3 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (E.ON, 2013). This was calculated for 168 x 3MW turbines. The site consists of 67 x 6MW turbines. |
| | | (3.1) | (12.2) | (15.3) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 15.3 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 1 | Galloper | 27.8 | 111.0 | 138.8 | (Band et al., 2007) | 1 | 99.5 | (Royal HaskoningDHV, 2016). This was calculated for 140 turbines, but the site actually consists of 56 x 6.3MW turbines. |
| | | (10.5) | (41.7) | (52.2) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 52.2 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |
| 1 | Greater Gabbard | 12.4 | 49.6 | 62 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (E.ON, 2013; Smart Wind, 2015c). |
| 1 | Gunfleet Sands | 1 | 1 | 2 | Unknown | Unknown | 99 | (Royal HaskoningDHV, 2016), from (E.ON, 2013). |
| 1 | Humber Gateway | 0.3 | 1.1 | 1.3 | Unknown | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | Hywind | 0 | 0 | 0 | N/A | N/A | N/A | (Statoil, 2014). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|------------------------|----------------------|--------------|---------------|-----------------------------------|---------|----------------|--|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Kentish Flats | 0.3 | 1.3 | 1.6 | (Band et al., 2007) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | Lincs | 1.7 | 6.8 | 8.5 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | London Array | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 1 | Lynn and Inner Dowsing | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (E.ON, 2013). |
| 1 | Race Bank | 43.2 | 10.8 | 54.0 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). This was calculated for 206 turbines, but the site actually consists of 91 x 6MW turbines. |
| | | (20.5) | (5.1) | (25.6) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 25.6 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 1 | Rampion | 1.6 | 6.3 | 7.9 | (Band, 2012) – draft 2011 version | 1 | 99.5 | (Royal HaskoningDHV, 2016). This was calculated for 175 x 4MW turbines, but the site consists of 116 x 3.4MW turbines. |
| | | (1.0) | (3.8) | (4.8) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 4.8 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 1 | Scroby Sands | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (E.ON, 2013). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|--|----------------------|---------------|---------------|-----------------------|--------|----------------|---|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Sheringham Shoal | 2 | 6 | 8 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | Teeside | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 1 | Thanet | 3.2 | 12.8 | 16 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | Westermost Rough | 0.1 | 0.3 | 0.3 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 2 | East Anglia ONE | 5.9 | 33.8 | 39.7 | (Band, 2012) | 1 | 99.5 | (Macarthur Green, 2019a). |
| | | (3.6) | (20.7) | (24.3) | (Band, 2012) | 1 | 99.5 | If 102 wind turbine in construction calculation is used, mortalities are 24.3 total. |
| 2 | Hornsea Project One | 4.4 | 17.4 | 21.8 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c) and (Macarthur Green, 2019a). |
| 2 | Kincardine | 0 | 0 | 0 | N/A | N/A | N/A | (Atkins, 2016) |
| 2 | Moray Firth East | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 3 | Dogger Bank Creyke Beck Projects A and B | 2.6 | 10.4 | 13 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). The NMC (Royal HaskoningDHV, 2018a) did not include this species. |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|---|----------------------|--------------|---------------|-----------------------|---------|----------------|---|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 2.4 | 9.6 | 12 | (Band, 2012) | 2 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 3 | East Anglia THREE | 1.6 | 7.4 | 9 | (Band, 2012) | 1 | 99.5 | (Macarthur Green, 2019b) |
| 3 | Forth (Seagreen) Alpha and Bravo | 2.1 | 8.4 | 10.5 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 3 | Hornsea Project Two | 2 | 2 | 4 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 3 | Inch Cape | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 3 | Moray Firth West | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 3 | Near na Gaoithe | 0 | 0 | 0 | (Band, 2012) | 1 | 99.5 | (GoBe Consultants, 2018). |
| 3 | Triton Knoll | 7.4 | 29.6 | 37 | (Band, 2012) | 1 | 99.5 | (Macarthur Green, 2019a). |
| | | (2.3) | (9.3) | (11.6) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 11.6 birds per year (Option 1, 99.5% avoidance) (Macarthur Green and Royal HaskoningDHV, 2019). Proportionally, this is 2.3 breeding and 9.3 non-breeding. |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|----------------------------------|-----------------------|----------------------|---------------------|---------------------|--|---------|----------------|-------------------------------------|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 4 | Hornsea Project Three | 17.3 | 0 | 17.3 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 4 | Norfolk Boreas | 8.02 | 31.76 | 39.78 | (Band, 2012) | 2 | 99.5 | (Royal HaskoningDHV, 2018b). |
| 4 | Norfolk Vanguard | 15.57 | 7.47 | 23.05 | (Band, 2012) | 2 | 99.5 | (Norfolk Vanguard Ltd, 2019b) |
| 4 | Thanet Extension | 1.5 | 0.8 | 2.3 | Unknown | Unknown | Unknown | (Macarthur Green, 2019a). |
| 4 | East Anglia TWO | 4.72 | 0.46 | 5.18 | (Band, 2012) | 2 | 99.5 | (Scottish Power Renewables, 2019a). |
| 4 | East Anglia ONE North | 0.95 | 0.63 | 1.56 | (Band, 2012) | 2 | 99.5 | (Scottish Power Renewables, 2019b) |
| TOTALS FOR CIA | | 177.8 | 397.3 | 574.9 | TOTALS FOR CIA are the numbers used in the CIA, <i>THEORETICAL TOTALS</i> show the reductions if as-built / as planned (but not consented) numbers are used | | | |
| <i>THEORETICAL TOTALS</i> | | <i>138.8</i> | <i>271.0</i> | <i>409.5</i> | | | | |

12.3.3.4 Great Black-backed Gull

Table A12.3.5 Great Black-backed Gull Cumulative Collision Risk

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------------|----------------------|----------------|----------------|-----------------------|--------|----------------|--|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Aberdeen (EOWDC) | 0.6 | 0.4 | 1.0 | (Band, 2012) | 2 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | Beatrice Demonstrator | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 1 | Beatrice | 30.2 | 120.8 | 151 | (Band et al., 2007) | 1 | 99.5 | (Arcus Consultancy Services, 2013) |
| | | (26.1) | (104.5) | (130.6) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 130.6 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |
| 1 | Blyth Demonstration | 1.3 | 5.1 | 6.3 | (Band et al., 2007) | 1 | 99.5 | (Royal HaskoningDHV, 2016). |
| 1 | Dudgeon | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 1 | Gallopier | 4.5 | 18 | 22.5 | (Band et al., 2007) | 1 | 99.5 | (Royal HaskoningDHV, 2016). This was calculated for 140 turbines, but the site actually consists of 56 x 6.3MW turbines. |
| | | (1.8) | (7.2) | (9.0) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 9.0 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|-----------------|----------------------|---------------|---------------|-----------------------|---------|----------------|--|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Greater Gabbard | 15.0 | 60.0 | 75.0 | (Band, 2000) | 1 | 99.82 | (Royal HaskoningDHV, 2016), from (Banks et al., 2006), verified by (Macarthur Green and Royal HaskoningDHV, 2019). |
| | | (13.4) | (53.5) | (66.9) | (Band, 2012) | 1 | 99.5 | Recently been recalculated at 66.9 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |
| 1 | Gunfleet Sands | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Smart Wind, 2014). |
| 1 | Humber Gateway | 1.3 | 5.1 | 6.3 | Unknown | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2014). |
| | | (0.6) | (2.3) | (2.9) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 2.9 birds per year ((Macarthur Green and Royal HaskoningDHV, 2019). |
| 1 | Hywind | 0.3 | 4.5 | 4.8 | (Band, 2012) | 1 | 99.5 | (Statoil, 2014). |
| 1 | Kentish Flats | 0.1 | 0.2 | 0.3 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Smart Wind, 2014). |
| 1 | Lincs | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Smart Wind, 2014). |

East Anglia ONE North Offshore Windfarm

Environmental Statement

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|------------------------|----------------------|---------------|---------------|-----------------------------------|---------|----------------|--|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | London Array | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016), from (Smart Wind, 2014). |
| 1 | Lynn and Inner Dowsing | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016). |
| 1 | Race Bank | 0 | 0 | 0 | N/A | N/A | N/A | (Royal HaskoningDHV, 2016). |
| 1 | Rampion | 5.2 | 20.8 | 26.0 | (Band, 2012) – draft 2011 version | 1 | 99.5 | (Royal HaskoningDHV, 2016). This was calculated for 175 x 4MW turbines, but the site consists of 116 x 3.4MW turbines. |
| | | (3.3) | (13.4) | (16.7) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 16.7 birds per year (Macarthur Green and Royal HaskoningDHV, 2019) |
| 1 | Scroby Sands | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016). |
| 1 | Sheringham Shoal | 0 | 0 | 0 | Unknown | Unknown | Unknown | (Royal HaskoningDHV, 2016). |
| 1 | Teeside | 8.7 | 34.8 | 43.6 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| | | (5.5) | (22.0) | (27.6) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 27.6 birds per year (Option 1, 99.5% avoidance) (Macarthur Green and Royal HaskoningDHV, 2019). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|--|----------------------|--------------|--------|-----------------------|--------|----------------|---|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 1 | Thanet | 0.1 | 0.4 | 0.5 | (Band, 2000) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 1 | Westermost Rough | 0 | 0 | 0.1 | (Band et al., 2007) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2014). |
| 2 | East Anglia ONE | 0.5 | 31.5 | 32.0 | (Band, 2012) | 1 | 99.5 | (Macarthur Green, 2016). Seasonal proportions calculated from (Royal HaskoningDHV, 2016). |
| 2 | Hornsea Project One | 17.2 | 68.6 | 85.8 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), based on data from (Natural England, 2015). This was calculated for 332 turbines. The site will consist of 174 turbines once construction is finished (scheduled to be late summer 2019). |
| 2 | Kincardine | 0 | 0 | 0 | N/A | N/A | N/A | (Atkins, 2016). |
| 2 | Moray Firth East | 9.5 | 25.5 | 35.0 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 3 | Dogger Bank Creyke Beck Projects A and B | 5.8 | 23.3 | 29.1 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c). |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 11 | 26 | 37 | (Band, 2012) | 2 | 99.5 | (Smart Wind, 2015c). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|------|----------------------------------|----------------------|---------------|---------------|-----------------------|--------|----------------|---|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 3 | East Anglia THREE | 4.3 | 32.1 | 36.4 | (Band, 2012) | 1 | 99.5 | (Macarthur Green, 2019b) |
| 3 | Forth (Seagreen) Alpha and Bravo | 13.4 | 53.4 | 66.8 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016). |
| 3 | Hornsea Project Two | 3 | 20 | 23 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c) and (Macarthur Green and Royal HaskoningDHV, 2019). |
| 3 | Inch Cape | 0 | 36.8 | 36.8 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Smart Wind, 2015c) and (Macarthur Green and Royal HaskoningDHV, 2019). |
| 3 | Moray Firth West | 4 | 5 | 9 | (Band, 2012) | 2 | 99.5 | (Moray Offshore Windfarm (West), 2018). |
| 3 | Near na Gaoithe | 0 | 3 | 3 | (Band, 2012) | 2 | 99.5 | (GoBe Consultants, 2018). |
| 3 | Triton Knoll | 24.4 | 97.6 | 122.0 | (Band, 2012) | 1 | 99.5 | (Royal HaskoningDHV, 2016), from (Natural England, 2015). This was calculated for 288 turbines. The site will consist of 90 turbines. |
| | | (8.0) | (32.1) | (40.1) | (Band, 2012) | 1 | 99.5 | Recently recalculated at 40.1 birds per year (Macarthur Green and Royal HaskoningDHV, 2019). |
| 4 | Hornsea Project Three | 7 | 25 | 32 | (Band, 2012) | 2 | 99.5 | (NIRAS Consulting, 2019), (Macarthur Green and Royal HaskoningDHV, 2019). |

| Tier | Windfarm | Number of Collisions | | | Band Model Parameters | | | Source of Information and Notes |
|----------------------------------|-----------------------|----------------------|---------------------|---------------------|---|--------|----------------|--|
| | | Breeding | Non-breeding | Annual | Iteration | Option | Avoidance Rate | |
| 4 | Norfolk Boreas | 7.75 | 85.35 | 93.11 | (Band, 2012) | 2 | 99.5 | (Royal HaskoningDHV, 2018b). |
| 4 | Norfolk Vanguard | 8.09 | 39.25 | 46.84 | (Band, 2012) | 2 | 99.5 | (Norfolk Vanguard Ltd 2019b) |
| 4 | Thanet Extension | 2 | 20 | 22 | (Band, 2012) | 2 | 99.5 | (APEM, 2018; Macarthur Green and Royal HaskoningDHV, 2019) |
| 4 | East Anglia TWO | 3.84 | 3.73 | 7.56 | (Band, 2012) | 2 | 99.5 | (Scottish Power Renewables, 2019a). |
| 4 | East Anglia ONE North | 3.92 | 1.28 | 5.2 | (Band, 2012) | 2 | 99.5 | (Scottish Power Renewables, 2019b) |
| TOTALS FOR CIA | | 193.0 | 867.5 | 1060.0 | TOTALS FOR CIA are the numbers used in the CIA, THEORETICAL TOTALS show the reductions if as-built / as planned (but not consented) numbers are used | | | |
| <i>THEORETICAL TOTALS</i> | | <i>154.5</i> | <i>713.9</i> | <i>868.0</i> | | | | |

12.3.3 Cumulative Displacement Risk

12.3.3.1 Red-throated Diver

12.3.3.1.1 Standard Assessment

9. **Table A12.3.6** below summarises the red-throated diver assessments that have been carried out for offshore wind farms in the Southern North Sea BDMPS area (Furness 2015). The information is taken from Norfolk Boreas Ltd (2019) and excludes former East Anglia Zone windfarms.

Table A12.3.6 Red-throated Diver Assessments in the Southern North Sea

| Windfarm | Red-throated diver assessment method | Estimated no. of red-throated diver mortalities due to displacement | Source |
|-------------------------|--------------------------------------|---|-------------------------|
| Scroby Sands | None | No number presented | Norfolk Boreas Ltd 2019 |
| Kentish Flats | Qualitative | No number presented | Norfolk Boreas Ltd 2019 |
| Lynn & Inner Dowsing | Qualitative | No number presented | Norfolk Boreas Ltd 2019 |
| Gunfleet Sands | Qualitative | very small' | Norfolk Boreas Ltd 2019 |
| Thanet | Quantitative | <1-2 | Norfolk Boreas Ltd 2019 |
| Sheringham Shoal | None | No number presented | Norfolk Boreas Ltd 2019 |
| Greater Gabbard | Quantitative | 4-40 | Norfolk Boreas Ltd 2019 |
| London Array | Qualitative | No number presented | Norfolk Boreas Ltd 2019 |
| Lincs | Qualitative | No number presented | Norfolk Boreas Ltd 2019 |
| Kentish Flats Extension | Qualitative | No number presented | Norfolk Boreas Ltd 2019 |
| Galloper | Quantitative | 1-14 | Norfolk Boreas Ltd 2019 |
| Dudgeon | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Race Bank | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |

| Windfarm | Red-throated diver assessment method | Estimated no. of red-throated diver mortalities due to displacement | Source |
|--------------------------------|--------------------------------------|---|-------------------------|
| Triton Knoll | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Thanet Extension | Quantitative | 1-9 | Norfolk Boreas Ltd 2019 |
| Dogger Bank Creyke Beck A & B | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Dogger Bank Teesside A / Sofia | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Blyth Demonstrator | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Teesside | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Westermost Rough | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Humber Gateway | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Hornsea Project 1 | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Hornsea Project 2 | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |
| Hornsea Project 3 | Not assessed | No number presented | Norfolk Boreas Ltd 2019 |

10. **Table A12.3.7** below presents estimated cumulative displacement mortality of red-throated divers at offshore wind farms within the Southern North Sea BDMPS region (Furness 2015), on the bases of the precautionary assumption of 90-100% displacement within the wind farm and 4km buffer and 1-10% mortality of displaced individuals.

Table A12.3.7 Estimated Cumulative Displacement Risk of Red-Throated Divers At Offshore Wind Farms within the Southern North Sea BDMPS Region

| Windfarm | Number of birds at risk of displacement mortality (wind farms and 4km buffers) | | | | Source of Information |
|---|--|-------------------|-------------------|-----------------|---------------------------------|
| | Autumn Migration | Winter | Spring Migration | Annual | |
| Wider region projects (see table above) | N/A | N/A | N/A | 6 – 56 | Norfolk Boreas Ltd 2019 |
| Thanet Extension | 0 | 4 - 43 | 2 – 26 | 6 - 69 | Norfolk Boreas Ltd 2019 |
| East Anglia ONE | 0.4 - 5 | 1 - 10 | 1.4 - 15 | 2.8 - 30 | Norfolk Boreas Ltd 2019 |
| East Anglia THREE | 0.4 - 5 | 0.2 – 2 | 2 - 20 | 2.6 - 27 | Norfolk Boreas Ltd 2019 |
| Norfolk Vanguard East | 0.4 - 5 | 0.2 - 3 | 1 - 12 | 1.6 - 20 | Norfolk Boreas Ltd 2019 |
| Norfolk Vanguard West | 0 – 3 | 3 - 36 | 2 – 20 | 5 – 59 | Norfolk Boreas Ltd 2019 |
| Norfolk Boreas | 0 - 1 | 1 - 15 | 5 - 62 | 6 – 78 | Norfolk Boreas Ltd 2019 |
| East Anglia TWO | 0 | 0 - 2 | 2 - 25 | 3 - 28 | Scottish Power Renewables 2019a |
| East Anglia ONE North | 0 - 1 | 1 - 7 | 3 - 34 | 4 - 42 | Scottish Power Renewables 2019b |
| Totals | 1.2 – 20 | 10.4 – 118 | 18.4 – 214 | 37 - 409 | |

12.3.3.1.2 Context for Assessment using SeaMAST Dataset

11. The Seabird Mapping and Sensitivity Tool (SeaMAST) (Bradbury et al., 2014) provides a common dataset covering the majority of English waters, describing seabird densities in 3x3km squares using both boat-based and visual aerial surveys. This dataset was used to assess the potential relative contribution of UK OWFs in the southern North Sea to displacement of red-throated divers during the non-breeding season. The remainder of this document describes work undertaken to achieve this, which was based on a similar exercise previously undertaken for the Thanet Extension OWF (APEM 2019).
12. The “BDMPS_Non_Breeding_Boat_Plus_Aerial_D” SeaMAST dataset was selected to describe red-throated diver densities during the non-breeding season (henceforth referred to as “the SeaMAST dataset”). This dataset provides estimated seabird non-breeding season densities (sitting and flying birds summed) from a density surface model (DSM) of Wildfowl and Wetlands Trust (WWT) visual aerial survey data collected between 2001 - 2011, and JNCC European Seabirds At Sea (ESAS) boat-based survey data collected between 1979 - 2011.
13. **Table A12.3.8** below includes all UK offshore wind farms in the North Sea. Most wind farm boundaries were obtained from the Crown Estate, with any known changes to site boundaries accounted for prior to data processing. All 3x3 km grid squares that had been allocated the value “-99”, indicating a low confidence in the density generated by the DSM for that square, were excluded from the analysis. This led to a number of wind farms in English waters being excluded from the analysis as no abundance data were available. These were Dudgeon, Hornsea Projects One, Two and Three, Dogger Bank Creyke Beck A and B, Sofia, Teeside A and Triton Knoll. As the SeaMAST dataset does not include Scottish Territorial Waters, Scottish OWFs in the North Sea (i.e. Aberdeen (EOWDC), Beatrice, Beatrice Demonstrator, Hywind, Kincardine, Seagreen Alpha and Bravo, Inch Cape and Neart na Gaoithe) were not included in the assessment.
14. The red-throated diver non-breeding season is defined as September to February (Furness, 2015; WWT Consulting, 2015), and the SeaMAST dataset included data collected throughout this time period. As the SeaMAST dataset is a collation of available data, which at the time was not collected for the purpose of a wider regional analysis, across some areas, survey effort may have occurred disproportionately over particular months or seasons depending on the original purpose of the surveys. The red-throated diver non-breeding season was further subdivided by Furness (2015) into post-breeding migration (September to November), migration-free winter season (December to January) and return migration (February to April). During the two migration seasons, the north-

western and south-western North Sea areas are considered to hold a single population of red-throated divers. During the migration-free winter season, it is considered that the north-western and south-western North Sea area populations are separate (Furness, 2015).

15. To calculate the number of red-throated divers occurring within a given area, the red-throated diver density for each grid square was converted to an abundance by multiplying density by area. For areas inside wind farm red line boundaries, the SeaMAST dataset encompassing the area of interest was clipped to the boundary of each wind farm. When repeating the exercise for the 4km OWF buffers, where there were instances of overlap between the buffers, and sometimes other OWFs, a system was devised to allocate red-throated divers to a particular OWF based on the tiered system for CIA based on advice from UK SNCBs (Scottish Power Renewables, 2016).
16. For overlapping OWFs and buffers occurring within tiers 1 and/or 2 (e.g. Greater Gabbard and Galloper OWFs), buffers were amalgamated into a single polygon. Where a similar situation occurred for OWFs in tier 3 or above, OWF red line boundaries were prioritised over buffers. For overlapping buffers within the same tier, the abundance of red-throated divers within the overlapping area was calculated and split equally between the two buffers.
17. The results of this assessment are presented in the tables below. It should be noted that recent advice from Natural England is that digital aerial surveys are considered the new standard for monitoring this red-throated divers. Large increases in the numbers of red-throated divers recorded within the Outer Thames estuary SPA in 2013 and 2018 (Irwin et al. 2019), compared with the population as estimated at the time of designation in 2010, were thought to reflect these improved survey techniques. Natural England's view was that previous survey methods (i.e. boat based and visual aerial surveys) had under-estimated the numbers present in the SPA. Thus the SEaMAST data set is based on survey methods which may underestimate the numbers of red-throated divers present. Population estimates presented in the table below for offshore windfarms and 4km buffers, as well as the reference population to which they are compared, are therefore likely to be underestimates. They are thus are not intended to provide robust estimates, but a basis for comparison of the relative numbers and proportions of birds in each offshore wind farm in relation to the estimated population in the reference area. The reference area was based on the South Western North Sea biogeographic area, as identified by Furness (2015). The reference population size used here for the non-breeding season was 19,978 based on the SeaMAST data set (not the BDMPS estimate for the winter period for the South West North Sea, as presented in Furness 2015).

Table A12.3.8 Estimated Cumulative Displacement Risk of Red-throated Divers for UK offshore wind farms in the North Sea

| Tier | Windfarm | % of Reference Population (OWF) | OWF Red-throated Diver Abundance | % of Reference Population (4km Buffer) | 4km Buffer Red-throated Diver Abundance | Total Site % Of Reference Population | Total Site Abundance | Notes |
|------|----------------------------|---------------------------------|----------------------------------|--|---|--------------------------------------|----------------------|---|
| 1 | Aberdeen (EOWDC) | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 1 | Beatrice Demonstrator | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 1 | Blyth Demonstration | 0.000 | 0.044 | 0.003 | 0.534 | 0.003 | 0.577 | Site consists of three polygons; 4km buffers amalgamated |
| 1 | Dudgeon | | | | | | | Beyond extent of viable SeaMAST data - not included |
| 1 | Greater Gabbard & Galloper | 0.177 | 35.404 | 0.390 | 77.930 | 0.567 | 113.334 | 4km buffer overlap with East Anglia TWO; Greater Gabbard/Galloper prioritised |
| 1 | Gunfleet Sands | 0.270 | 54.038 | 2.439 | 487.209 | 2.709 | 541.246 | - |
| 1 | Humber Gateway | 0.000 | 0.079 | 0.004 | 0.744 | 0.004 | 0.823 | - |
| 1 | Hywind | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 1 | Kentish Flats | 0.243 | 48.552 | 1.721 | 343.744 | 1.964 | 392.296 | - |
| 1 | London Array | 1.689 | 337.438 | 5.832 | 1165.117 | 7.521 | 1502.555 | - |

| Tier | Windfarm | % of Reference Population (OWF) | OWF Red-throated Diver Abundance | % of Reference Population (4km Buffer) | 4km Buffer Red-throated Diver Abundance | Total Site % Of Reference Population | Total Site Abundance | Notes |
|------|-------------------------------|---------------------------------|----------------------------------|--|---|--------------------------------------|----------------------|---|
| 1 | Lincs, Lynn and Inner Dowsing | 0.015 | 3.075 | 0.092 | 18.419 | 0.108 | 21.495 | - |
| 1 | Race Bank | 0.003 | 0.672 | 0.014 | 2.700 | 0.017 | 3.372 | Northeastern edge of buffer not covered by SeaMAST data |
| 1 | Scroby Sands | 0.048 | 9.661 | 0.400 | 79.961 | 0.449 | 89.622 | - |
| 1 | Sheringham Shoal | 0.000 | 0.097 | 0.003 | 0.588 | 0.003 | 0.685 | Northern section of OWF and buffer not covered by SeaMAST data |
| 1 | Teeside | 0.000 | 0.046 | 0.004 | 0.816 | 0.004 | 0.863 | - |
| 1 | Thanet | 0.029 | 5.721 | 0.174 | 34.824 | 0.203 | 40.545 | - |
| 1 | Westermost Rough | 0.001 | 0.118 | 0.004 | 0.785 | 0.005 | 0.903 | Northeastern edge of buffer not covered by SeaMAST data |
| 1 | Beatrice | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 2 | East Anglia ONE | 0.029 | 5.752 | 0.081 | 16.118 | 0.109 | 21.870 | 4km buffer overlap with East Anglia ONE North; East Anglia ONE buffer prioritised |
| 2 | Hornsea Project One | - | - | - | - | - | - | Beyond extent of viable SeaMAST data - not included |
| 2 | Kincardine | - | - | - | - | - | - | Scottish Territorial Waters - not included |

| Tier | Windfarm | % of Reference Population (OWF) | OWF Red-throated Diver Abundance | % of Reference Population (4km Buffer) | 4km Buffer Red-throated Diver Abundance | Total Site % Of Reference Population | Total Site Abundance | Notes |
|------|--|---------------------------------|----------------------------------|--|---|--------------------------------------|----------------------|---|
| 3 | Dogger Bank Creyke Beck Projects A and B | - | - | - | - | - | - | Beyond extent of viable SeaMAST data - not included |
| 3 | Dogger Bank Teeside A and B (now Sofia) | - | - | - | - | - | - | Beyond extent of viable SeaMAST data - not included |
| 3 | East Anglia THREE | 0.029 | 5.852 | 0.066 | 13.222 | 0.095 | 19.074 | 4km buffer overlap with Norfolk Vanguard East; East Anglia THREE buffer prioritised |
| 3 | Forth (Seagreen) Alpha and Bravo | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 3 | Hornsea Project Two | - | - | - | - | - | - | Beyond extent of viable SeaMAST data - not included |
| 3 | Inch Cape | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 2 | Moray Firth East | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 3 | Neart na Gaoithe | - | - | - | - | - | - | Scottish Territorial Waters - not included |

| Tier | Windfarm | % of Reference Population (OWF) | OWF Red-throated Diver Abundance | % of Reference Population (4km Buffer) | 4km Buffer Red-throated Diver Abundance | Total Site % Of Reference Population | Total Site Abundance | Notes |
|------|-----------------------|---------------------------------|----------------------------------|--|---|--------------------------------------|----------------------|---|
| 3 | Triton Knoll | - | - | - | - | - | - | Beyond extent of viable SeaMAST data - not included |
| 4 | Hornsea Project Three | - | - | - | - | - | - | Beyond extent of viable SeaMAST data - not included |
| 3 | Moray Firth West | - | - | - | - | - | - | Scottish Territorial Waters - not included |
| 4 | Norfolk Boreas | 0.015 | 2.900 | 0.017 | 3.455 | 0.023 | 4.628 | Northern and eastern sections of OWF and 4km buffer beyond extent of viable SeaMAST data; 4km buffer overlap with Norfolk Vanguard East (4km buffers amalgamated) |
| 4 | Norfolk Vanguard East | 0.015 | 2.978 | | | 0.024 | 4.706 | Eastern section of OWF and 4km buffer beyond extent of viable SeaMAST data; 4km buffer overlap with Norfolk Boreas and East Anglia THREE (East Anglia THREE prioritised, Norfolk Vanguard East and Boreas 4km buffer amalgamated) |
| 4 | Norfolk Vanguard West | 0.032 | 6.410 | 0.068 | 13.514 | 0.100 | 19.924 | - |
| 4 | Thanet Extension | 0.009 | 1.754 | 0.299 | 59.648 | 0.307 | 61.402 | - |

| Tier | Windfarm | % of Reference Population (OWF) | OWF Red-throated Diver Abundance | % of Reference Population (4km Buffer) | 4km Buffer Red-throated Diver Abundance | Total Site % Of Reference Population | Total Site Abundance | Notes |
|------|-----------------------|---------------------------------|----------------------------------|--|---|--------------------------------------|----------------------|--|
| 4 | East Anglia TWO | 0.095 | 18.982 | 0.358 | 71.439 | 0.453 | 90.421 | 4km buffer overlap with Greater Gabbard/Galloper; Greater Gabbard/Galloper prioritised |
| 4 | East Anglia ONE North | 0.484 | 96.598 | 1.053 | 210.292 | 1.536 | 306.890 | 4km buffer overlap with East Anglia ONE; East Anglia ONE buffer prioritised |
| | TOTALS | 3.2 | 636.2 | 13.0 | 2601.1 | 16.2 | 3237.2 | - |

18. **Table A12.3.9** below summarises the estimated total abundance of red-throated divers in offshore wind farms and 4km buffers for Tiers 1 to 4, based on the SeaMAST dataset. For each Tier, the percentage contribution to the total estimated population of red-throated divers within offshore wind farms and 4km buffers is also given. Under the worst case scenario of 100% displacement of red-throated divers from each wind farm and 4km buffer, this table gives the relative contribution of each Tier to the total numbers of birds likely to be displaced from offshore wind farms.

Table A12.3.9 Estimated Total Abundance of Red-Throated Divers in Offshore Windfarms and 4km Buffers for Tiers 1 to 4

| Tier/Exception | Total Red-throated Diver Abundance (OWF and 4km Buffer) | Percentage of Reference population | Relative Contribution to Potential Displacement within Reference Population Area |
|----------------|---|------------------------------------|--|
| 1 | 2708.3 | 13.6% | 83.7% |
| 2 | 21.9 | 0.1% | 0.7% |
| 3 | 19.1 | 0.1% | 0.6% |

| Tier/Exception | Total Red-throated Diver Abundance (OWF and 4km Buffer) | Percentage of Reference population | Relative Contribution to Potential Displacement within Reference Population Area |
|----------------|---|------------------------------------|--|
| 4 (minus EA1N) | 181.1 | 0.9% | 5.6% |
| EA1N | 306.9 | 1.54% | 9.5% |

12.3.3.2 Razorbill

Table A12.3.10 Estimated Cumulative Displacement Risk of Razorbill

| Tier | Windfarm | Birds at risk of displacement | | | | Source of Information and Notes |
|------|-----------------------|-------------------------------|------------------|---------|------------------|--|
| | | Breeding | Autumn Migration | Winter | Spring Migration | |
| 1 | Aberdeen (EOWDC) | 161 | 64.4 | 7.3 | 25.7 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Beatrice Demonstrator | No data | No data | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Blyth Demonstration | 121 | 90.9 | 60.6 | 90.9 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Dudgeon | 256 | 346.1 | 745.4 | 346.1 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Galloper | 44 | 43 | 105.5 | 394 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Greater Gabbard | 0 | 0 | 387.3 | 83.8 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Gunfleet Sands | No data | No data | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Humber Gateway | 27 | 20 | 13.4 | 20 | (Macarthur Green, 2019a; Smart Wind, 2015d). |

| Tier | Windfarm | Birds at risk of displacement | | | | Source of Information and Notes |
|------|--------------------------------|-------------------------------|------------------|---------|------------------|--|
| | | Breeding | Autumn Migration | Winter | Spring Migration | |
| 1 | Hywind | 30 | 719 | 10 | 0 | (Macarthur Green, 2019a). |
| 1 | Kentish Flats | No data | No data | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Lynn and Inner Dowsing & Lincs | 45 | 33.5 | 22.3 | 33.5 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | London Array | 14 | 20.4 | 13.6 | 20.4 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Race Bank | 28 | 42 | 28 | 42 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Scroby Sands | No data | No data | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Sheringham Shoal | 106 | 1343 | 211.3 | 30.2 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Teeside | 16 | 61.5 | 1.9 | 20 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Thanet | 3 | 0 | 13.6 | 20.9 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Westermost Rough | 91 | 121.3 | 151.6 | 90.9 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Beatrice | 873 | 833 | 555.3 | 833 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | East Anglia ONE | 16 | 26 | 154.5 | 336 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | Hornsea Project One | 1109 | 4812.3 | 1517.5 | 1802.8 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | Kincardine | 22 | 0 | 0 | 0 | (Macarthur Green, 2019a). |

| Tier | Windfarm | Birds at risk of displacement | | | | Source of Information and Notes |
|------|--|-------------------------------|------------------|--------|------------------|---|
| | | Breeding | Autumn Migration | Winter | Spring Migration | |
| 3 | Dogger Bank Creyke Beck Projects A and B | 2788 | 3673 | 3871 | 9267.7 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 1987 | 902.6 | 2384.5 | 4872.3 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | East Anglia THREE | 1807 | 1122 | 1499 | 1524 | (Macarthur Green, 2019a). |
| 3 | Forth (Seagreen) Alpha and Bravo | 9574 | 853.1 | 568.8 | 853.1 | (Macarthur Green, 2019a) – total was 2275 (non-breeding season); divided equally by month according to BDMPS seasons (Furness, 2015). |
| 3 | Hornsea Project Two | 2511 | 4220.5 | 719.5 | 1668 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Inch Cape | 4671 | 1839.4 | 1226.3 | 1839.4 | (Inch Cape Offshore, 2018) - total was 4905 (non-breeding season); divided equally by month according to BDMPS seasons (Furness, 2015). |
| 3 | Moray Firth East | 2423 | 1102.6 | 30.2 | 168.3 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Near na Gaoithe | 1248 | 1162.9 | 775.3 | 1162.9 | (GoBe Consultants, 2018) - total was 3101 (non-breeding season); divided equally by month according to BDMPS seasons (Furness, 2015). |
| 3 | Triton Knoll | 40 | 253.7 | 854.5 | 116.7 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 4 | Hornsea Project Three | 630 | 2020 | 3649 | 1236 | (Macarthur Green, 2019a). |

| Tier | Windfarm | Birds at risk of displacement | | | | Source of Information and Notes |
|------------------------|-----------------------|-------------------------------|------------------|--------|------------------|--|
| | | Breeding | Autumn Migration | Winter | Spring Migration | |
| 4 | Moray Firth West | 2808 | 3544 | 184 | 3585 | (Macarthur Green, 2019a). |
| 4 | Norfolk Boreas | 345 | 630 | 263 | 1065 | (Royal HaskoningDHV, 2018b). |
| 4 | Norfolk Vanguard | 879 | 866 | 839 | 769 | (Macarthur Green, 2019a). |
| 4 | Thanet Extension | 0 | 6 | 56 | 124 | Vattenfall Wind Power Ltd (2018) |
| 4 | East Anglia TWO | 280.9 | 44.1 | 136.4 | 229.9 | (Scottish Power Renewables, 2019a). |
| 4 | East Anglia ONE North | 403 | 85 | 54 | 207 | (Scottish Power Renewables, 2019b). |
| TOTALS FOR CIA | | 35285 | 30901 | 21110 | 32879 | TOTALS FOR CIA are the numbers used in the CIA, AS BUILT TOTALS show the reductions if as-built (but not consented) numbers are used |
| AS BUILT TOTALS | | N/A | N/A | N/A | N/A | |

12.3.3.3 Guillemot

Table A12.3.11 Estimated Cumulative Displacement Risk of Guillemot

| Tier | Windfarm | Birds at risk of displacement | | Source of Information and Notes |
|------|--------------------------------|-------------------------------|--------------|--|
| | | Breeding | Non-breeding | |
| 1 | Aberdeen (EOWDC) | 547 | 225 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Beatrice Demonstrator | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Blyth Demonstration | 1220 | 1321 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Dudgeon | 334 | 542 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Galloper | 305 | 593 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Greater Gabbard | 345 | 548 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Gunfleet Sands | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Humber Gateway | 99 | 138 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Hywind | 249 | 2136 | (Macarthur Green, 2019a). |
| 1 | Kentish Flats | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Lynn and Inner Dowsing & Lincs | 582 | 814 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | London Array | 192 | 377 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Race Bank | 361 | 708 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Scroby Sands | No data | No data | (Macarthur Green, 2019a; Smart Wind, 2015d). |

| Tier | Windfarm | Birds at risk of displacement | | Source of Information and Notes |
|------|--|-------------------------------|--------------|--|
| | | Breeding | Non-breeding | |
| 1 | Sheringham Shoal | 390 | 715 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Teeside | 267 | 901 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Thanet | 18 | 124 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 1 | Westermost Rough | 347 | 486 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | Beatrice | 13610 | 2755 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | East Anglia ONE | 274 | 640 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | Hornsea Project One | 9836 | 8097 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 2 | Kincardine | 632 | 0 | (Macarthur Green, 2019a). |
| 3 | Dogger Bank Creyke Beck Projects A and B | 14886 | 16763 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 8494 | 5969 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | East Anglia THREE | 1744 | 2859 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Forth (Seagreen) Alpha and Bravo | 24724 | 8800 | (Macarthur Green, 2019a). |
| 3 | Hornsea Project Two | 7735 | 13164 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Inch Cape | 8184 | 3912 | (Inch Cape Offshore, 2018). |

| Tier | Windfarm | Birds at risk of displacement | | Source of Information and Notes |
|------------------------|-----------------------|-------------------------------|--------------|--|
| | | Breeding | Non-breeding | |
| 3 | Moray Firth East | 9820 | 547 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 3 | Neart na Gaoithe | 4894 | 7618 | (GoBe Consultants, 2018). |
| 3 | Triton Knoll | 425 | 746 | (Macarthur Green, 2019a; Smart Wind, 2015d). |
| 4 | Hornsea Project Three | 13374 | 17772 | (Macarthur Green, 2019a). |
| 4 | Moray Firth West | 24426 | 38174 | (Macarthur Green, 2019a). |
| 4 | Norfolk Boreas | 7767 | 13777 | (Royal HaskoningDHV, 2018b). |
| 4 | Norfolk Vanguard | 4320 | 4776 | (Macarthur Green, 2019a). |
| 4 | Thanet Extension | 12 | 1105 | (Macarthur Green, 2019a). |
| 4 | East Anglia TWO | 2077 | 1675 | (Scottish Power Renewables, 2019a). |
| 4 | East Anglia ONE North | 4183 | 1888 | (Scottish Power Renewables, 2019b). |
| TOTALS FOR CIA | | 166,673 | 160,665 | TOTALS FOR CIA are the numbers used in the CIA, AS BUILT TOTALS show the reductions if as-built (but not consented) numbers are used |
| AS BUILT TOTALS | | N/A | N/A | |

12.3.3.4 Gannet

19. All data for cumulative gannet displacement are taken from (Macarthur Green, 2019a), except for East Anglia ONE North (Scottish Power Renewables, 2019b), East Anglia TWO (Scottish Power Renewables, 2019a) and Norfolk Boreas (Royal HaskoningDHV, 2018b).

Table A12.3.12 Estimated Cumulative Displacement Risk of Gannet

| Tier | Windfarm | Buf km | Birds at risk of displacement | | | | 60% Displacement, 1% Mortality | | | | 80% Displacement, 1% Mortality | | | |
|------|------------------|---------|-------------------------------|------|-------|---------|--------------------------------|------|-------|---------|--------------------------------|------|-------|-------|
| | | | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l |
| 1 | Aberdeen (EOWDC) | 2 | 0 | 35 | 5 | 40 | 0.0 | 0.2 | 0.0 | 0.2 | 0.0 | 0.3 | 0.0 | 0.3 |
| 1 | Beatrice Dem. | No data | | | | No data | | | | No data | | | | |
| 1 | Blyth Dem. | No data | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 | Dudgeon | 1 | 11 | 53 | 25 | 89 | 0.1 | 0.3 | 0.2 | 0.5 | 0.1 | 0.4 | 0.2 | 0.7 |
| 1 | Galloper | 4 | 276 | 360 | 907 | 1543 | 1.7 | 2.2 | 5.4 | 9.3 | 2.2 | 2.9 | 7.3 | 12.3 |
| 1 | Greater Gabbard | 0 | 105 | 252 | 69 | 426 | 0.6 | 1.5 | 0.4 | 2.6 | 0.8 | 2.0 | 0.6 | 3.4 |
| 1 | Gunfleet Sands | No data | 9 | 0 | 12 | 21 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 | 0.2 |
| 1 | Humber Gateway | No data | | | | No data | | | | No data | | | | |
| 1 | Hywind | 1 | 4 | 10 | 0 | 14 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 |

| Tier | Windfarm | Buf km | Birds at risk of displacement | | | | 60% Displacement, 1% Mortality | | | | 80% Displacement, 1% Mortality | | | |
|------|--------------------------------|-----------|-------------------------------|------|-------|---------|--------------------------------|------|-------|---------|--------------------------------|------|-------|-------|
| | | | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l |
| 1 | Kentish Flats | No data | | | | No data | | | | No data | | | | |
| 1 | Kentish Flats Ext. | 2 | 0 | 0 | 13 | 13 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 |
| 1 | London Array | No data | | | | No data | | | | No data | | | | |
| 1 | Lynn and Inner Dowsing & Lincs | No data | | | | No data | | | | No data | | | | |
| 1 | Race Bank | 1 | 29 | 92 | 32 | 153 | 0.2 | 0.6 | 0.2 | 0.9 | 0.2 | 0.7 | 0.3 | 1.2 |
| 1 | Rampion | No data | 0 | 0 | 590 | 590 | 0 | 0 | 3.5 | 3.5 | 0 | 0 | 4.7 | 4.7 |
| 1 | Scroby Sands | No data | | | | No data | | | | No data | | | | |
| 1 | Sher'm Shoal | No data | 2 | 47 | 31 | 80 | 0.0 | 0.3 | 0.2 | 0.5 | 0.0 | 0.4 | 0.2 | 0.6 |
| 1 | Teeside | No data | 0 | 1 | 0 | 1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 | Thanet | No data | | | | No data | | | | No data | | | | |
| 1 | Westermost Rough | No data | | | | No data | | | | No data | | | | |

| Tier | Windfarm | Buf km | Birds at risk of displacement | | | | 60% Displacement, 1% Mortality | | | | 80% Displacement, 1% Mortality | | | |
|------|---|--------|-------------------------------|--------|--------|--------|--------------------------------|------|-------|-------|--------------------------------|------|-------|-------|
| | | | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l |
| 2 | Beatrice | 0.5 | 0 | 151 | 0 | 151 | 0.0 | 0.9 | 0.0 | 0.9 | 0.0 | 1.2 | 0.0 | 1.2 |
| 2 | East Anglia ONE | 4 | 76 | 161 | 3638 | 3875 | 0.5 | 1.0 | 21.8 | 23.3 | 0.6 | 1.3 | 29.1 | 31.0 |
| 2 | Hornsea Project One | 4 | 250 | 671 | 694 | 1615 | 1.5 | 4.0 | 4.2 | 9.7 | 2.0 | 5.4 | 5.6 | 12.9 |
| 2 | Kincardine | 1 | 0 | 120 | 0 | 120 | 0.0 | 0.7 | 0.0 | 0.7 | 0.0 | 1.0 | 0.0 | 1.0 |
| 3 | Dogger Bank Creyke Beck Projects A and B | 2 | 394.0 | 1155.0 | 2048.0 | 3597.0 | 2.4 | 6.9 | 12.3 | 21.6 | 3.2 | 9.2 | 16.4 | 28.8 |
| 3 | Dogger Bank Teeside A and B (now Sofia) | 2 | 464.0 | 2250.0 | 887.0 | 3601.0 | 2.8 | 13.5 | 5.3 | 21.6 | 3.7 | 18.0 | 7.1 | 28.8 |
| 3 | East Anglia THREE | 4 | 524 | 412 | 1269 | 2205 | 3.1 | 2.5 | 7.6 | 13.2 | 4.2 | 3.3 | 10.2 | 17.6 |
| 3 | Forth (Seagreen) Alpha and Bravo | 0 | 332.0 | 2956.0 | 664.0 | 3952.0 | 2.0 | 17.7 | 4.0 | 23.7 | 2.7 | 23.6 | 5.3 | 31.6 |

| Tier | Windfarm | Buf km | Birds at risk of displacement | | | | 60% Displacement, 1% Mortality | | | | 80% Displacement, 1% Mortality | | | |
|------|-----------------------|--------|-------------------------------|-------|--------|--------|--------------------------------|------|-------|-------|--------------------------------|------|-------|-------|
| | | | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l |
| 3 | Hornsea Project Two | 4 | 124 | 457 | 1140 | 1721 | 0.7 | 2.7 | 6.8 | 10.3 | 1.0 | 3.7 | 9.1 | 13.8 |
| 3 | Inch Cape | 4 | 212 | 2398 | 703 | 3313 | 1.3 | 14.4 | 4.2 | 19.9 | 1.7 | 19.2 | 5.6 | 26.5 |
| 3 | Moray Firth East | 4 | 27 | 564 | 292 | 883 | 0.2 | 3.4 | 1.8 | 5.3 | 0.2 | 4.5 | 2.3 | 7.1 |
| 3 | Neart na Gaoithe | 2 | 281 | 1987 | 552 | 2820 | 1.7 | 11.9 | 3.3 | 16.9 | 2.2 | 15.9 | 4.4 | 22.6 |
| 3 | Triton Knoll | 1 | 24 | 211 | 15 | 250 | 0.1 | 1.3 | 0.1 | 1.5 | 0.2 | 1.7 | 0.1 | 2.0 |
| 4 | Hornsea Project Three | 4 | 1099 | 1203 | 1494 | 3796 | 6.6 | 7.2 | 9.0 | 22.8 | 8.8 | 9.6 | 12.0 | 30.4 |
| 4 | Moray Firth West | 4 | 144 | 2827 | 439 | 3410 | 0.9 | 17.0 | 2.6 | 20.5 | 1.2 | 22.6 | 3.5 | 27.3 |
| 4 | Norfolk Vanguard | 2 | 437.0 | 271.0 | 2453.0 | 3161.0 | 2.6 | 1.6 | 14.7 | 19.0 | 3.5 | 2.2 | 19.6 | 25.3 |
| 4 | Norfolk Boreas | 2 | 526 | 1229 | 1723 | 3478 | 3.2 | 7.4 | 10.3 | 20.9 | 4.2 | 9.8 | 13.8 | 27.8 |
| 4 | Thanet Extension | 4 | 384 | 27 | 324 | 735 | 2.3 | 0.2 | 1.9 | 4.4 | 3.1 | 0.2 | 2.6 | 5.9 |

| Tier | Windfarm | Buf km | Birds at risk of displacement | | | | 60% Displacement, 1% Mortality | | | | 80% Displacement, 1% Mortality | | | |
|------------------------|-----------------------|------------|-------------------------------|--------------|--------------|--------------|--------------------------------|------------|------------|------------|--------------------------------|------------|------------|------------|
| | | | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l | Sp'g | Br'g | Aut'm | Ann'l |
| 4 | East Anglia TWO | 2 | 192 | 192 | 891 | 1275 | 1.2 | 1.2 | 5.3 | 7.6 | 1.5 | 1.5 | 7.1 | 10.2 |
| 4 | East Anglia ONE North | 2 | 44 | 149 | 468 | 661 | 0.3 | 0.9 | 2.8 | 4.0 | 0.4 | 1.2 | 3.7 | 5.3 |
| TOTALS FOR CIA | | N/A | 5970 | 20241 | 21378 | 47589 | 36 | 122 | 128 | 286 | 48 | 162 | 171 | 381 |
| AS BUILT TOTALS | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

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