A585 Windy Harbour to Skippool Improvement Scheme

TR010035

5.4 Habitats Regulations Assessment

APFP Regulation 5(2)(g)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009

Windy Harbour to Skippool Improvement Scheme

Development Consent Order 201[ ]

5.4 HABITATS REGULATIONS ASSESSMENT

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1 EXECUTIVE SUMMARY

1.1.1 Highways England is applying to the Secretary of State for Transport (through the Planning Inspectorate) for a Development Consent Order (DCO) to implement a new bypass Scheme from Windy Harbour at the junction of the A585 and A586 to Skippool, west of the A588.

1.1.2 The Scheme is not located within any European sites and is not directly connected with, or necessary for the management of any European sites. Nor is it associated with emergency works. However, the potential presence of mobile qualifying species associated with Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site within and adjacent to the Scheme meant that there was a requirement for the potential for effects on such sites to be considered. This Habitats Regulations Assessment (HRA) Report therefore provides HRA Stage 1 (Screening) and HRA Stage 2 (Appropriate Assessment (AA)) of the Scheme.

1.1.3 A comprehensive suite of bird surveys was carried out to gain a detailed understanding of the use of land in proximity to the Scheme by qualifying bird species. The survey area and methodology were agreed in consultation with Natural England.

1.1.4 The Screening exercise concluded that the potential for likely significant effects could not be ruled out for the following qualifying features: pink-footed geese, lapwing, curlew, and little egret. This was on the basis that peak numbers for each species recorded during bird surveys (undertaken over 2 survey seasons 2016 – 2018) exceeded the 1% or greater significance threshold of the SPA/Ramsar site population within 300m of the Scheme.

1.1.5 The potential effects identified during the construction phase of the Scheme comprised: potential displacement / disturbance to bird species in the fields adjacent to the construction area; loss of foraging / roosting habitat under the footprint of the construction site; and changes in water quality as a result of the construction works. The potential effects identified during the operation phase of the Scheme comprised: potential displacement / disturbance to bird species; and loss of foraging / roosting habitat under the footprint of the completed Scheme.

1.1.6 The AA identified the need for measures to mitigate for potential water quality and disturbance / displacement effects during the construction phase. An ecological Mitigation Area has been included in the Scheme design (and included in the draft order limits). The Mitigation Area would be temporarily acquired by Highways England as essential mitigation and would provide alternative foraging habitat for the duration of the construction period. This, and measures to protect water quality would be secured in the DCO through the Construction and Environment Management Plan (CEMP).

1.1.7 It is concluded, on the basis of the information provided within this HRA Report, that the Scheme would not prevent Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site from achieving their Conservation Objectives, and therefore there would be **no adverse effect on the integrity** of any European sites and features as a result of the Scheme, alone (with mitigation in place as set out in the Outline CEMP – document reference TR010035/APP/7.2, and associated Bird Mitigation Strategy) or in-combination with other plans and schemes. The need for a further examination of alternative designs, activities and

process is therefore not considered necessary.

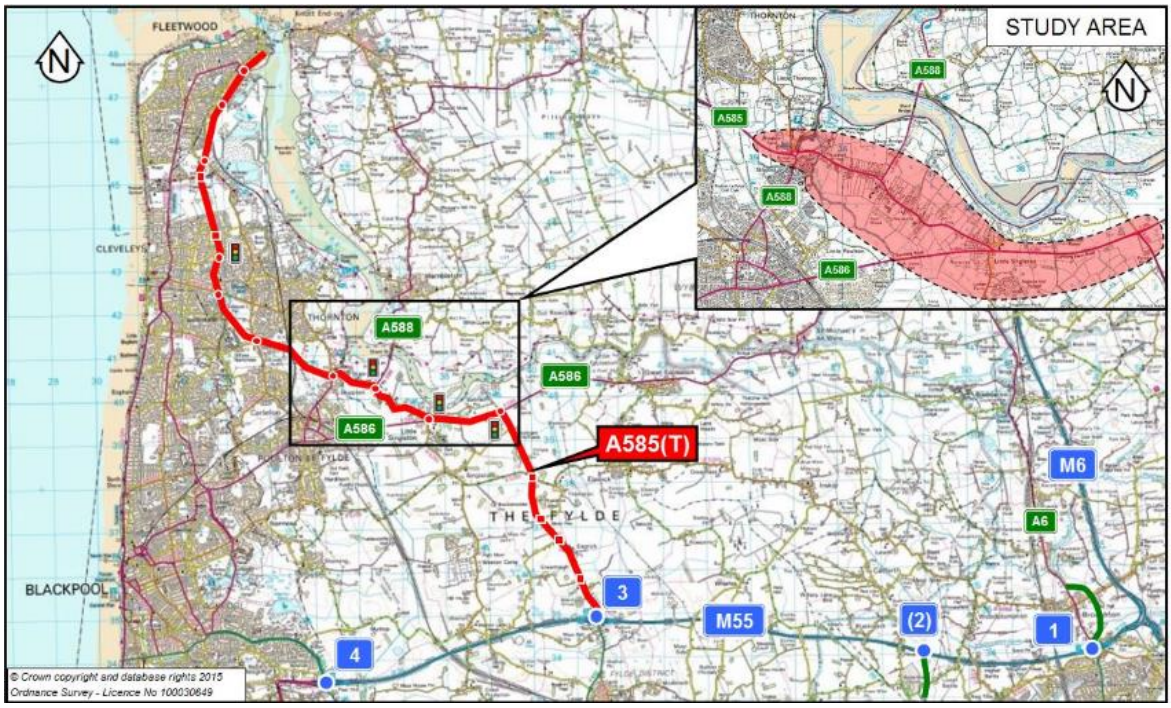
2 INTRODUCTION

2.1 Overview of the Scheme

2.1.1 The A585 (T) is a single carriageway trunk road, which provides the only viable access from the motorway network into Fleetwood and its urban areas. As a result, it suffers from extreme congestion. The Government's Autumn Statement in 2014 identified the need for an improvement scheme along the A585 between Windy Harbour and Skippool (hereinafter referred to as 'the Scheme') to ameliorate the impact of traffic on the route between the 2 villages to remove a major bottleneck.

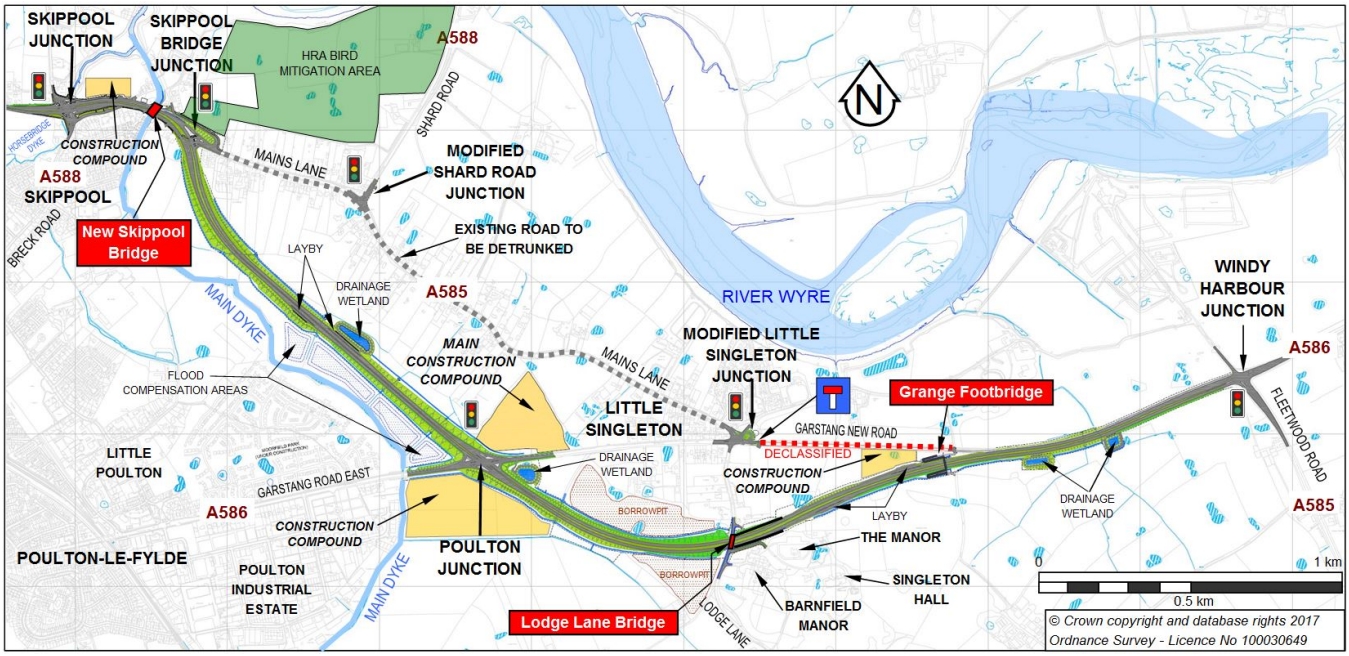
2.1.2 The Scheme comprises the construction of a new bypass from Windy Harbour at the junction of the A585 and A586 to Skippool, west of the A588. Four new junctions would be created at Windy Harbour, Poulton and Skippool (2 junctions) as part of the Scheme. Insert 2-1 shows the geographic location of the Scheme and the surrounding road network.

Insert 2-1: Scheme Location



2.1.3 The Scheme includes several components, as shown on Insert 2-2 and in more detail on Figure 1.2, within the Environmental Statement Chapter 2: Description of Scheme (document reference TR010035/APP/6.2).

Insert 2-2: Scheme Components



2.2 Purpose of this Report

2.2.1 Highways England is applying to the Secretary of State for Transport (through the Planning Inspectorate (the Inspectorate)) for a DCO) to implement the road improvement scheme. Under Article 6 of the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive") (Council Directive 92/43/EEC) an assessment is required where a plan or project may give rise to significant effects upon a Natura 2000 site (otherwise referred to as a 'European site'). The requirements of the Habitats Directive are transposed into UK law through the Conservation of Habitats and Species Regulations 2017 (the "Habitats Regulations").

2.2.2 The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009 (HMSO, 2009) require applicants for Nationally Significant Infrastructure Projects (NSIPs) that may affect a European site to provide a report with the application showing the European site(s) that may be affected, together with sufficient information to enable the decision-maker to determine whether there was a likely significant effect on such European site(s) and, if so, make an AA of the effects of the proposed NSIP on the integrity of the site.

2.2.3 The Scheme is not located within any European sites and is not directly connected with, or necessary for the management of any European sites. Nor is it associated with emergency works. However, the potential presence of mobile qualifying species of such sites within and adjacent to the Scheme, such as birds, means that it is a requirement that the potential for effects on such sites are considered.

2.2.4 This HRA Report provides the following:

- **HRA Stage 1 (Screening):** information to enable the Secretary of State for Transport (as the competent authority) to consider whether the Scheme has the potential to have a 'likely significant effect' upon European sites or a likely significant effect cannot be ruled out, either alone or in-combination with other

plans or projects

- **HRA Stage 2 (AA):** where likely significant effects on a European site are identified or cannot be ruled out, information to enable the Secretary of State to consider whether those effects would adversely affect the integrity of any European site, having regard to the conservation objective(s) of any such site

2.3 Report Structure

2.3.1 This Report is structured as follows:

- Section 3 outlines the HRA process
- Section 4 provides a description of the Scheme
- Section 5 provides an overview of the baseline information for the Scheme and surrounding habitats
- Section 6 describes the HRA Screening stage for the Scheme
- Section 7 provides the AA of the Scheme
- Section 8 outlines the overall conclusion of the HRA

3 HABITATS REGULATIONS ASSESSMENT

3.1 Background

3.1.1 This section describes the background to Natura 2000 Site designations and the legislation surrounding their protection and therefore the rationale for this assessment. This also includes references to guidance that was followed.

3.2 Purpose of the HRA

3.2.1 HRA is required wherever a scheme has the potential to affect a European site[1] designated as part of the Natura 2000 network. The HRA process is iterative and follows the stages of scheme development. This HRA follows the Guidance provided in DMRB Volume 11 Section 4 Part 1 HD 44/09 Assessment of Implications of Highways and/or Roads Projects (DMRB) on European sites as well as the Inspectorates guidance (as discussed further in Section 3.5).

3.2.2 The potential implications on European sites have been considered throughout the preliminary design of the Scheme and also at the options phase. This HRA reflects the Scheme that is to be submitted for the DCO application.

3.3 Natura 2000 Site Creation

3.3.1 In May 1992, Member States belonging to the European Union (EU) adopted legislation designed to protect the most seriously threatened habitats and species across Europe. This legislation is referred to as the Habitats Directive (Council Directive 92/43/EEC) and complements the Birds Directive (Council Directive 2009/147/EEC) (originally adopted in 1979). At the heart of both these Directives is the creation of a network of sites called Natura 2000. Natura 2000 is a network of areas designated to conserve natural habitats and species that are rare, endangered, vulnerable or endemic within the EU.

3.3.2 The Birds Directive (Council Directive 2009/147/EC) requires the establishment of Special Protection Areas (SPAs) for birds classified under Directive 2009/147/EC on the Conservation of Wild Birds (the codified version of Directive 79/409/EEC as amended) for rare, vulnerable and regularly-occurring migratory bird species and internationally important wetlands.

3.3.3 The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora), similarly requires Special Areas of Conservation (SACs) to be designated for other species, and for habitats.

3.3.4 Together, SPAs and SACs make up the Natura 2000 series. All EU Member States contribute to the network of sites in a Europe-wide partnership.

3.4 Natura 2000 Protection

3.4.1 Under Article 6 of the European Commission (EC) Habitats Directive (Council Directive 92/43/EEC) an assessment is required where a plan or project may give rise to significant effects upon a Natura 2000 site or sites (also known as ‘European sites’).

[1] Sites designated for their international nature conservation importance under EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) or Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive). Collectively, these European sites form the Natura 2000 network. In addition, as a matter of UK policy, Ramsar sites are afforded the same level of protection as European sites.

3.4.2 In addition, it is a matter of law that candidate SACs (cSACs) and Sites of Community Importance (SCI) are considered in this process; furthermore, it is Government policy that sites designated under the 1971 Ramsar Convention for their internationally important wetlands (Ramsar sites) and potential SPAs (pSPAs) are also considered. Paragraph 3, Article 6 of the Habitats Directive states that (Council Directive 92/43/EEC):

'*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to paragraph 4 (see below), the competent national authority shall agree to the plan or project only having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public*'.

3.4.3 Paragraph 4, Article 6 of the Habitats Directive states that (Council Directive 92/43/EEC):

'*If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted*.'

3.4.4 The requirements of the Habitats Directive are transposed into UK law by means of the Conservation of Habitats and Species Regulations 2017 (HMSO, 2017), hereafter referred to as the Habitats Regulations. The process of assessing the implications of development on European sites is therefore known as HRA.

3.5 The HRA Process

The Inspectorate's Guidance

3.5.1 The HRA is a multi-stage process which helps determine likely significant effects and (where appropriate) assess adverse effects on the integrity of a European site, examine alternative solutions, and provide justification for IROPI (Imperative Reasons of Overriding Public Importance) in the event that significant effects cannot be avoided. As the assessment requirements of the Habitats Directive have been applied since its inception, it has become generally accepted that the process comprises 4 stages (European Commission, 2002). These are summarised below and shown on Inset 2-1.

- **Stage One: Screening** – the process which identifies the potential for likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans and considers whether these impacts are likely to be significant, in the absence of mitigation
- **Stage Two: AA** – the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, in respect of the site's structure and function and its conservation objectives. Additionally, where adverse impacts are identified, an assessment of the potential mitigation of those impacts is undertaken. The assessment of the

effect on integrity of the site is undertaken including the effect of such mitigation

- **Stage Three: Assessment of alternative solutions** – the process which examines alternative ways of achieving the objectives of the project or plan that might avoid adverse impacts on the integrity of the Natura 2000 site
- **Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain** - following the identification of Imperative Reasons of Overriding Public Interest ("IROPI"), if it is deemed that the project or plan should be allowed to proceed, compensatory measures are identified, and their effectiveness ascertained

3.5.2 The Inspectorates Advice Note 10 (Version 8, November 2017) describes how the process outlined above should be undertaken for NSIPs. At Stage 1 (Screening) in relation to each European site considered as part of the screening exercise, the applicant would need to conclude from baseline information and consultation responses received that either:

- There are no likely significant effects on the European site(s), either alone or in combination with other plans or projects, therefore no further assessment is required
- Likely significant effects on the European site(s) exist, either alone or in combination with other plans or projects, therefore requiring an AA by the competent authority

3.5.3 A critical part of the HRA screening process is determining whether the proposals are likely to have a significant effect on European site(s) and, therefore, if they would require an AA. Judgements relating to significance should be made in the context of the qualifying interests for which the site has been designated as having European importance and, specifically, to its conservation objectives.

3.5.4 It is important to note that the burden of evidence is to show, on the basis of objective information, that the project or plan would have no significant effect on a European site. If the effect may be significant, or is not known, it would trigger the need for an AA.

3.5.5 This is based on European Court of Justice case law (the Waddenzee ruling, 2004)) which stated:

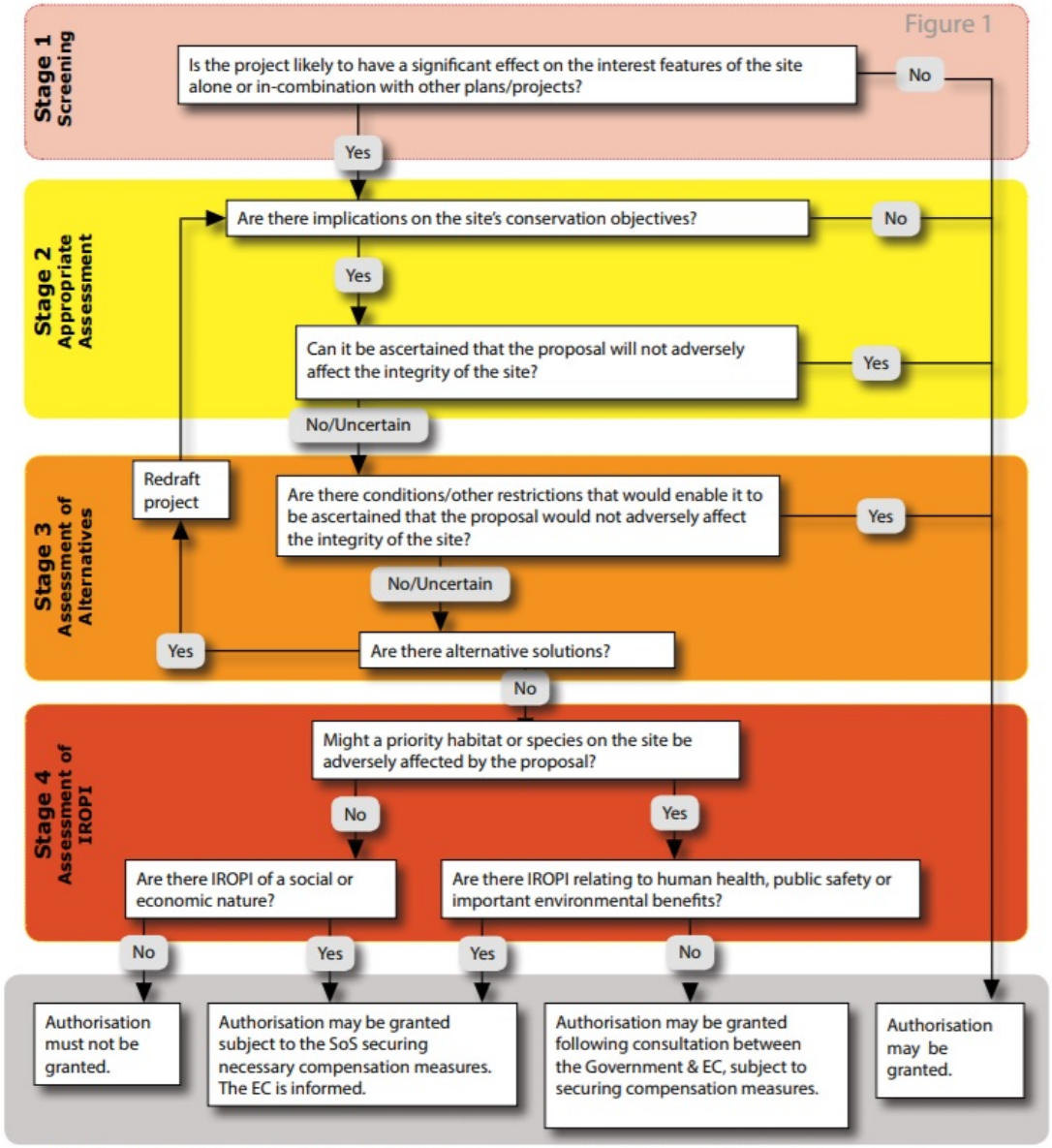
"*… any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, whether individually or in combination with other plans or projects" [and that a plan or project may only be authorised] "where no reasonable scientific doubt remains as to the absence of such effects*".

3.5.6 The definition of a likely significant effect, in this case, is any effect that may be reasonably predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated but excluding trivial or inconsequential effects.

3.5.7 The undertaking of the AA is the responsibility of the 'competent authority', in this case the Secretary of State for Transport. This HRA Report aims to provide the information required by the competent authority to undertake both the screening

and subsequent AA of the Scheme in accordance with Article 6(3) of the Habitats Directive.

Insert 3-1: Step by step approach to determining likely significant effect on a European site (taken from Figure 1 within the Inspectorates Advice Note 10 (Version 8, November 2017)



Adapted from Defra (2012) Report of the Wild Birds and Habitats Directives Implementation Review (Annex E) - It is assumed for the purposes of this advice note that the project is not directly connected with or necessary to the management of the site.

In-combination Effects

3.5.8 It is necessary for the HRA to consider not only the proposals that may lead to significant impacts upon European sites on their own, but those that may have a significant impact in combination with other plans and projects. A desk study has been undertaken to search for 'other development' that could have potential to result in cumulative effects in combination with the Scheme. These include the following and their locations are also presented on Figure 16.1, within Chapter 16: Cumulative Effects (document reference TR010035/APP/6.16). Agreement of the plans/projects included in the in-combination assessment would be set out within

the Statement of Common Ground:

- 16/00659/REMMAJ Reserved matters application for the erection of 48 residential dwellings (following the approval of outline planning consent 16/00225/OUTMAJ) Land Off Moorland Road Poulton-le-Fylde Lancashire
- 16/01043/OULMAJ Outline application for the erection of up to 130 dwellings with means of access off Holts Lane (layout, landscaping, scale and appearance reserved), following demolition of existing buildings (re-submission of 16/00233/OULMAJ). Land Off Holts Lane Poulton-le-Fylde Lancashire
- 17/00050/REMMAJ Reserved matters application for the erection of 160 dwellings with associated works Land on The East Side of Lambs Road Thornton Cleveleys Lancashire
- 17/00951/OUTMAJ Outline application for the erection of up to 66 dwellings with access applied for off Lambs Road (all other matters reserved). Land on the East Side of Lambs Road Thornton Cleveleys Lancashire
- 16/00742/OUTMAJ Outline application for the erection of up to 108 dwellings (Use Class C3) with all matters reserved except for access, which will be off Brockholes Crescent following demolition of numbers 61 and 63 Brockholes Crescent. Land Off Brockholes Crescent Poulton-le-Fylde Lancashire
- Hillhouse Enterprise Zone Power Plant Up to 900MW Megawatt electrical (MWe) Power Plant primarily using combined cycle gas turbine (CCGT) technology with optional additional open cycle gas turbine (OCGT) technology with optional additional open cycle gas turbine (OCGT) technology to help address the fluctuating energy demands of UK power consumption. The project will include a new gas pipeline, Above Ground Installations at St Michael's on Wyre and Hillhouse, and an electrical cable to Stanah substation
- The Fleetwood – Thornton Area Action Plan (AAP) establishes a clear vision and planning framework for development of Fleetwood and Thornton over the next 15-20 years and is a very important consideration in any decision on planning applications in the area. It includes areas identified for residential, industry and community facilities

3.6 HRA Guidance

3.6.1 This HRA Report has been prepared in line with the following guidance:

- The Inspectorate's Habitat Regulations Assessment Advice Note 10: Habitat Regulations Assessment relevant to nationally significant infrastructure projects, Version 8, November 2017
- The Highways Agency Interim Advice Note 141/11 (Highways Agency, 2011): Assessment of Implications (of Highways and/or Roads Projects) on European Sites (Including AA) and the Planning Act 2008
- The Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 4 Other Assessment Techniques, Part 1, HD44/09, Assessment of Implications (of Highways and/or Roads Projects) on European sites (Including AA), Section Assessment Methods (adopted in February 2009) (DMRB). This report is structured in accordance with the requirements of this guidance

- European Commission (2000) (European Commission 2000), Managing Natura 2000 sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC
- European Commission (2007) (European Commission, 2007), Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC
- European Commission (2001) (European Commission, 2001), Assessment of plans and projects significantly affecting Natura 2000 sites

4 DESCRIPTION OF THE SCHEME

4.1 Background to the Scheme

4.1.1 The Department for Transport (DfT) outlined in its Road Investment Strategy (RIS) Statement 2014 (Department for Transport, 2014), its aims for the Strategic Road Network (SRN). Part of this was to identify key investment needs on the SRN so Highways England developed a Route Based Strategy (RBS) to focus on those routes in the greatest need of improvement. The A585 Windy Harbour to Skippool Improvement Scheme was identified as a priority and included in the RIS for delivery in Road Period 1 (to start construction by March 2020).

4.1.2 In April 2014, the then Highways Agency produced the South Pennines Route Strategy (SPRS) Document (Highways Agency, 2014) with supporting evidence and Technical Annex. The South Pennines route includes the whole of the A585 from the M55 through to Fleetwood. The SPRS reports on the planned growth for the area and the possible new uses for the Port of Fleetwood. This implies a significant increase in demand for the A585 route. Consequently, ensuring that the route would accommodate any future growth is a key priority.

4.1.3 Currently the A585(T) is a single carriageway trunk road which provides the only viable access from Fleetwood to the motorway network (M55). As a result, it suffers from severe congestion, especially during peak travel times. The congestion is particularly severe at the A585/A586 signalised junction (Little Singleton) and the A585/A588 signalised junction (Shard Road). The interaction of all 3 junctions further exacerbates the congestion problems for travellers.

4.2 Description of the Proposed Scheme

4.2.1 The general arrangement of the Scheme is shown on document 2.5 (document reference TR010035/APP/2.5). The A585 Windy Harbour to Skippool Improvement Scheme ("the Scheme") consists of:

- A 4.85km (3 miles) long dual 2-lane carriageway bypass from Windy Harbour Junction to the Skippool Junction
- Four new junctions including: conversion of Skippool Junction to a traffic signal-controlled crossroads with A588 Breck Road and B5412 Skippool Road; Skippool Bridge Junction in the form of a three-arm traffic signal-controlled junction with the existing Mains Lane; Poulton Junction in the form of a signal-controlled crossroads connecting the new bypass to A586 Garstang Road East and modification to Little Singleton Junction (also known as Five Lane Ends) to accommodate U-turning traffic including buses. Between Skippool Bridge Junction and Poulton Junction the bypass is on embankment. East of Poulton Junction through to east of Lodge Lane the bypass is mostly in cutting
- Three new major structures including: replacement of Skippool Bridge; Lodge Lane Bridge and Grange Footbridge
- Alterations to the existing road network on completion of the bypass include: de-trunking the A585 between Skippool Bridge Junction and the end of Garstang New Road east of Little Singleton; applying a reduction in speed limit to 30mph and providing a combined footway/cycleway along Mains Lane between Shard Road Junction and Little Singleton; altering Garstang New Road east of Little Singleton to allow restricted access to farmers' fields and provide a shared

footway/cycleway route between Windy Harbour Junction and Little Singleton; applying a reduced speed limit of 30mph along Garstang Road East between the proposed Poulton Junction and Little Singleton and upgrading the lighting along Mains Lane and Garstang Road East

4.3 Scheme Alignment

Skippool Junction to Skippool Bridge Junction

4.3.1 Working from west to east, the Scheme would start with widening of Amounderness Way on the west approach to Skippool Junction. This junction (Ch.290) would be reconstructed from a priority roundabout to a 4-way traffic signal-controlled crossroads junction with designated turning lanes and improved provision for pedestrians and cyclists through phased timings and an increased number of crossing points. To allow full use of existing frontage accesses east of this junction, its layout would also permit U-turns only from/to the east.

4.3.2 Passing under the existing footprint of Skippool Junction roundabout is Skippool Clough culvert carrying Horsebridge Dyke northwards towards the River Wyre. It has been identified that this culvert is approaching the end of its useful life and the culvert would be replaced by a new culvert immediately east of the existing location. However, the replacement culvert may be constructed either in advance of the Scheme or as part of the Scheme. In either case, the replacement works would require significant traffic management changes including diversions of utilities apparatus affected by the replacement works. The existing culvert would either be demolished or backfilled on completion of the new culvert.

4.3.3 From the new Skippool Junction the alignment follows the same direction as the existing A585 Mains Lane but as a dual 2-lane all-purpose carriageway across the Main Dyke watercourse (Ch.575) to a new traffic signal-controlled junction (Skippool Bridge Junction (Ch.730)) which is the start of the bypass section. The section of the alignment prior to Skippool Bridge is 350m in length with a low point of 6.2m Above Ordnance Datum (AOD). Through Skippool Junction to Skippool Bridge Junction the speed limit would be 40mph due to the closeness of the junctions and frontage accesses that would be retained on both sides of the road.

4.3.4 Pedestrian and cycling facilities would be provided between these junctions and these would connect to Mains Lane.

Skippool Bridge

4.3.5 The existing bridge supporting the A585 over Main Dyke would be demolished and a new wider twin-deck bridge would be constructed to accommodate the new dual-carriageway.

4.3.6 The existing bridge is made up of 2 joined masonry structures comprising a pair of 1.8m diameter culverts widened in the 1920s by the addition of a 6.25m single span arch on the south, upstream, side.

4.3.7 The construction of the new bridge would be undertaken in 2 main stages to maintain continual traffic usage. A new, deck would be constructed first on the north side of the existing bridge. The utilities apparatus would be diverted from the existing bridge into the new northern bridge deck followed by the traffic being diverted onto the new deck.

4.3.8 The existing bridge would then be demolished that would allow the new south deck to be constructed. All traffic management changes would be in conjunction with those required for the Skippool Bridge Junction.

Skippool Bridge Junction to Poulton Junction

4.3.9 Skippool Bridge junction would form the connection between the new bypass and the existing Mains Lane including a realignment of Old Mains Lane eastwards to join Mains Lane clear of the main junction. This new junction would be a 3-way traffic signal-controlled T-junction and would include designated turning lanes and provision for pedestrians and cyclists through phased timings and dedicated crossing points. Similar to the proposed Skippool Junction, its layout would also permit U-turns only from/to the west to allow full use of existing frontage accesses west of this junction.

4.3.10 East of Skippool Bridge Junction would be dual 2-lane bypass which would be subject to the national speed limit (70mph) and would head in a south easterly direction.

4.3.11 The bypass would have no specific provision for pedestrians or cyclists as the former Mains Lane and Garstang Road East would be safer to use once most of the through traffic has diverted to the bypass. In addition, the bypass would be designated as a clearway connecting to the existing clearway on A585 Amounderness Way to the west.

4.3.12 The route would locally reach a high point of 11.0mAOD (Ch.770) southeast of Skippool Bridge Junction. From this high-point the bypass would be on an embankment up to about 3.8m high as this area is within the Main Dyke flood plain. The Scheme then descends at 0.67% gradient to cross over several ditches that would be culverted until it eventually reaches a low point at 6.4mAOD (Ch.1575) about 800m southeast of Skippool Bridge junction. The alignment then climbs gently at 0.67% gradient towards A586 Garstang Road East with the height of the embankment being a maximum of 5m high immediately north-west of Garstang Road East.

4.3.13 The existing ditches crossed by the bypass would be culverted to maintain connectivity for existing field drainage, allow floodwater to pass through the embankment in extreme conditions which would provide additional storage. Mammal ledges would also be installed in the culverts through the embankment to maintain connectivity for otters. Additionally, 3 further separate mammal underpasses would be provided for badgers.

4.3.14 Midway along the bypass between Skippool Bridge Junction and Poulton Junction, laybys would be provided on both carriageways. Near the eastbound layby a wetland area would be provided to receive and treat the highway drainage of this section of the bypass. The wetland would also limit discharge flows to Main Dyke via one of the existing retained ditches and maintenance access to the wetland would be at the eastern end of this layby.

4.3.15 West of the bypass embankment and east of Main Dyke, 4 temporary flood mitigation basins would be provided to minimise the risk of flooding during the construction period. These would be constructed between the existing field boundaries and with shallow sloping sides allowing them to continue to be used for agricultural purposes.

Poulton Junction

4.3.16 At Ch.2220, a new 4-arm skewed signalised crossroads (Poulton Junction) would provide a connection to the A586 Garstang Road East allowing access to/from Poulton-le-Fylde and Little Singleton. All roads on the immediate approach to the roundabout would be subject to a 50mph speed limit.

4.3.17 Controlled crossing facilities for pedestrians and cyclists would be provided across the north western (bypass) arm of the junction to connect the existing footway running along the north side of Garstang Road East.

4.3.18 Immediately north east of the Poulton Junction a wetland would be provided to deal with highway drainage water collected from the part of the bypass east of Poulton Junction and would be treated accordingly. Discharge flows from the wetland would pass under the bypass to connect to an existing field ditch south of Garstang Road East that then discharges to Main Dyke. Access to the wetland would be from the local road network.

Poulton Junction to Windy Harbour Junction

4.3.19 From Poulton Junction the bypass section would climb at up to 4% gradient in an eastward direction. Immediately east of Poulton Junction, the bypass would be on a short length of embankment before entering a deep cutting (8.6m at its deepest) for the route to pass under the B5260 Lodge Lane (Ch. 3090) that would be carried over the bypass on a new bridge.

4.3.20 Lodge Lane would be temporarily diverted westwards for the on-line construction of the bridge but, on completion, the bridge would be along the line of the existing road.

4.3.21 To limit land take and environmental effects of the bypass, the cutting passing near to Singleton Manor, Barnfield Manor and Singleton Hall (and its Grade II listed Ice House) would use lengths of retaining wall on both sides of the bypass extending for about 175m east of Lodge Lane. The retaining walls would consist of bored secant piles installed from the existing ground level.

4.3.22 The Lodge Lane cutting would sever the existing access road to Singleton Hall, Singleton Manor and The Coach House. A replacement access road would be provided south of the bypass with a connection to Lodge Lane immediately south of the new Lodge Lane bridge.

4.3.23 About 200m east of the retained cutting at Lodge Lane Bridge, the Scheme would continue to rise on shallow embankment to the high point of the alignment (Ch. 3420) at 18.3mAOD and pass over an existing 24” asbestos cement water main. Laybys would be provided close to this location for both carriageways.

4.3.24 East of the high point the bypass would continue on shallow embankment on a gentle right-hand curve to join the alignment of the existing Garstang New Road (Ch. 4000) that would be converted to a dual-carriageway by the provision of an additional carriageway on the south side of the existing road for the remainder of the route to the existing Windy Harbour Junction.

4.3.25 A new steel truss footbridge would be provided at Ch. 3840 to maintain the connectivity of the existing public footpath (Footpath 2 (Singleton)) that crosses the route of the bypass.

4.3.26 The existing footway on the north side of Garstang New Road would be upgraded to provide safe provision for pedestrians and cyclists and would connect westwards to the decommissioned section of Garstang New Road.

4.3.27 Two drainage wetland areas would be provided in this section to contain and treat the highway drainage. These wetland areas would discharge to existing ditches about 500m west of Windy Harbour Junction. Those ditches drain northwards to connect with the River Wyre north of Pool Foot Lane near Bankfield Farm. Maintenance access to these wetland areas would be from the westbound carriageway.

4.3.28 The recently modified Windy Harbour junction would be largely unchanged by the Scheme except for alterations on the western arm of the junction to suit the proposed dual carriageway arrangement and provision of a pedestrian/cyclist crossing of the western arm to allow those users to gain access to the improved footway/cycleway on the north side of the eastbound carriageway.

Little Singleton Junction and Garstang New Road

4.3.29 The existing Garstang New Road east of Little Singleton and west of the bypass alignment would become a no-through road but would be retained to provide part of the route for pedestrians and cyclists between Windy Harbour Junction and Little Singleton, access to fields and a route for existing utilities apparatus to avoid the latter having to be diverted.

4.4 Highways Structures

4.4.1 For details of construction sequences of these structures refer to Appendix 2.1: Construction Information (document reference TR010035/APP/6.2.1). For information about traffic management proposals refer to the draft Traffic Management Plan (document reference TR010035/APP/7.5).

Skippool Clough Culvert Replacement

4.4.2 The replacement culvert would be constructed on the east side of the existing culvert and would comprise a single 1.8m diameter pipe laid in a straight line from the existing Horsebridge Dyke west of Breck Road under the existing road network to discharge into the tidal watercourse north of the A585. New headwalls would be constructed at both ends of the culvert with a new tidal flap valve being provided on the north headwall. The existing culvert would either be excavated and backfilled or filled with light-weight concrete.

4.4.3 The timing of the culvert replacement has not been decided at the moment as it could be replaced in advance of the start of the Scheme.

4.4.4 The method of construction has not been considered in detail at this time either being excavated from ground level and backfilled or using no-dig methods. The excavated method would require a number of traffic management changes at the existing Skippool junction.

Skippool Bridge

4.4.5 The new Skippool Bridge would be constructed in 2 phases to ensure traffic continuity along the A585. The new north bridge would commence with construction of piling platforms on both sides of Main Dyke using sheet piles. The existing width of Main Dyke watercourse would be maintained and the effects on the watercourse has been discussed with the Environment Agency.

4.4.6 The abutments would be formed of bored piles and reinforced concrete pile caps. The bridge deck would comprise precast concrete beams with an in-situ reinforced concrete deck and parapets. This deck would provide for the diversion of utilities apparatus. Wing walls would be formed on either side of the abutments being either piles or L-shaped walls depending on the ground conditions.

4.4.7 On completion of the north half of the bridge and diversion of the utilities apparatus, traffic would be diverted onto this half of the bridge. This would allow the existing Skippool Bridge to be demolished. The construction of the south half of the new bridge would follow a similar sequence to that for the north bridge.

Old Mains Lane Retaining Wall

4.4.8 The retaining wall would be located north of Skippool Bridge junction and the Old Mains Lane link road and would extend for about 75m. The wall would be installed in 2 phases to maintain access to Old Mains Lane while the link road is constructed. The form of the wall would be precast concrete units to allow for speedy installation.

Lodge Lane Bridge

4.4.9 The bridge would comprise 2 continuous spans with a built-in central pier to create an integral structure. The use of 2 spans has been chosen to minimise the overall construction depth and lessen the depth of the bypass passing under Lodge Lane. The abutments and pier would be formed using bored piles working from ground level and would be topped by reinforced concrete pile caps. The bridge deck would comprise precast concrete beams with an in-situ reinforced concrete deck and parapets. The deck would provide for the diversion of utilities apparatus.

Lodge Lane Cutting Retaining Walls

4.4.10 The higher (western) sections of the retaining walls would be formed using bored piles working from ground level and would be topped by reinforced concrete pile caps. The lower (eastern) sections of the retaining wall may be formed using precast concrete units to allow for speedy installation.

Grange Footbridge

4.4.11 The footbridge would comprise a single span steel truss across the bypass with gently sloping ramps (1 in 20) and steps on both sides of the bypass. The bridge supports would be steel columns supported on concrete foundations. The bridge would be built away from Garstang New Road and would not affect traffic on that road or utilities apparatus.

4.5 Highways Drainage

4.5.1 All new highway drainage would be designed and constructed to meet the requirements of DMRB Volume 4, Section 2, Part 3, HD 33/06 Surface and Sub-Surface Drainage Systems for Highways. This standard requires that sealed carrier drains must be designed for a return period of 1 year without surcharge. The design is also checked against a 5-year storm intensity to ensure surcharge levels do not exceed the levels of chamber covers.

4.5.2 Highway surface water drainage would be drained slip formed concrete surface water channel along the bypass but kerbs and gulleys at the junctions. New sections of full depth carriageway would receive sub-surface drainage where applicable.

4.5.3 The current proposal to discharge surface water from the Scheme is to utilise existing outfalls where possible. Any existing catchments unaffected by the Scheme would be unaltered, whilst flows from existing roads would have attenuation and treatment on a 'nil detriment' basis.

4.5.4 Runoff from new roads would be attenuated up to the 100 year (+30%) event at approved greenfield runoff rate of 11.9l/s/ha (litres per second per hectare) through the construction of the new wetlands.

4.5.5 Any existing highway drainage networks severed by the Scheme would be either connected into the proposed drainage network or diverted accordingly.

4.5.6 Penstocks would be installed upstream and downstream of each attenuation pond to allow isolation in case of a spillage within the catchment. In addition, bypass oil interceptors would be installed upstream of the ponds.

4.5.7 Existing field ditches would be retained or diverted as part of the bypass construction and these are located at Ch.1135, Ch.1495, Ch.1795, Ch.2005, Ch.2500, Ch. 4305 and Ch. 4360 crossing the bypass through new or extended culverts. The new culverts would be 1.5m diameter except that at Ch.2500 that would be 1.2m diameter with provision to allow mammals such as otters to pass through the culverts.

4.5.8 The highway wetland areas would be constructed to provide storage, containment and treatment of water run-off from the bypass. These would be provided at Ch.1610, Ch.2340, Ch.4150 and Ch.4400. These wetland areas would discharge into adjacent watercourses.

4.6 Highways Lighting

4.6.1 Lighting along the Scheme is only proposed at the following junctions and their approaches:

- Skippool Junction through to Skippool Bridge Junction
- Poulton Junction
- Windy Harbour Junction
- Little Singleton Roundabout

4.6.2 The lighting would be mounted on 12m high columns (same height as existing columns along the A585) located at the back of verges or footways. Lighting would be provided by LED directional lanterns that would minimise light spill light pollution which can cause sky glow and light trespass onto neighbouring properties as well as minimising adverse landscape and ecological effects.

4.6.3 In addition, the lighting would be provided with the facility to be part-night dimmed or part-night switched off via a central management system or photo-electric control units.

4.6.4 No lighting is proposed on the dual-carriageway link sections between Skippool Bridge Junction and Poulton Junction, and between Poulton Junction and Windy Harbour Junction.

4.7 De-Trunking

4.7.1 De-trunking of the existing A585 would be undertaken as part of Scheme. The whole of the existing A585 road would be retained between Skippool Bridge and

Windy Harbour and, by agreement, would be taken over by the local highway authority - Lancashire County Council.

4.8 Non-Motorised User (NMU) Provision

4.8.1 It is not proposed to include specific provision for pedestrians and cyclists along the off-line sections of the bypass as it is considered that improvements to the facilities along the existing roads would better serve the expected demand between communities.

4.8.2 Where the proposed route would affect the existing footways and cycleways along the existing A585 and the Public Rights of Way (PRoW) network measures would be developed to ensure the route is available at all times during construction and the design would be developed to accommodate use of the footpaths in the Scheme. Two footpath routes are affected by the Scheme.

4.8.3 Footpath 2 (Singleton) crosses the bypass route about 1km west of Windy Harbour Junction and a footbridge (Grange Footbridge) over the bypass is proposed as the permanent solution. During construction, a safe route thorough the construction site would be provided

4.8.4 Footpath 1 (Poulton) becomes Footpath 11 (Singleton) and joins the existing A585 at Skippool running alongside the western bank of Main Dyke. It then joins Footpath 6 (Singleton) via Old Mains Lane on the north side of the A585. The permanent solution to link the footpaths would be to provide a short diversion at the south-west corner of the proposed New Skippool Bridge and then to use the pedestrian crossing facilities of the proposed Skippool Bridge Junction. During construction, a safe route using the existing and proposed footways within the construction site would be provided.

4.8.5 The recreational route “Wyre Way” that runs along the banks of the River Wyre is only close to the Scheme where it crosses the culvert carrying Horsebridge Dyke immediately north of Skippool Roundabout. The works may affect access over a 10m length of the route during construction and a temporary diversion would be provided along Wyre Road, Skippool Road and the north footway of Breck Road.

4.8.6 Additional cycleway / footway crossing provisions would be provided at the junctions. Improvements would also be made to the existing Mains Lane and Garstang New Road as part of de-trunking and decommissioning respectively.

4.9 Construction

4.9.1 Construction is anticipated to last for approximately 2 years and commence in Spring 2020. Construction staging would be determined by the Contractor in detail, however, the following paragraphs present possible arrangements during construction. Further detail can also be found at Appendix 2.1: Construction Information (document reference TR010035/APP/6.2.1 and the draft Traffic Management Plan (document reference TR010035/APP/7.5).

4.10 Skippool Bridge

4.10.1 The construction of the new Skippool Bridge would be undertaken in 2 stages. Initially the northern section of the new bridge would be constructed offline (north of the existing bridge) while traffic would remain on the existing road.

4.10.2 After the existing utilities apparatus has been disconnected, the existing bridge over Main Dyke would be demolished and the southern half of the new bridge

would be constructed approximately at the location of the existing bridge.

4.11 Construction Compounds

4.11.1 For the western (Skippool) section a site compound is proposed on the north side of Breck Road at about Ch.370 to Ch.470.

4.11.2 A main compound is proposed on the north-east side of the proposed Poulton Junction with access off A586 Garstang Road East (around Ch.2100 to Ch 2300).

4.11.3 A further compound is proposed on the south-west side of the proposed Poulton Junction with access off A586 Garstang Road East (around Ch. 2150 to 2450).

4.11.4 For the eastern (Little Singleton) sections of the Scheme it is proposed to have site a compound around Ch.3600 to Ch.3700. This would allow site vehicles to come from the Windy Harbour junction and access the offline haul road. The site compounds would be used for plant and material storage and welfare facilities for staff and would include:

- Strip of topsoil (set aside for re-topsoiling) and then build up with stone / crushed concrete
- Hoarding or security fencing around the perimeter
- Screen mounding where required for the benefit of neighbouring properties
- Bunds around fuel tanks to contain spillages
- Various temporary office and welfare
- Security lighting normally with mains power but silenced generators may be required if no mains power supply is available locally.

4.12 Haulage Routes and Construction Traffic Management

4.12.1 Access for construction vehicles to and from the site would be primarily from the trunk road network and other designated routes that would be clearly signposted. The likely routes are shown in green on Insert 7-1. Construction traffic over 7.5 tonnes would be prohibited from using the routes shown in red but construction traffic less than 7.5 tonnes would be permitted to use the routes shown in yellow. Those yellow routes would also be available for construction traffic in the event of a blockage on the designated routes.

4.12.2 Further detail on traffic management can be found in the draft Traffic Management Plan (document reference TR010035/APP/7.5).

4.13 Decommissioning

4.13.1 The traffic and economic assessment demonstrates that the proposed improvements would operate adequately for the 15 year design life of the Scheme until 2037. Typically, highway schemes are designed to have a material life-span of between 20 and 40 years before major maintenance and upgrading is required dependent on material properties, maintenance and usage. Elements including structural concrete and steelwork for bridges and retaining wall have extended design lives of up to 120 years.

4.13.2 It is considered highly unlikely that the junction and link road would be decommissioned after the various design life's listed as the road is likely to have become an integral part of the infrastructure in the area. Therefore, full

decommissioning of the road scheme would not be either feasible or desirable.

4.13.3 However, various assets of the Scheme would be repaired or replaced as they approach their normal design life, for example:

- Road surfacing would be removed and replaced after between 10 to 20 years with the removed material being recycled
- Steel safety fence would be replaced after typically 25 years and would be recycled offsite
- Lighting columns, road signs and traffic signals would be replaced after between 25 and 30 years and would be recycled offsite
- Electrical cables for lighting, signs and traffic signals would be replaced after typically 30 years and would be recycled offsite
- Drains, chambers and culverts may need repairs after 40 years but these would normally not require full replacement

4.14 Traffic Forecasting

4.14.1 Traffic forecasts undertaken for the Core Scenario would be used as the primary basis of evidence for the Scheme. The A585 model validation base year is 2015 and the proposed model forecast years would be:

- Opening year of 2022
- Design year of 2037

4.14.2 Future year traffic flows have been extracted from the model for the purposes of the different environmental assessment topics, for example, Air Quality, Noise and Vibration.

4.15 Embedded Design

4.15.1 The Scheme design is an iterative process and takes into consideration key significant effects on environmental receptors and the mitigation proposed. During the options phase, the Scheme was designed to minimise its impact on the local environment, for example through minimising the number of structures over watercourses.

4.15.2 DMRB suggests design measures, which can be incorporated within highways design, to mitigate impacts arising from highways development. Environmental measures embedded into the design of the Scheme are outlined in Section 7.3.

5 BASELINE ENVIRONMENT

5.1 Introduction

5.1.1 Further data gathering, in the form of dedicated field surveys, was required to gain a more detailed understanding of the use of land in proximity to the Scheme options by qualifying bird species associated with the nearby Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site.

5.1.2 Following consultation and agreement with Natural England via email exchanges in late summer 2016, field surveys commenced in September 2016. The detailed bird survey methodologies and results are described in the Bird Survey Report within Appendix 3 of this Report. A summary of the methodology and findings is presented below.

5.2 Survey Area

5.2.1 The survey area was defined by the potential impact pathways on ornithological receptors, and by the distance over which impacts might be experienced by birds utilising habitats which could be functionally-linked to the nearby Morecambe Bay and Duddon Estuary SPA and the Morecambe Bay Ramsar site (i.e. as far as the likely extent of biophysical change associated with the Scheme).

5.2.2 The survey area (hereafter referred to as the 'Bird Survey Area') represents an approximate 500m buffer from the Scheme. In addition to this, data was also collected over a wider area to the north when other route options were previously considered in 2016/17. Also, an area to the south west was surveyed as being potentially suitable in case land were required for mitigation. Following these surveys, it was determined that this area to the south west would not, in fact, be appropriate for mitigation land.

5.2.3 Due to the large extent of the Bird Survey Area, the land was split into 6 distinct areas. Only areas where suitable habitat was present were surveyed. Suitable habitat was identified through a review of Ordnance Survey (OS) mapping and online aerial imagery. The 6 Bird Survey Areas are shown on Figure 1, in Appendix 1. In addition, to provide further spatial information, each of the 6 Bird Survey Areas were divided into smaller land parcels. The land parcels within each Bird Survey Area are detailed in Table 1 and are also shown on Figure 1, in Appendix 1.

Table 1: Land Parcels

Bird Survey Area	Land Parcel Number
1	1, 2, 3, 4, 5, 6
2	7, 8, 9, 10, 11
3	12, 13, 14, 15, 16
4	17, 18, 19, 20, 21
5	22, 23, 24, 25
6	26, 27, 28, 29

5.3 Methodology

5.3.1 The field surveys were undertaken as detailed in Table 2. The detailed survey methodology is presented in Section 2 of Appendix 3.

Table 2: Field Survey Effort and Timings

Survey	Survey Effort
Transect surveys (Autumn passage)	Weekly daytime visits between mid-September to November during the autumn passage period in 2016 and 2017.
Transects and dawn and dusk surveys (Winter)	Two daytime surveys and 1 dawn or dusk survey per month October 2016 – March 2017 and October 2017 – March 2018 throughout the period that overwintering geese are active.
Transects (Spring)	Weekly daytime visits between March to mid-May in both 2017 and 2018 during the spring passage period.
Transects (Breeding)	One breeding bird survey visit per month April – June 2017.

5.4 Results

5.4.1 The detailed bird survey results are presented in Section 3 of Appendix 3 and summarised below.

Winter / passage (individual qualifying species)

5.4.2 Sixteen Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site qualifying species (designated for peak counts during the winter, on passage or both) were recorded during the passage and winter bird transect surveys between 2016 and 2018. These species comprised: pink-footed goose, lapwing, curlew, little egret, shelduck, oystercatcher, redshank, lesser black-backed gull, dunlin, black-tailed godwit, knot, cormorant, red-breasted merganser, wigeon, ringed plover and golden plover. Detailed species accounts for each of these 16 species are presented in Section 3.3 of Appendix 3.

5.4.3 Table 3 provides details of the peak counts for the 16 Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site qualifying species recorded during the winter and passage bird surveys (combining the transect and dawn and dusk survey results).

5.4.4 Table 3 shows the peak count of birds recorded on the ground on each survey date (i.e. birds utilising the habitats within the Bird Survey Area that could be affected by the Scheme). The table is also split by the 6 Bird Survey Areas (described in paragraph 5.2.3 and shown on Figure 1, in Appendix 1) to show where the birds have been recorded to provide spatial context to the data.

Table 3: Peak Count of Foraging / Roosting Birds Recorded During Passage and Winter Surveys

Species	Qualifying feature	Area	Peak Count on Ground (Peak count in flight is included in brackets where greater than on ground only; numbers in bold represent 1% or greater of the SPA/Ramsar site population)															
			September		October		November		December		January		February		March		April	
			2016	2017	2016	2017	2016	2017	2016	2017	2017	2018	2017	2018	2017	2018	2017	2018
Pink-footed goose	Winter/ passage	1					8		**3,400**		90				1	6		
		2		70		41			**1,500**	60	**500**	**160**		**600**				
		3	1			**530**			**165**		**300**	**400**				18		**475**
		4									**800**	**2,500**						
		5										134						
		6				**267**		100	**165**		**300**			55		**7,500**		
Lapwing	Ramsar site qualifying feature only (winter)	1			100		90		1		40		52	**350**	54		**280**	2
		2					1	4	9			50					35	1
		3	100		**257**	146	48		150	20	45	**250**	**320**					
		4	**800**	26	126		**530**	11	7	3	**450**	82	**200**		1		2	1
		5	35	45	24	**320**	10	7	2	**200**	55	5		3				
		6	16	420	**240**	**253**	120	615	**800**	**668**	**600**	**700**	35	**200**		40	20	
Curlew	Winter/ passage	1			11		124		46	7								
		2	1		6		29								7	7		
		3	14	17	45	14	8		**180+**	3	5		53		1	45	15	10
		4	15	10	5		37		1		1		30	45	10	47	17	14
		5	15		8	2	38	5	1	**120**		1				4		18
		6	35	45	30	132	40	6		**201**	40	**400**	100+	150	63	50	64	20
Little egret	Winter	1													**1**	**1**	**2**	
		2							**7**					**1**	**1**	**1**		
		3	**5**		**1**		**2**					8			**1**	**1**	**1**	
		4	**9**	**7**			**1**			**1**	**1**		**1**		**3**		**2**	
		5				**3**		**3**	**2**	**3**	**1**	**1**			**5**	**1**	**3**	
		6	**11**	**9**	**3**	**9**	**2**	**1**		**5**	**1**				**1**	**1**	**1**	**3**
Shelduck	Winter/ passage	1													9	2	2	2
		2													1		4	5
		3	1		6					5		5	10		4	4	3	7
		4											1		2	3	2	4
		5								4		2	2		4	2	2	7
		6			4	2	11	42		15		70	2	79	7	11	15	6
Oystercatc-her	Winter passage	1													2	2	3	2
		2													3	2	2	2
		3									1				7	2	5	4
		4			35										2	2	3	4
		5						1							2	2		2
		6					11			5			21	1	2	8	2	7
Redshank	Winter/ passage	1						1	71						51	5		1
		2																
		3	2		20	2	12		2	45	4	34	4		22	8	7	7
		4	30	1	55	50	33	2	21		52		1		12	8	10	2
		5												1		7		
		6	32	42	5	72	11	24	3	120	2	25		30	8	24	28	43

Species	Qualifying feature	Area	Peak Count on Ground (Peak count in flight is included in brackets where greater than on ground only; numbers in bold represent 1% or greater of the SPA/Ramsar site population)															
			September		October		November		December		January		February		March		April	
			2016	2017	2016	2017	2016	2017	2016	2017	2017	2018	2017	2018	2017	2018	2017	2018
Lesser black-backed gull	Winter/ passage	1	5		6	3	1		2			1			5		1	25
		2													2	2		7
		3	3		5				2		1				4	4		
		4	22	1		7	1	1			3	1	5		40	16	36	10
		5	3				3						1		1		2	12
		6	**130**	85	10	20	1	8		5	20	0	2	3	5	30	15	20
Dunlin	Winter/ passage	1																
		2																
		3																1
		4	27		15		34		33									
		5																
		6		9	15			6		50		30		250	1	**400**		
Black-tailed godwit	Winter/ passage	1							6									
		2																
		3																1
		4														1		
		5												5				
		6																73
Knot	Winter/ passage	1																
		2																
		3																
		4	1															
		5																
		6	170															
Cormorant	Ramsar site qualifying feature only (passage)	1									1							
		2											1	2	3	1		
		3	3		3	3		3	1	13			6	12	1	6	3	
		4	8		1							1			2	1	1	
		5									1		2		4		3	
		6	3		2		5		2	1	1	1		7	1	1	2	
Red-breasted merganser	Winter/ passage	1																
		2																
		3			2													
		4												1				
		5																
		6																
Wigeon	Winter/ passage	1							60									
		2																
		3			35					60		5						
		4															2	
		5				6		6										
		6		28		**76**	20	**109**	20	**63**		**67**		20		**140**		
Golden	Winter/	1												70				

Species	Qualifying feature	Area	Peak Count on Ground (Peak count in flight is included in brackets where greater than on ground only; numbers in bold represent 1% or greater of the SPA/Ramsar site population)															
			September		October		November		December		January		February		March		April	
			2016	2017	2016	2017	2016	2017	2016	2017	2017	2018	2017	2018	2017	2018	2017	2018
plover	passage	2																
		3																
		4	**200**			**140**												
		5										3						
		6		**170**	**32**	**397**				**250**		**250**		**100**				
Ringed plover	Winter/ passage	1																
		2																
		3					1											
		4																
		5																
		6					1											

5.4.5 It is normally considered by Statutory Nature Conservation Bodies (SNCBs) that if an area of land regularly and frequently supports 1% or greater of the total of the SPA/Ramsar site qualifying species population, then this is considered to be significant (Young and Shackleton, 2007). Consultation with Natural England has confirmed that the figure of 1% or greater is appropriate for this assessment (as per the meeting of 15 December 2015). The peak counts that are highlighted in bold in Table 4 show where 1% or greater of the Morecambe Bay and Duddon Estuary SPA or Morecambe Bay Ramsar site population has been recorded.

5.4.6 The 1% thresholds have been taken from the 5-year peak means 2009/10–2013/14 for the Morecambe Bay and Duddon Estuary SPA citation, which is the most recent data for the region, and is considered the most appropriate numbers to use. Table 4 shows the 5-year peak means 2009/10–2013/14 for the Morecambe Bay and Duddon Estuary SPA citation populations, and the 1% threshold used in Table 4. The Morecambe Bay Ramsar site population figures have also been included in Table 4 where the species is a qualifying species of the Ramsar site only. The most recent figure for Morecambe Bay from British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) information (Frost *et al.*, 2017) has also been included in the table to provide an indication of the most recent population figures for the area. However, it should be noted that these figures are for Morecambe Bay only, and do not cover the wider newly formed combined Morecambe Bay and Duddon Estuary SPA.

Table 4: Qualifying Species Population and 1% or Greater Threshold

Species	Morecambe Bay and Duddon Estuary SPA population (2009/10–2013/14)	Ramsar site population (1998/9-2002/3)	1% or greater threshold of the population	BTO WeBS Morecambe Bay population (2012/13–2016/17)
Pink-footed goose	15,648	3,665	156	25,490
Lapwing	N/A	16,492	165	18,440
Curlew	12,209	20,018 (passage)	122	11,193
Little egret	134	N/A	1	154
Shelduck	5,878	7,032 (passage)	59	4,228
Oystercatcher	55,888	66,577 (passage)	558	40,437
Redshank	11,133	N/A	111	8,411

Species	Morecambe Bay and Duddon Estuary SPA population (2009/10–2013/14)	Ramsar site population (1998/9-2002/3)	1% or greater threshold of the population	BTO WeBS Morecambe Bay population (2012/13–2016/17)
Lesser black-backed gull	9,450	4,093 (passage)	94	6,884
Dunlin	26,982	26,416	269	17,761
Black-tailed godwit	2,413	N/A	24	2,798
Knot	32,739	66,335	327	20,085
Cormorant	N/A	967 (spring/autumn)	9	1,024
Red-breasted merganser	N/A	327	3	132
Wigeon	N/A	6,133	61	8,477
Ringed plover	1,049	1,041 (passage)	10	1,153
Golden plover	1,900	4,073 (wintering)	19	3,604

Overwintering and Seabird Assemblage

5.4.7 Birds which could make up the overwintering waterbird assemblage associated with Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site were also recorded throughout the winter surveys. A total of 41 species were recorded during the 2016–2017 surveys, and a total of 33 species were recorded during the 2017–2018 winter bird surveys, refer to

5.4.8 Table 5. Further details of the overwintering waterbird assemblage are provided in Section 3.3 of Appendix 3.

Table 5: Overwintering Waterbird Assemblage Species Recorded During the Bird Surveys

Species			
Barnacle goose	Golden plover	Lesser black-backed gull	Redshank
Bittern	Goosander	Little egret	Ringed plover
Black-headed gull	Great black-backed gull	Little grebe	Shelduck

Species			
Black-tailed godwit	Green sandpiper	Mallard	Shoveler
Canada goose	Greenshank	Manx shearwater	Snipe
Common gull	Grey plover	Mediterranean gull	Teal
Coot	Greylag goose	Moorhen	Whimbrel
Cormorant	Herring gull	Mute swan	White-fronted goose
Curlew	Jack snipe	Oystercatcher	Whooper swan
Dunlin	Kingfisher	Pink-footed goose	Wigeon
Gadwall	Knot	Pintail	Woodcock
Goldeneye	Lapwing	Red-breasted merganser	Yellow legged gull

5.4.9 Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site are also designated for supporting an important seabird assemblage during the breeding season. The majority of birds which would constitute the seabird assemblage are associated with marine and coastal habitats to the north of the Scheme. Only 2 species associated with the seabird assemblage were recorded during the bird surveys, these comprised herring gull and lesser black-backed gull, described below.

Breeding

5.4.10 Two Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site qualifying species were observed during the 2017 breeding bird transect surveys (herring gull and lesser black-backed gull). These species are also a constitute of the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site seabird assemblage.

5.4.11 Table 6 shows the peak counts for herring gull and lesser black-backed gull. Neither species were recorded in numbers greater than 1% of the SPA/Ramsar site populations (individually, or as part of the seabird assemblage). Detailed accounts for both species are presented in Section 3.4 of Appendix 3.

Table 6: Peak Count of Qualifying Species During Breeding Bird Surveys

Species	Qualifying feature	Peak count		
		April	May	June
Herring gull	Qualifying feature of Morecambe Bay and Duddon Estuary SPA/Criterion 6 Ramsar site species (during breeding season) Also, part of the seabird assemblage qualification for Morecambe Bay and	13 (dusk)	3 (dawn)	1 (dawn)
Lesser		7	5	22

Species	Qualifying feature	Peak count		
black-backed gull	Duddon Estuary/ Morecambe Bay Ramsar site	(dusk)	(dawn)	(dawn)

6 HRA SCREENING FOR THE SCHEME

6.1 Introduction

6.1.1 Screening is a relatively high-level filter to identify those sites and features for which likely significant effects cannot be ruled out in isolation or in combination with other projects or plans. It is an on-going process which reflects the data available at the time of the assessment. The results of the screening exercise have been used to inform the AA (included in this Report within Section 7). The screening process involved firstly screening the European sites to determine which sites could be affected. Following this the qualifying features of relevant European sites were screened for potential to be affected and finally the potential impacts upon designated features were screened for likely significant effects as a result of the Scheme. Where the potential for likely significant effects could not be screened out, further AA has been undertaken.

6.2 Identification of European Sites

6.2.1 In addition to the previously outlined legislative requirements, whereby all European sites that may be affected by a Scheme should be assessed within the HRA (no matter how distant from the Scheme), the DMRB (HD44/09) states that: '*consideration should be given to any European sites within 2km of the route corridor/project boundary and in addition, consideration should also be given to any European Sites within 30km, where bats are noted as a qualifying interest*.' On a precautionary basis, European sites within 10km were also assessed for their potential to be affected by the Scheme.Table 7, below, shows the European sites identified in these search areas. The location of the Scheme, in the context of nearby European sites, is shown on Figure 2, Appendix 1.

6.2.2 Note that the River Wyre is also a proposed Marine Conservation Zone (MCZ). Section G.2.3 of the DTA Guidance (DTA, June 2016) states that:

'It is important to note that the Habitats Regulations Assessment process, as a matter of law and policy, only relates to Marine Protected Areas [including MCZs], or part of them, which are designated as SACs, classified as SPA's or listed as Ramsar sites, or to the extent that they are being brought forward for designation, classification or listing… In other words, they only apply where the designated 'qualifying feature(s) is of international importance. If a plan or project only affects the interest features of a MCZ or a SSSI, and does not affect the qualifying features of a European Marine Site or Ramsar site, the Habitats Regulations will not apply'

6.2.3 The qualifying feature of the River Wyre pMCZ is smelt (*Osmerus eperlanus*). This species is not a qualifying feature of any of the designated sites considered in this assessment. Further consideration of the pMCZ is therefore not required as part of the HRA for the Scheme. A separate MCZ screening assessment has been prepared and submitted to the Marine Management Organisation as part of the Marine Licence application. Note: the only element of the Scheme considered to be 'marine works' is the replacement of Skippool Clough culvert which involves demolishing and replacing the north headwall located above the mean high-water springs.

Table 7: European Sites Identified in the Vicinity of the Scheme

Name of Site	Identification Number	Distance from Scheme boundary (approximate km)
European Sites within 2km		
Morecambe Bay and Duddon Estuary SPA (JNCC, 20107)	UK9020326	0.3km
Morecambe Bay Ramsar site (JNCC, 2017)	UK11045	0.3km
European Sites within 10km		
Morecambe Bay SAC (JNCC, 2017)	UK0013027	8km
Ribble and Alt Estuaries SPA (JNCC, 2017)	UK9005103	10km
Ribble and Alt Estuaries Ramsar site (JNCC, 2017)	UK11057	10km
Liverpool Bay SPA (JNCC, 2017)	UK9020294	6km
Shell Flat and Lune Deep SAC (JNCC, 2017)	UK0030376	9km
European Sites within 30km (where bats identified as qualifying feature)		
No sites		

6.3 Screening of European sites

6.3.1 Whilst there would be no direct impacts upon the features of any of the designated sites themselves, there is the potential for indirect impacts upon the mobile species associated with the sites, or through pollution/air quality effects. The screening stage therefore takes into consideration the potential pressures / threats to each of the European sites to help determine whether the sites can be screened in, or out of further assessment. Each of the European sites is discussed in detail below.

Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site

6.3.2 Morecambe Bay and Duddon Estuary SPA (JNCC, 2017) and Morecambe Bay Ramsar site (JNCC, 2017) are important sites for wintering and migratory waders and wildfowl along the east Atlantic flyway from breeding grounds in the Arctic. The Bay also supports important breeding grounds for seabirds.

6.3.3 There are 16 potential pressures / threats which have been identified for these European sites within the Site Improvement Plan (SIP) for Morecambe Bay (Natural England, 2014). The potential pressures/ threats relevant to this assessment would comprise: air pollution, water pollution, public access /

disturbance and changes in species distribution. All other potential pressures / threats (including inappropriate pest control (associated with protection of gull colonies at South Walney, Foulney and Chapel Island (also Eider ducks) where breeding success has been adversely affected by predation by foxes, badgers and rats), invasive species (associated with non-native species such as Japanese Rose encroaching upon sand dunes around Barrow in Furness, and Pacific Oyster within Walney Channel), fisheries (commercial and aquaculture), biological resource use (related to grazing needs within the SAC to prevent scrub encroachment), changes in land management (associated with management of the dune habitats on North Walney), hydrological change (associated with Roosecote power station shutdown), physical modification (in relation to changes to salt meadow habitats through de-silting and drain clearance), energy production (associated with new energy schemes within Morecambe Bay) and direct impact from 3rd parties (associated with egg collectors)) have been screened out of further assessment. The construction of the new A585 road Scheme would have no effect on these other potential pressures/ threats associated with the European sites. Supplementary Advice for the Morecambe Bay and Duddon Estuary SPA (Natural England, 2019) also provides details of attributes which need to be protected in order for the Conservation Objectives of the SPA to be achieved. The attributes which are considered relevant to this assessment include connectivity with supporting habitats (i.e. functionally linked land), disturbance caused by human activity and attributes associated with supporting habitats such as vegetation characteristics for feeding and roosting, food availability and its extent and distribution.

Air Quality

6.3.4 The SIP (Natural England, 2014) states that, 'Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site.' Air quality assessments have been undertaken as part of the Environmental Statement for the Scheme, refer to Chapter 6.6: Air Quality (document reference TR010035/APP/6.6).

6.3.5 In relation to the construction phase of the Scheme, it is not anticipated that airborne pollutants and/or dust arising from construction activities and vehicles using the access routes, or vehicle movements during the construction phase of the Scheme, would give rise to any likely significant effects on the qualifying features of the SPA/Ramsar site. Current air quality guidance suggests that any construction sites or routes used by construction vehicles within 50m of a designated site; and the presence of any European site within 200m of the main access roads used by HGVs accessing the site could lead to likely significant effects on the European site during the construction phases of new development. The construction works would be more than 200m from the edge of the SPA/Ramsar site at its closest point, with the majority of the construction works more than 500m from the Scheme (i.e. beyond the 50m threshold). The access routes for construction traffic would use the M55, the existing A585, A586, A588, A587 and A583, all of which are more than 250m from the SPA/Ramsar site at its closest point (refer to Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2), and therefore outside of the 200m buffer. Measures to protect air quality, such as dust suppression, are set out within the Record of Environmental Actions and Commitments (REAC) (document reference

TR010035/APP/7.3 – Rev 1) to ensure compliance with current air quality standards for construction sites. However, regardless of these standard measures, there would be no likely significant construction phase air quality impacts on Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site as a result of the Scheme.

6.3.6 With regards to the operational phase of the Scheme, the completed road would be 280m from the SPA/Ramsar site, with the majority of the new road more than 500m away. The air quality assessment (Chapter 6.6: Air Quality (document reference TR010035/APP/6.6)) shows that the SPA / Ramsar site is outside of the 200m buffer surrounding the affected road network, and therefore there would be no likely significant operational phase air quality impacts on Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site.

6.3.7 Potential impacts on Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site associated with air quality as a result of the Scheme have been **screened out** of further assessment.

Water Quality

6.3.8 The SIP (Natural England, 2014) states that 'Diffuse pollution and/or uncontrolled release of pollutants from terrestrial sources could alter or damage the habitats and species found within the estuary'.

6.3.9 The water quality assessments undertaken as part of the Environmental Statement for the Scheme identified the potential for negative effects on water quality of the River Wyre and its associated tributaries, due to receipt of construction site runoff and potential for reduced flow conveyance capacity (particularly on the Main Dyke) due to sedimentation (refer to Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12). No works would take place within the SPA / Ramsar site itself, therefore, there would be no direct impacts on the European sites. However, further assessment is required as to whether the Scheme would lead to any likely significant indirect effects, in terms of water quality, on the qualifying features of the Morecambe Bay Ramsar site or the Morecambe Bay and Duddon Estuary SPA.

6.3.10 This potential impact has been **screened in** to the AA.

Qualifying Bird Species

6.3.11 Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site support internationally important numbers of waterfowl and waders. The SPA and Ramsar sites extend into the River Wyre in the vicinity of the Scheme (refer to Figure 2, Appendix 1). No works would take place within the SPA/Ramsar site itself, therefore, there would be no direct impacts on the European sites. However, given the close proximity of the SPA and Ramsar site to the Scheme (300m away at its closest point), further assessment is required as to whether the Scheme would lead to any likely significant indirect effects on the qualifying features of the Morecambe Bay Ramsar site or the Morecambe Bay and Duddon Estuary SPA.

Summary

6.3.12 The Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site have been **screened in** for further assessment, but only in relation to potential impacts on qualifying bird species and potential effects associated with water quality.

6.3.13 All other potential impacts have been **screened out** of further assessment.

Morecambe Bay SAC

6.3.14 Morecambe Bay SAC (JNCC, 2017) consists of large shallow inlets and bays and intertidal mudflats and sandflats, glasswort and other annuals colonising mud and sand, saltmarshes, sand dunes and vegetated shingle communities. The SAC is located 8km away from the Scheme at its closest point; and as such, there would be no likely significant effects on the habitats for which the site is designated. Although great crested newts have been identified within the Scheme, the population of great crested newts associated with the SAC are located on the southern shore of the Duddon Estuary (more than 30km from the Scheme) and would not be affected by the Scheme.

6.3.15 The SIP for Morecambe Bay (Natural England, 2014) identifies 16 potential pressures/threats to the European site, and the Supplementary Advice Document identifies a number of attributes which need to be protected in order for the Conservation Objectives of the SAC to be achieved. The potential pressures/threats relevant to this assessment, which have the potential to impact on achievement of the Conservation Objectives of the SAC, would comprise: air pollution and water pollution. All other potential pressures / threats have been screened out of further assessment (as detailed in paragraph 6.3.3 above).

Air Quality

6.3.16 As outlined above, the SIP (Natural England, 2014) states that 'Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site.' Air quality assessments undertaken as part of the Environmental Statement (Chapter 6.6: Air Quality document reference TR010035/APP/6.6) for the Scheme confirms that, given the distance of the Scheme from the SAC, there would be no likely significant effects on the qualifying features of the SAC associated with air quality and the Scheme during the construction or operational phases.

6.3.17 Given the distance of the Scheme from the boundary of the SAC (8km away), potential impacts on Morecambe Bay SAC associated with air quality have been **screened out** of further assessment.

Water Quality

6.3.18 As outlined above, the SIP (Natural England, 2014) states that 'Diffuse pollution and/or uncontrolled release of pollutants from terrestrial sources could alter or damage the habitats and species found within the estuary'. The water quality assessments undertaken as part of the Environmental Statement for the Scheme identified the potential for negative effects on water quality (of the River Wyre and its associated tributaries, which flow into the SAC), refer to Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12). However, given the distance of the SAC from the Scheme, and the fact that Morecambe Bay already experiences extremely high background sediment inputs, the water quality assessment concluded that there would be no likely significant adverse impacts associated with potential pollution pathways as a result of the construction phase of the Scheme. This potential impact can therefore be **screened out** of further assessment.

Summary

6.3.19 Due to the distance of the SAC and its qualifying features from the Scheme, potential impacts on Morecambe Bay SAC have been **screened out** of further assessment.

Ribble and Alt Estuaries SPA and Ramsar site

6.3.20 The Ribble and Alt Estuaries (JNCC, 2017) support internationally important populations of breeding and wintering seabirds, wildfowl and waders on the north west coast of England.

6.3.21 There are 13 potential pressures/threats which have been identified for this European site within the SIP for Sefton Ribble (Natural England, 2014), and the Supplementary Advice identifies the attributes which need to be protected in order for the Conservation Objectives of the SPA to be achieved. The potential pressures/threats relevant to this assessment would be associated with potential impacts (such as protecting roosting and feeding areas, and maintaining population numbers, as set out within the Supplementary Advice and disturbance to bird populations as set out within the SIP) on the waterbird assemblage associated with the site. The population of natterjack toad associated with the Ramsar site are located more than 10km from the Scheme and would not be affected by the Scheme. All other potential pressures / threats listed in the SIP (including coastal squeeze (associated with erosion at Formby Point), air quality (associated with the dune habitats more than 20km from the Scheme), inappropriate scrub control (associated with scrub encroachment on the dune slacks), invasive species (associated with encroachment of non-native vegetation within the dune habitats and non-native marine species in Liverpool Docks and the Dee Estuary), hydrological change (in relation to water availability on the dune system), inappropriate coastal management (associated with parking on Ainsdale Beach and stabilisation of the coast at Crosby), fisheries (commercial), change to site conditions (in relation to erosion and retreat of the dune system), and shooting/scaring (associated with consented culls of herring gull and lesser black-backed gull on the Ribble Estuary)) have been screened out of further assessment. The construction of the new A585 road Scheme would have no effect on these other potential pressures/ threats associated with the European sites.

Qualifying Bird Species

6.3.22 The Ribble and Alt Estuaries SPA (JNCC, 2017) and Ramsar site (JNCC, 2017) is 10km from the Scheme, and therefore within the foraging ranges of qualifying species such as pink-footed geese, lapwing and golden plover. It was agreed with Natural England that, providing there are no impacts from the Scheme which lead to an effect upon the integrity of the Morecambe Bay and Duddon Estuary SPA (JNCC, 2017) and Morecambe Bay Ramsar site (JNCC, 2017), it would inevitably confirm that potential impacts associated with the Ribble and Alt Estuaries SPA and Ramsar site would also not be significant or affect the integrity of the sites. The AA of the Scheme (refer to Section 7) determined that there would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA/Morecambe Bay SPA (with mitigation in place). Therefore, the Ribble and Alt Estuaries SPA and Ramsar site have been **screened out** of further assessment.

Liverpool Bay SPA

6.3.23 Liverpool Bay covers a large area from low water to approximately 20km offshore in the Eastern Irish Sea, extending from Anglesey in Wales to Blackpool in England. It is classified (JNCC, 2017) to protect common scoter and red throated diver (which forage exclusively at sea or around coastal areas). The site also protects the habitats that support these species.

6.3.24 There are 6 potential pressures/threats (including fisheries (commercial), transportation and service corridors, fisheries (recreational), extraction (non-living), siltation and water pollution) which have been identified for this European site within the SIP for Liverpool Bay (Natural England, 2015) and the Supplementary Advice identifies the attributes which need to be protected in order for the Conservation Objectives of the SPA to be achieved. However, given the distance of Liverpool Bay SPA from the Scheme (approximately 6km), and the fact that the qualifying birds are exclusively marine species, there are no elements of the Scheme which could give rise to likely significant effects on the qualifying features of the SPA, or add to the potential pressures/threat and impacts identified in the SIP and Supplementary Advice Document.

6.3.25 Potential impacts on the Liverpool Bay SPA have therefore been **screened out** of further assessment.

Shell Flat and Lune Deep SAC

6.3.26 Shell Flat and Lune Deep SAC (JNCC, 2017) lies offshore of Blackpool and Fleetwood and protects the subtidal sandbanks of Shell Flat. This area supports rocky reefs found on the slopes of the Lune Deep, a glacially formed trench that leads into Morecambe Bay.

6.3.27 There are 6 potential pressures/threats (including fisheries (commercial), transportation and service corridors, fisheries (recreational), extraction (non-living), siltation and water pollution) which have been identified for this European site which is included within the SIP for Liverpool Bay (Natural England, 2015) and the Supplementary Advice identifies the types of activities (all marine based) which could impact on the ability of the Conservation Objectives of the site to be met. However, given the distance of the Shell Flat and Lune Deep SAC from the Scheme (approximately 9km), there are no elements of the Scheme which could give rise to any likely significant effects on the qualifying features of the SAC.

6.3.28 Potential impacts on the Shell Flat and Lune Deep SAC have therefore been **screened out** of further assessment.

6.4 Conclusion of Screening of European sites

6.4.1 The screening exercise has identified 2 European sites which cannot be ruled out of the assessment at this stage (refer to Table 8). These are described in further detail within Section 6.5 below.

6.4.2 The remaining 5 European sites have been screened out of further assessment and are not considered further in this HRA Report alone (further in combination assessment is required to confirm no in combination impacts with other plans or projects, refer to Section 6.10).

Table 8: European Sites Screened in and out of Further Assessment

Name of Site	Screened in/out of assessment?
European Sites within 2km	
Morecambe Bay and Duddon Estuary SPA	Screened in (only in relation to qualifying bird species and water quality, all other impacts have been screened out)
Morecambe Bay Ramsar site	
European Sites within 10km	
Morecambe Bay SAC	Screened out
Ribble and Alt Estuaries SPA	
Ribble and Alt Estuaries Ramsar site	
Liverpool Bay SPA	
Shell Flat and Lune Deep SAC	

6.5 Description of the European Sites Screened In

Morecambe Bay and Duddon Estuary SPA

6.5.1 Since the preparation of the October 2016 Screening Report (Arcadis, 2016), the Morecambe Bay SPA has been formally merged, in April 2017, with the Duddon Estuary SPA to form the single Morecambe Bay and Duddon Estuary SPA. The site citation (Natural England, 2017) provides the species and numbers of birds which form qualifying features of the SPA, these are provided in Table 9.

Table 9: Qualifying Features of the Morecambe Bay and Duddon Estuary SPA

Species	Count (2010/11-2014/15)
During the breeding season	
Little term *Sterna albifrons*	84 individuals
Sandwich tern *Sterna sanvicensis*	1,608 individuals
Common tern *Sterna hirundo*	570 individuals
Lesser black-backed gull *Larus fuscus graellsii*	9,720 individuals
Herring gull *Larus Argentatus*	20,000 individuals
Internationally important seabird population of over 20,000 individuals	40,672 individuals
During the non-breeding season	
Whooper swan *Cygnus*	113 individuals

Species	Count (2010/11-2014/15)
Pink-footed goose *Anser brachyrhynchus*	15,648 individuals
Shelduck *Tadorna*	5,878 individuals
Pintail *Anas acuta*	2,498 individuals
Little egret *Egretta garzetta*	134 individuals
Oystercatcher *Haematopus ostralegus*	55,888 individuals
Golden plover *Pluvialis apricaria*	1,900 individuals
Grey plover *Pluvialis squaterola*	2,000 individuals
Ringed plover *Charadrius hiaticula*	1,049 individuals
Curlew *Numenius arquata*	12,209 individuals
Black-tailed godwit *Limosa*	2,413 individuals
Bar-tailed godwit *Limosa lapponica*	3,046 individuals
Turnstone *Arenaria interpres*	1,359 individuals
Knot *Calidris canutus*	32,739 individuals
Ruff *Calidris pugnax*	8 individuals
Sanderling *Calidris alba*	3,600 individuals
Dunlin *Calidris alpina alpina*	26,982 individuals
Redshank *Tringa totanus*	11,133 individuals
Mediterranean gull *Larus melancephalus*	18 individuals
Lesser black-backed gull *Larus fuscus*	9,450 individuals
Internationally important waterbird assemblage of over 20,000 individuals	266,751 individuals

6.5.2 There are no specific measures outlined in the Morecambe Bay SIP (covering Morecambe Bay and the Duddon Estuary) that address activities occurring outside the boundary of the designated area. However, as per Section 6.3.3 Supplementary Advice for the Morecambe Bay and Duddon Estuary SPA (Natural England, 2019) provides details of attributes which need to be protected in order for the Conservation Objectives of the SPA to be achieved and these were considered throughout the assessment.

Morecambe Bay Ramsar Site

6.5.3 The site citation provides the species and numbers of birds which form qualifying features of the Ramsar site, these are provided in Table 10. It should be noted that the Ramsar site covers Morecambe Bay only and therefore represents a smaller area than the now combined Morecambe Bay and Duddon Estuary SPA.

Table 10: Qualifying Features of the Morecambe Bay Ramsar site

Species	Count
Ramsar criterion 4: The site is a staging area for migratory waterfowl including internationally important numbers of passage ringed plover *Charadrius hiaticula*	
Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: 223,709 waterfowl (5 year peak mean 1998/99-2002/2003)	
Ramsar criterion 6 – species/populations Occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species regularly supported during the breeding season:**	
Sandwich tern	290 pairs, representing an average of 2.8% of the GB population (5 year mean for 1992 to 1996)
Lesser black-backed gull	19,666 apparently occupied nests, representing an average of 13.3% of the breeding population (Seabird 2000 Census)
Herring gull	10,431 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census)
Species with a peak Spring/Autumn	
Great Cormorant	967 individuals, representing an average of 4.2% of the GB population (5 year peak mean 1998/9- 2002/3)
Shelduck	7032 individuals, representing an average of 2.3% of the population (5 year peak mean 1998/9-2002/3)
Pintail	3743 individuals, representing an average of 6.2% of the population (5 year peak mean 1998/9-2002/3)
Eider	5657 individuals, representing an average of 7.7% of the GB population (5 year peak mean 1998/9-2002/3)

Species	Count
Oystercatcher	55,888 individuals 66577 individuals, representing an average of 6.5% of the population (5 year peak mean 1998/9-2002/3)
Ringed plover	1041 individuals, representing an average of 1.4% of the population (5 year peak mean 1998/9-2002/3)
Grey plover	1655 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9-2002/3)
Sanderling	703 individuals, representing an average of 3.4% of the GB population (5 year peak mean 1998/9- 2002/3 - spring peak)
Curlew	20018 individuals, representing an average of 4.7% of the population (5 year peak mean 1998/9-2002/3)
Redshank	8816 individuals, representing an average of 3.5% of the population (5 year peak mean 1998/9-2002/3)
Turnstone	1,359 individuals 1371 individuals, representing an average of 1.4% of the population (5 year peak mean1998/9-2002/3)
Lesser black-backed gull	40393 individuals, representing an average of 7.6% of the population (5 year peak mean 1998/9-2002/3)
Species with a peak count in winter	
Great crested grebe	217 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9- 2002/3)
Pink-footed goose	3665 individuals, representing an average of 1.5% of the population (5 year peak mean 1998/9-2002/3)
Wigeon	6133 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Goldeneye	285 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9- 2002/3)
Red-breasted merganser	327 individuals, representing an average of 3.3% of the GB population (5 year peak mean 1998/9- 2002/3)
Golden plover	4073 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Lapwing	16,492 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9- 2002/3)

Species	Count
Knott	66335 individuals, representing an average of 14.7% of the population (5 year peak mean 1998/9-2002/3)
Dunlin	26416 individuals, representing an average of 1.9% of the population (5 year peak mean 1998/9-2002/3)
Bar-tailed godwit	4579 individuals, representing an average of 3.8% of the population (5 year peak mean 1998/9-2002/3)

6.6 Screening of Qualifying Species Associated with Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site

6.6.1 Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site support a number of individual qualifying species, as well as important water-bird assemblages, throughout the passage and wintering period (refer to Table 9 and Table 10).

6.6.2 No construction works would take place within the SPA/Ramsar site itself, or within the intertidal habitat adjacent to the River Wyre. Therefore, the Scheme would not give rise to any direct impacts upon the key habitats of the species for which the SPA/Ramsar site is designated. This section of the screening exercise therefore focusses on potential indirect effects on the qualifying bird species of the SPA/Ramsar site. All other potential effects have been screened out alone (refer to Section 6.3, above).

Winter/passage (individual qualifying species)

6.6.3 Sixteen Morecambe Bay and Duddon Estuary SPA qualifying species (designated for peak counts during the winter, on passage or both) were recorded during the passage and winter bird transect surveys over the 2 survey seasons. Cormorant, oystercatcher, shelduck, redshank, dunlin, black-tailed godwit, knot, red-breasted merganser and ringed plover were all recorded. However, none of the records were above the 1% threshold SPA/Ramsar site population for the species during any of the bird surveys and can therefore be screened out of further assessment as individual qualifying species (refer Table 3 and Appendix 3).

6.6.4 Lesser black-backed gull, wigeon, golden plover, little egret, curlew, lapwing and pink-footed geese were all recorded above the 1% or greater threshold within the Bird Survey Area, as detailed below.

6.6.5 The bird survey results show that pink-footed geese, curlew and lapwing are present within the Bird Survey Area throughout the passage and wintering periods (refer to Appendix 3 and Figure 3, Sheet 1 of Appendix 1). The largest flocks have predominantly been recorded within Bird Survey Area 6 (the River Wyre), with 1% or greater of the SPA/Ramsar site populations of these species recorded in this area on more than 1 occasion. Flocks comprising birds 1% or greater of the SPA/Ramsar site population threshold were also recorded within 300m of the Scheme (refer to Figure 3, Sheet 2, Figure 3 and 4, Appendix 1). Further consideration at the AA stage of these species is therefore required.

6.6.6 Little egret were regularly recorded during within the Bird Survey Area throughout the passage and wintering periods (refer to Figure 6, Appendix 1). The population

associated with the SPA/ Ramsar site is 134 birds, therefore all records would represent at least 1% of the SPA population (refer to Figure 6, Sheet 2, Appendix 1). Further consideration at the AA stage of this species is therefore required.

6.6.7 Although lesser black-backed gull were regularly observed, only 1 flock was recorded in numbers above the 1% or greater threshold population (the peak count of 130 birds in Bird Survey Area 6 equates to 1.3% of the SPA population). Given that this record was related to the River Wyre, and all remaining records within the Bird Survey Area were below the 1% threshold; it is considered appropriate to **screen out** further impacts on lesser black-backed gull.

6.6.8 Wigeon were recorded sporadically throughout the survey period. All records of 1% or greater of the SPA population were recorded within Bird Survey Area 6 (the River Wyre). Given that the majority of the wigeon records are related to the River Wyre, and all records away from the River Wyre were below the 1% SPA threshold population; it is considered appropriate to screen out further impacts on wigeon.

6.6.9 Golden plover were also recorded in numbers above 1% of the SPA threshold population. Similarly, the majority related to Bird Survey Area 6 (the River Wyre) or immediately adjacent habitats and all records away from the River Wyre were below the 1% threshold. It is therefore considered appropriate to also screen out further impacts on golden plover.

Overwintering and Seabird Assemblage

6.6.10 In addition to the individual qualifying features discussed above, the overwintering waterbird assemblage is also a qualifying feature of both the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site, and the seabird assemblage population is a qualifying feature of Morecambe Bay and Duddon Estuary SPA.

6.6.11 Birds which could make up the overwintering waterbird assemblage associated with the SPA/Ramsar site were recorded throughout the winter surveys in the vicinity of the Scheme, refer to

6.6.12 Table 5, and Appendix 3. Given the proximity to the Scheme, and number of birds recorded the overwintering waterbird assemblage has been **screened in** for further assessment at the AA stage.

6.6.13 Although 2 species associated with the seabird assemblage were recorded during the bird surveys (herring gull and lesser black-backed gull), the majority of birds which would constitute the seabird assemblage are associated with marine and coastal habitats to the north of the Scheme. Therefore, the Scheme would not give rise to likely significant effects on this qualifying feature and has been **screened out** of further assessment.

Breeding Birds

6.6.14 Two Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site qualifying species were observed during the 2017 breeding bird transect surveys: herring gull and lesser black-backed gull.

6.6.15 The main breeding colonies for these species within the SPA/Ramsar site are located to the north of the Scheme at the South Walney and Piel Channel Flats Site of Special Scientific Interest (SSSI), more than 30km away. Research carried

out by the BTO at the SSSI (BTO, May 2017) indicates that these species can travel as far as the Fylde Peninsula to forage, however, areas near to the colony were used most frequently. Both species were recorded throughout the breeding season, with birds utilising the River Wyre and fields within and adjacent to the Scheme for foraging and loafing. However, neither of these species were recorded in numbers above the 1% or greater threshold breeding population (the peak count of 13 herring gull equates to less than 0.2% of the breeding population and peak count of 22 lesser black-backed gull equates to less than 0.1% of the breeding population). Although it is possible that a proportion of the birds recorded during the breeding bird surveys were part of the internationally important breeding populations, given the small numbers of birds recorded, and distance from the breeding colonies, it is considered unlikely that the Scheme would have a likely significant effect on the breeding populations of herring gull and lesser black-backed gull associated with the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. Herring gull and lesser black-backed gull during the breeding season have therefore been **screened out** of further assessment.

6.7 Conclusion of Screening of Qualifying Features

6.7.1 The screening exercise has identified 4 species associated with the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site which cannot be ruled out of the assessment at this stage (refer to Table 11). The remaining qualifying features have been screened out of the assessment and is not considered further in this Report.

Table 11: SPA/Ramsar Site Qualifying Species Screened in/out of the Assessment

Species	Screened in/out
1% or greater of the SPA/Ramsar site population recorded within Bird Survey Area	
Pink-footed geese Curlew Lapwing Little egret Overwintering waterbird assemblage	Screened in
Lesser black-back gull Herring gull Wigeon Golden plover Seabird assemblage	Screened out

Species	Screened in/out
SPA/Ramsar site qualifying species recorded within the Bird Survey Area, but no records 1% or greater of the SPA/Ramsar site population	
Shelduck Oystercatcher Redshank Dunlin Black-tailed godwit Knot Cormorant Red-breasted merganser Ringed plover	Screened out

6.8 Screening of Potential Impacts

6.8.1 The following potential impacts on the qualifying species of the SPA/Ramsar site were identified during the screening of the European sites. All other potential impacts have been screened out of further assessment alone (refer to Section 6.3).

- Disturbance/displacement
- Loss of foraging/ roosting habitat
- Habitat fragmentation
- Water quality

6.8.2 In order to confirm which potential impacts should be considered in the AA, each of the potential impacts has been considered in the context of the bird survey results and other relevant assessments that have been completed.

6.8.3 Potential impacts considered in the assessment relate to the construction and operational phases of the Scheme only. The new road Scheme is likely to become an integral part of the infrastructure network in the area (refer to Section 2.19, within Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2). As such, full decommissioning of the Scheme would not be either feasible or desirable and, consequently, it is not considered appropriate for decommissioning to form part of the EIA or HRA. This approach was agreed with the Inspectorate as part of the Scoping Opinion for the Scheme (document reference TR010035/APP/6.20).

Disturbance/displacement

6.8.4 Disturbance/displacement of designated breeding, resting or foraging sites for qualifying features (i.e. birds) that may result in an effect on the overall viability of the population may represent a likely significant effect on that qualifying feature, whereas disturbance/displacement of foraging or breeding sites within the wider habitat, where alternative habitat is available, may not. If disturbance/displacement impacts are only likely to result in displacement of a small percentage of a

qualifying species (less than 1% of the SPA/ Ramsar site population, as agreed with Natural England on 15 December 2015) then the disturbance/displacement could be considered as not having a significant effect on the qualifying feature. Disturbance/displacement to a larger number of birds (1% or greater of the SPA/Ramsar site population) used by foraging and roosting birds could be considered a likely significant impact. One percent or greater of the SPA/Ramsar site populations of pink-footed geese, curlew, lapwing and little egret have been recorded within 300m of the Scheme. In addition to individually qualifying species, species associated with the waterbird assemblage have also been recorded within 300m the Scheme. Potential impacts associated with disturbance/ displacement during the construction and operational phases of the Scheme **require further consideration at the AA stage**.

Loss of foraging/roosting Habitat

6.8.5 The results of the bird surveys show that SPA/Ramsar site species (including species associated with the waterbird assemblage) are utilising some of the land which would be lost under the footprint of the Scheme. **Further consideration of this potential impact during the construction and operational phases is therefore required at the AA stage.**

Habitat Fragmentation

6.8.6 Fragmentation effects to land parcels within the Bird Survey Area could arise as a result of the Scheme. However, the results of the bird surveys indicate that the existing road network in the area has not resulted in a severance of flight lines between the SPA/Ramsar site and the surrounding agricultural land. For example, the great majority of observations of geese were of birds in flight, crossing the Bird Survey Area *en route* to locations elsewhere. In addition, other species such as curlew and lapwing were observed in suitable habitat throughout the Bird Survey Area suggesting that the existing roads and infrastructure were not fragmenting habitats away from the SPA/Ramsar site. Given that the new road would follow in parallel with the existing A585/Mains Lane and would comprise online widening at the eastern end of the Scheme, no fragmentation effects are envisaged as a result of the new road Scheme.

6.8.7 Potential impacts associated with fragmentation effects can be **screened out** of further assessment.

Water Quality

6.8.8 The bird survey results show that relatively large numbers of SPA/Ramsar site species are utilising the River Wyre as a foraging and roosting resource. The Main Dyke feeds directly into the River Wyre which is within the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. Construction works would be required within and adjacent to the Main Dyke (in particular, at the location of the new Skippool Bridge crossing of the Main Dyke at the western end of the Scheme), and therefore there is the potential for water quality impacts on the waterbird assemblage associated with the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site which are using the River Wyre (downstream of the new bridge crossing) as a foraging resource. Run off from the construction site could also enter the Main Dyke and its tributaries. **Further consideration of these potential impacts during the construction phase are therefore required at the AA stage.**

6.8.9 In relation to the operational phase, the completed Scheme would require the management of surface water run-off from the road, and accidental spillage. The water quality assessment included a Highways Agency Water Risk Assessment Tool (HAWRAT) (refer to Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12). Taking various parameters into consideration (including traffic flows and distance from designated sites), the HAWRAT assessment concluded that there would be a requirement for mitigation in relation to possible water quality effects associated with catchments 4 to 7, but not for catchments 1 to 3 (which are the catchments closest to the River Wyre). The requirement for mitigation for catchments 4 to 7 was not linked to the proximity of the designated site, but was in relation to increased traffic flows. The mitigation would include measures such as wetland areas with penstocks to manage water flow, and balancing ponds. Given that the water quality assessment did not identify any need for specific additional mitigation measures to protect water quality of the adjacent designated sites, it is considered that there would be **no likely significant effect** on the nearby SPA/Ramsar site during the operational phase of the Scheme, and this potential impact can be screened out of further assessment.

6.9 Conclusion of Screening of Potential Impacts to be Considered within the Appropriate Assessment

6.9.1 The screening exercise has identified 3 potential impacts which cannot be ruled out of the assessment at this stage (refer to Table 12). The remaining potential impacts have been screened out of the assessment and not be considered further in this HRA Report.

Table 12: Potential Impacts Screened in/out of the Assessment

Potential impact associated with the Morecambe Bay and Duddon estuary SPA/ Morecambe Bay Ramsar site	Screened in/out of assessment?	
	Construction	Operation
Disturbance/displacement	Screened in	Screened in
Loss of foraging/ roosting habitat		
Water quality effects	Screened in	Screened out
Fragmentation	Screened out	Screened out

6.10 In Combination Effects

6.10.1 Seven plans or projects were identified with the potential for in combination effects with the Scheme (refer to Table 16-4 within Chapter 16: Cumulative Effects (document reference TR010035/APP/6.16). These are assessed in Table 13.

Table 13: In Combination Assessment of other Plans and Projects

Plan or Project	Distance from Scheme	Potential Impacts	In combination effect?
16/01043/OULMAJ Outline application for the erection of up to 130 dwellings with means of access off Holts Lane (layout, landscaping, scale and appearance reserved), following demolition of existing buildings (re-submission of 16/00233/OULMAJ). Land Off Holts Lane Poulton-le-Fylde Lancashire.	1.2km south west	Natural England consulted on the planning application and confirmed that the development is unlikely to affect European sites. Assessment of the allocation site as part of the Wyre Local Plan HRA (Arcadis, 2017) did not identify any likely significant effect on European sites alone. Potential in combination effects associated with recreation pressure was highlighted as a potential impacts and mitigation put in place within the Plan. Recreational pressure has not been identified as a potential impact of the current Scheme. Therefore, there would be no in combination effects with this site and the Scheme.	No
17/00050/REMMAJ Reserved matters application for the erection of 160 dwellings with associated works Land on The East Side of Lambs Road Thornton Cleveleys Lancashire	878m East	Project-level HRA Screening undertaken for the site concluded no likely significant effect on European sites. NE consulted on the planning application and agreed with this conclusion. Assessment of the allocation site as part of the Wyre Local Plan HRA (Arcadis, 2017) did not identify any likely significant effect on European sites alone. Potential in combination effects associated with recreation pressure was highlighted as a potential impacts and mitigation put in place within the Plan. Recreational pressure has not been identified as a potential impact of the current Scheme. Therefore, there would be no in combination effects with this site and the Scheme.	No
13/00200/OULMAJ	1.7 km west	No comment from NE associated with planning application (13/00200) for 220 dwellings.	No

Plan or Project	Distance from Scheme	Potential Impacts	In combination effect?
Outline application for mixed use development consisting of Class B1 (office) floorspace, Class C3 (residential) and a local centre consisting of a supermarket, Class A1/A2/A3/A4 and A5 uses together with vehicular and pedestrian access, open space and landscaping Land at Norcross Lane Thornton Cleveleys Lancashire FY5 3TZ		Assessment of the allocation site as part of the Wyre Local Plan HRA (Arcadis, 2017) did not identify any likely significant effect on European sites alone. Potential in combination effects associated with recreation pressure was highlighted as a potential impacts and mitigation put in place within the Plan. Recreational pressure has not been identified as a potential impact of the current Scheme. Therefore, there would be no in combination effects with this site and the Scheme.	
17/00951/OUTMAJ Outline application for the erection of up to 66 dwellings with access applied for off Lambs Road (all other matters reserved). Land on the East Side of Lambs Road Thornton Cleveleys Lancashire	995m East	Natural England consulted on the planning application and confirmed no likely significant effect on European sites with appropriate mitigation measures in place for recreational pressure (including home owner packs and inclusion of recreational multi-use green space). Assessment of the allocation site as part of the Wyre Local Plan HRA (Arcadis, 2017) did not identify any likely significant effect on European sites alone. Potential in combination effects associated with recreation pressure was highlighted as a potential impacts and mitigation put in place within the Plan. Recreational pressure has not been identified as a potential impact of the current Scheme. Therefore, there would be no in combination effects with this site and the Scheme.	No
16/00742/OUTMAJ Outline application for the erection of up to 108 no. dwellings (Use Class	1.3km south west	Natural England consulted on the planning application and confirmed that the development is unlikely to affect European sites.	No

Plan or Project	Distance from Scheme	Potential Impacts	In combination effect?
C3) with all matters reserved except for access, which will be off Brockholes Crescent following demolition of numbers 61 and 63 Brockholes Crescent. Land Off Brockholes Crescent Poulton-le-Fylde Lancashire		Assessment of the allocation site as part of the Wyre Local Plan HRA (Arcadis, 2017) did not identify any likely significant effect on European sites alone. Potential in combination effects associated with recreation pressure was highlighted as a potential impacts and mitigation put in place within the Plan. Recreational pressure has not been identified as a potential impact of the current Scheme. Therefore, there would be no in combination effects with this site and the Scheme.	
Policy SA 1/8 (within Wyre Local Plan) Blackpool Road, Poulton-le-Fylde	1.1 km west	No comment from NE associated with planning application at the southeast of the allocation site (17/00632) for 35 dwellings. Remainder of the area provides allocation for 265 dwellings with no current/ pending planning applications. Assessment of the whole allocation site as part of the Wyre Local Plan HRA (Arcadis, 2017) did not identify any likely significant effect on European sites alone. Potential in combination effects associated with recreation pressure was highlighted as a potential impacts and mitigation put in place within the Plan. Recreational pressure has not been identified as a potential impact of the current Scheme. Therefore, there would be no in combination effects with this site and the Scheme.	No
The Fleetwood – Thornton Area Action Plan establishes a clear vision and planning framework for development of Fleetwood and Thornton over the next 15-20 years and is a very important	1.9km north west	The HRA of the AAP (Atkins, 2009) identified a number of potential impacts associated with future development within the AAP. Those which would be relevant to this assessment include: • disturbance to bird populations during construction works; and	Yes

Plan or Project	Distance from Scheme	Potential Impacts	In combination effect?
consideration in any decision on planning applications in the area. It includes areas identified for residential, industry and community facilities		• contamination from emissions to water as a result of increased industrial use or increased housing density. Given that there is the potential for development within the AAP to be taking place at the same time as the current Scheme, further AA of these potential in combination effects will be required.	

6.11 Conclusion of In Combination Assessment

6.11.1 The in-combination assessment of the 7 plans or projects determined that there would be no likely significant in combination effects with 6 of the plans or projects and therefore these can be screened out of further assessment. The only plan with the potential for likely significant effects was in relation to the Fleetwood – Thornton AAP. Further AA of this in combination effect (in relation to disturbance and water quality) is required. All other potential in combination effects have been screened out of further assessment.

6.11.2 As per the Wealden District Council v. Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351 and Natural England Guidance (*Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations*, June 2018) consideration of air quality in relation to each of the European sites has been assessed (refer to Section 6.3) and determined that there would be no likely significant effects on Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site or Morecambe Bay SAC. In relation to in combination effects, there are no plans or projects in Table 13 where in combination effects in terms of air pollution are anticipated.

6.12 Potential Impacts and Features to be Considered in the Appropriate Assessment

6.12.1 Those potential impacts and features associated with the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site subsequently taken forward into the AA stage as a result of the screening exercise are included in Table 14.

6.12.2 All other SPA / Ramsar site qualifying species and potential impacts have been screened out of further assessment.

Table 14: Potential Impacts and Features Considered in the Appropriate Assessment

Potential impact	Feature	Construction	Operation
Disturbance/ displacement	Pink-footed goose Curlew Lapwing Little egret Overwintering waterbird assemblage	Disturbance to birds using within and adjacent to the construction works (including construction traffic, noise and visual effects)	Disturbance to birds using land adjacent to the operational road (including noise and visual effects)

Potential impact	Feature	Construction	Operation
Loss of foraging/ roosting habitat	Pink-footed goose Curlew Lapwing Little egret Overwintering waterbird assemblage	Direct loss of foraging/ roosting habitat under the footprint of the construction works (temporary)	Direct loss of foraging/ roosting habitat under the footprint of the construction works (permanent)
Change in water quality	Overwintering waterbird assemblage	Change in water quality downstream of the Main Dyke and its tributaries as a result of construction works	Screened out

6.12.3 The AA of potential impacts on these sites and features is found in Section 7 of this HRA Report.

6.12.4 The AA also includes an in-combination assessment of, the Scheme in relation to potential disturbance effects and water quality during construction, as set out in Table 13.

6.12.5 The Inspectorate's Screening Matrix summarises the information required for the AA, can be found in Appendix 4.

7 APPROPRIATE ASSESSMENT OF POTENTIAL EFFECTS ON EUROPEAN SITES

7.1 Introduction

7.1.1 The Screening exercise concluded that the potential for likely significant effects could not be ruled out for the following qualifying features: pink-footed geese, lapwing, curlew, and little egret. This was on the basis that peak numbers for each species recorded during bird surveys (undertaken over 2 survey seasons 2016 – 2018) exceeded the 1% or greater significance threshold of the SPA/Ramsar site population within 300m of the Scheme and these have been taken through for further AA. The overwintering waterbird assemblage has also been screened into the AA due to the proximity and number of birds recorded in the vicinity of the Scheme.

7.1.2 The potential effects identified during the construction phase of the Scheme comprised: displacement/ disturbance to bird species through noise and visual disturbance from construction activities; potential displacement/disturbance to bird species in the fields adjacent to the construction area through noise and visual disturbance; loss of foraging/ roosting habitat under the footprint of the construction site; and changes in water quality as a result of the construction works.

7.1.3 The potential effects identified during the operation phase of the Scheme comprised: potential displacement/disturbance to SPA/Ramsar site bird species through noise and visual disturbance from the new road; and loss of foraging/ roosting habitat under the footprint of the completed Scheme.

7.1.4 The following section assesses the potential effects of the Scheme on the bird species screened in to the AA against the Conservation Objectives of the European sites. The Conservation Objectives are set out in Section 7.2.

7.2 Conservation Objectives

7.2.1 In April 2017 the Morecambe Bay SPA was formally merged with the Duddon Estuary SPA to form the single Morecambe Bay and Duddon Estuary SPA. The Conservation Objectives relating to the merged SPA were published in September 2017 (Natural England, 2017).

7.2.2 The Conservation Objective for the site is to:

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

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

7.2.3 There are no stand-alone Conservation Objectives for the Ramsar site; the

Conservation Objectives set out for the SPA designation would be relevant to the Ramsar site designated features.

7.3 Embedded Mitigation

7.3.1 The Scheme includes a number of embedded environmental design measures which have been incorporated into the Scheme design to ensure protection of the natural environment. These have also been taken into consideration in the AA, are presented on the Environmental Masterplan (document reference TR010035/APP/6.19 – Rev 1) and include:

- Minimising the removal of habitats
- Extensive landscaping including new tree, woodland, shrub and hedgerow planting along with bunding to reduce noise and visibility of the Scheme
- Provision of additional ponds
- Installing underpasses and specially adapted culverts to increase the permeability of the Scheme for protected species and reduce the barrier effect
- Provision of low noise/thin surfacing system surface to be laid on new or altered roads to mitigate against noise
- Various sizes of acoustic barriers along the east and west bound carriageways
- A drainage design has been developed for the operational Scheme to remove water and prevent flooding of the carriageway and sustainable drainage Systems (SuDS) are incorporated in to the Scheme's design

7.4 Construction Effects

7.4.1 Construction is anticipated to last for approximately 2 years and commence in Spring 2020 (i.e. the construction would take place across 2 winters). The construction phasing is shown within Appendix 2.1: Construction Information (document reference TR010035/APP/6.2.1).

Potential Displacement/disturbance to SPA/Ramsar Site Bird Species Utilising Land Within and Adjacent to the Construction Works

Background Information

7.4.2 Scientific research has demonstrated that increased disturbance can affect wintering waders and wildfowl in the following ways (Liley, D. *et al* (2015)):

- Redistribution of birds in response to the presence of people. Redistribution can be short-term, in response to individual disturbance events, or more chronic, with birds simply avoiding otherwise suitable habitat
- Reduced intake-rate of food as a response to disturbance, due to birds feeding in areas with poorer availability of food resources
- Increased energy expenditure as a result of birds reacting to disturbance by flying to different areas to feed and being flushed while feeding and roosting
- Physiological impacts, such as increased stress. Increased stress levels heart rate etc., may also have consequences for energy expenditure

7.4.3 Liley, D. *et al* (2015), also suggested that on a single site, localised disturbance

during the non-breeding season in a small part of a site for a small amount of time may not result in a major impact, as birds are highly mobile, and within a large site there would probably be other areas nearby where birds can feed or roost. For non-breeding birds, switching to alternative locations within a site might take seconds, and the impact from a single brief event would be negligible. However, more chronic disturbance, regularly affecting larger areas of sites, may have more serious effects.

7.4.4 Table 15 shows information on disturbance/displacement for the 4 individual qualifying species scoped in to the AA.

Table 15: Disturbance / displacement Distances

Species	Waterbird Escape Distances (EDs) detailed in Lauresen, K. *et al* (2005)	Species specific information detailed in Cutts, N. *et al* (2013)	Other sources of information
Pink-footed geese	Species not specifically mentioned.	Species not specifically mentioned.	Owen (1973) found that noise is less important than visual disturbance, to pink-footed geese, but sudden sounds such as the starting of an engine, and especially shots or bangs usually have an effect. The birds habituate to regular noises. Madsen (1995) studied the impacts of disturbance by farmers (bird scaring) on spring-fattening pink-footed geese and found that disturbance can affect body condition and subsequent reproductive output. In the undisturbed sites 43% of birds bred successfully, compared to only 17% in the disturbed sites.
Curlew	Mean ED= 298m Min-Max ED= 58-650m	Wary of moderate and high level visual disturbance. Mitigation should be considered for birds closer than 300m.	Curlew are considered (together with Redshank) as amongst the most “nervous” of waders on wintering grounds

Species	Waterbird Escape Distances (EDs) detailed in Lauresen, K. *et al* (2005)	Species specific information detailed in Cutts, N. *et al* (2013)	Other sources of information
		Moderately sensitive to noise stimuli but due to their wary nature the minimum approach distance can be expected to be no less than 100m. At this distance using the noise response table, noise required to create high level disturbance would be 107 – 112dB at source.	(Davidson & Rothwell 1993), with escape flight distances amongst the greatest of studied inter-tidally feeding wader species (Smit & Visser 1993), although this is highly site-dependent (e.g. Fitzpatrick & Bouchez 1998) and related to the hunting intensity in the country concerned. This information was taken from the Management Plan for Curlew (European Communities, 2007).
Lapwing	Mean ED= 142m Min-Max ED= 45-450m	Reasonably tolerant of moderate level visual disturbance stimuli. Response to visual disturbance at approximately 300 – 400m. Mitigation should be considered for birds that are closer than 300m. Likely to be moderately sensitive to noise stimuli but there is little evidence to support this so a standard 'precautionary' approach to sensitivity to noise should be applied, with noise of up to 72dB acceptable at the bird but with caution above 55dB (60dB in highly disturbed areas). As lapwing would roost to within 200m of plant, this means that a source noise threshold of 115 – 120dB can be applied, but with caution	No information found in relation to this species.

Species	Waterbird Escape Distances (EDs) detailed in Lauresen, K. *et al* (2005)	Species specific information detailed in Cutts, N. *et al* (2013)	Other sources of information
		above 87 – 92dB.	
Little egret	Species not specifically mentioned.	Species not specifically mentioned.	Little egret tend to forage as individuals, or small groups. When foraging as individuals they tend to be more tolerant of human activity (Kirsty *et al*, 2002).

7.4.5 In relation to the current study, birds utilising land within the Bird Survey Area are already subject to high levels of background noise and visual disturbance associated with the existing infrastructure around Skippool and Poulton-le-Fylde (including roads and housing). The wintering bird surveys indicate that birds would use fields adjacent to the existing road and are generally habituated to a higher level of disturbance than birds which would utilise more rural locations. Therefore, taking into consideration the bird survey results, the background information in Table 15, and discussion with Natural England (17 April 2018 meeting) a disturbance/displacement distance of 300m would be used when considering potential noise and visual disturbance/displacement associated with the Scheme. Birds utilising habitats outside of the 300m buffer are considered to be of sufficient distance, and in many cases located behind existing development and infrastructure, such that there would be no visual or noise disturbance/displacement from the construction works. Birds outside of the 300m buffer have therefore been excluded from the remainder of the assessment, and this approach was agreed in consultation with Natural England (meeting 17 April 2018).

Noise and Visual Effects

7.4.6 The potential displacement/disturbance effects on SPA/Ramsar site bird species identified during the assessment comprise:

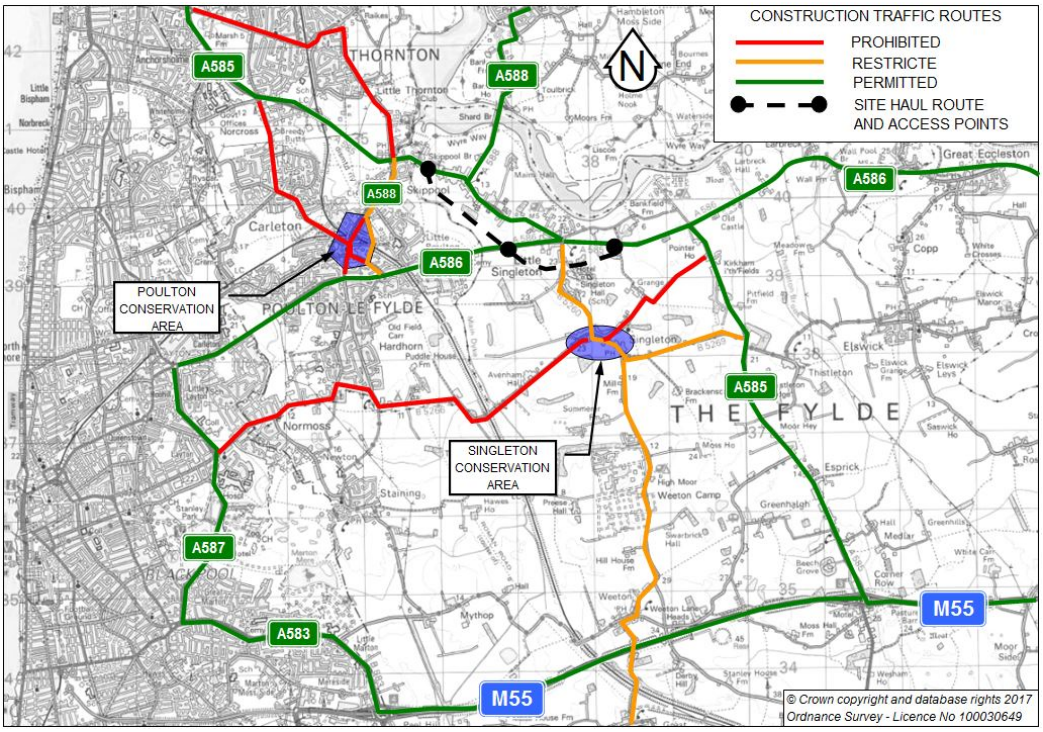
- Disturbance from construction vehicles along the access routes to the construction works
- Disturbance/displacement from amendments to existing public rights of way
- Disturbance/displacement associated with night time working
- Displacement caused by construction phase lighting, and noise
- Disturbance/displacement of birds due to drainage works within Land Parcel 13 (Survey Area 3)
- Visual disturbance from the construction works itself

7.4.7 Each of these is discussed in detail below.

Vehicle Movements / Access Routes to Construction Works

7.4.8 Inset 7-1 shows the proposed access routes to and from the construction works.

Insert 7-1: Construction Access Routes



7.4.9 The construction routes include the M55, the existing A585, A586, A588, A587 and A583, all of which are already subject to high volumes of traffic. Access along minor roads (such as those around Singleton Conservation Area) would also be prohibited or restricted to light vehicles only. Any birds using fields adjacent to the main A-road access routes would already be subject to high levels of disturbance from the existing traffic flows. The restrictions on the minor roads would minimize any impacts to birds adjacent to these smaller, less used routes.

7.4.10 Due to the temporary nature of the works, and habituation of birds to exiting traffic volumes, any potential disturbance/ displacement effects associated with the access routes to and from the construction works would be negligible and not significant.

Public Rights of Way (PRoW)

7.4.11 Section 4.7 describes the public footpaths would be altered as a result of the Scheme. Alternative routes would be provided to enable residents to continue to use the same footpaths. All footpath works would be restricted to within the draft Order Limits, and any alterations to the routes would not affect any land utilised by SPA/Ramsar site species within or outside of the draft Order Limits. There would be no impacts on SPA/Ramsar site bird species associated with alterations of footpaths as a result of the Scheme.

Night time Working

7.4.12 The typical core working hours for the Scheme would be between 08:00 and 18:00 on weekdays (excluding bank holidays) and from 08:00 to 16:00 on Saturdays (refer to Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2). In addition, there would be a start-up and closedown period of 1 hour either side of these times to maximise efficiency of the core hours. This would include activities such as deliveries, movements to work areas, maintenance and general preparation works, but would not include running plant and machinery. It is proposed that the majority of the works would be constructed within the typical core working hours with no requirement or intention for prolonged late night or 24-hour working. The only exceptions to this would be for some small-scale surfacing tie-in activities (such as installing kerbing, pavement/drainage works and associated traffic management), some cross-carriageway utilities diversions and works around Skippool Junction and Skippool Bridge which (for health and safety reasons) would be carried out overnight.

7.4.13 Based on the current indicative construction programme (which would be reviewed in liaison with the utility companies and finalised by the Contractor once appointed), there are an estimated 95 nights throughout the 2-year construction period where night working could take place. However, of these, only 30 nights are expected to take place during the winter period (12 during winter 2020/21 and 18 during winter 2021/22). Of these 30 nights, 22 would take place to the west of the Scheme around Skippool Bridge and Skippool junction, within areas close to existing urban development and less suitable for SPA / Ramsar site species. Skippool Bridge and Skippool junction lie to the south west of the bird mitigation area. Any works at these locations would be screened from the fields by existing housing and tree/scrub vegetation in the vicinity of Old Mains Lane; and as such no noise and/ or visual disturbance to birds utilising the mitigation area during the small number night time working periods, is considered likely.

7.4.14 The remaining 8 nights of work would take place around Poulton Junction and Grange footbridge in areas where birds are already habituated to existing road traffic noise / maintenance / lighting of the existing A585 (and away from the mitigation area).

7.4.15 Taking account of the small-scale and short-term nature of potential night time working associated with the Scheme where birds could potentially be affected, there would be no adverse effect on integrity as a result of disturbance / displacement from night time working.

7.4.16 Any night working would be agreed in advance with the local authority, and any restrictions outlined within the final CEMP and REAC. The CEMP and the REAC would be finalised by the Contractor once appointed prior to construction commencing and would be submitted to the Secretary of State for approval as part of the discharge of the DCO Requirements process. Natural England would be consulted on the CEMP and REAC as part of the DCO Requirement discharge process.

Construction Phase Lighting Scheme

7.4.17 The site lighting scheme for the construction phase is set out within Chapter 2: Description of the Scheme (document reference TR010035 /APP/6.2) and would

generally be required as follows:

- Provision of lighting for contractor's compounds for security and safe movement of staff during winter mornings and evenings
- Provision of road lighting along temporary access roads
- Provision of temporary road lighting to maintain at least an equivalent level of lighting where there is existing lighting in place prior to construction
- Provision of temporary road lighting where there is currently no lighting, as lighting is required as a safety measure under temporary traffic management
- Provision of task lighting required for night time activities or winter afternoon activities, such as installation of bridge beams

7.4.18 All lighting would be directional and include baffles to prevent light spill onto adjacent land. The only lighting at night (apart from during night time working, see above) would comprise security lighting around the contractor's compounds. All lighting requirements would be set out within the CEMP and REAC, and the Contractor would be required to undertake light modelling to ensure no increase in light spill above that identified for the designed Scheme. Any potential disturbance/ displacement effects associated with construction phase lighting would be negligible and not significant.

Additional Drainage Works

7.4.19 Pink-footed geese, lapwing and little egret have been recorded within Land Parcel 13 (Survey Area 3). This area is outside of the construction works, but works may be required in this field to maintain the drainage ditch which takes run off from the existing highway network. Chapter 2: Description of the Scheme (document reference TR010035/APP/6.2) indicates that works to the drain would be small-scale and short-term, comprising vegetation removal and clearance in the bed of the ditch to maintain the flow, and works to the tidal flap valve. The works would be done by hand, or with small machinery, and would usually take place in good weather conditions, outside of the winter period. However, if works are required during the winter period, the Ecological Clerk of Works (ECoW) for the Scheme would ensure appropriate measures are taken to avoid potential impacts on SPA/Ramsar site bird species. Appropriate pollution prevention measures would also be implemented, where necessary, to ensure the protection of water quality during the works. This would include measures in line with CIRIA guidance. All restrictions associated with carrying out the drainage works would be outlined within the CEMP and REAC. Given the small-scale and short-term nature of the works (should they be required), any potential disturbance/ displacement effects would be negligible and not significant.

<u>Construction Noise and Visual Effects</u>

7.4.20 The construction process would be phased, with different elements of the Scheme being completed at different times depending on the complexity of construction, and measures to keep traffic moving safely through the work sites. The potential for impacts would therefore vary throughout the construction period, and birds utilising land within or adjacent to the Scheme would not necessarily be affected for the entire duration of the construction phase.

7.4.21 The following Section looks at each of the 4 species and the overwintering bird assemblage screened into the AA in relation to the potential noise and visual disturbance associated with construction activities within 300m of the Scheme.

Pink-footed Geese, Curlew and Lapwing

7.4.22 Taking the buffer of 300m from the edge of the construction works within which potential noise disturbance could occur (as agreed with Natural England, refer to paragraph 7.4.4), the results of the bird surveys show (Table 16) that throughout the 2 year survey period there were 8 records of 1% or greater of the SPA population of pink-footed geese located in fields which could be subject to noise and visual disturbance during the construction phase (refer to Appendix 1, Figure 3, Sheet 2). The birds were concentrated at the eastern end of the Scheme within Land Parcels 8, 10 and 11 (Bird Survey Area 2), but only on a small number of occasions. The remaining records were located over 300m from the from the edge of the construction works, with the majority of the records over 1% of the SPA population located within, or immediately adjacent to Bird Survey Area 6 (the River Wyre). Information obtained with regard to the crop type at the time of the bird surveys indicates that the pink-footed geese recorded during the bird surveys were predominantly utilising pasture as a foraging resource, rather than arable crops.

7.4.23 In a similar manner to pink-footed geese, the majority of records of curlew and lapwing have been recorded within the River Wyre (Bird Survey Area 6). Looking at those records within the buffer of 300m from the edge of the construction works, there were only 2 records of curlew above the 1% SPA population threshold (refer to Appendix 1, Figure 4, Sheet 2), and 4 records of lapwing above the 1% Ramsar site population (refer to Appendix 1, Figure 5 Sheet 2). All of these records were from 3 Land Parcels (refer to Table 16).

Table 16: Pink-footed Geese, Curlew and Lapwing (records of 1% or greater of the SPA/Ramsar site population) within 300m of the Construction Works

Species	No. of birds	Land parcel	Survey Area
Pink-footed goose	625	22	5
	500	10	2
	260	10	2
	1,500	11	2
	600	8	2
	160	13	3
	400	13	3
	160	10	2
Curlew	120	25	5
	124	5	1
Lapwing	320	25	5
	200	25	5
	450	18	4
	280	5	1

7.4.24 Over the 2-year period, 14 flocks of SPA/Ramsar site species comprising 1% or greater of their qualifying populations were recorded within 300m of the

construction works, equating to less than 3% of the total number of bird observations on the ground over 2 years.. The most recent information from the Goose and Swan Monitoring Programme (Mitchell, C. and K. Brides, 2017) shows that the wintering pink-footed goose population within the UK is continuing to grow, and this trend is shown in the increase in the wintering populations in the northwest (the most recent BTO WeBS data for Morecambe Bay (Frost *et al.*, 2017) shows that the 5 year average population (2012/13 to 216/17) is now 25,490 compared to 15,648 (2009/10 to 2013/14), refer to Table 4). Although both curlew and lapwing have shown population decreases within the SPA in recent years (but are now stable), this is following the regional and national trends for these species (Frost *et al.*, 2017), rather than as a result of localised conditions.

7.4.25 Whilst it is considered unlikely that the short-term disturbance / displacement effects of the construction works would be detrimental to the fulfilment of the conservation objectives for the SPA/Ramsar site, such an effect cannot be ruled out. Therefore, mitigation would be put in place to provide an alternative foraging / roosting area for these birds for the duration of the construction work in order to mitigate for any disturbance / displacement effects that may occur during the construction phase. By providing an alternative suitable foraging area for birds nearby, no effect on the integrity of the SPA / Ramsar site would occur and no additional mitigation for disturbance / displacement would be required.

Little Egret

7.4.26 As discussed in Section 6.6, all observations of little egret represent 1% or greater of the SPA population.

7.4.27 Little egret were recorded across the Bird Survey Area, using a variety of habitat to forage and roost. Taking the buffer of 300m from the edge of the construction works, the results of the bird surveys show (Table 17) that there were 36 records of 1% or greater of the SPA population located in fields which could be subject to noise and visual disturbance during the construction phase. Twenty of the 36 records related to individual birds; with the remaining 16 records of less than 7 birds, indicating use by a small number of individuals on an irregular basis. The majority of little egret records were outside of the 300m buffer within and adjacent to the River Wyre (Bird Survey Area 6), with the peak counts of little egret recorded in Survey Area 6.

Table 17: Little Egret (records of 1% or greater of the SPA population) Within 300m of the Construction Works

No. of birds	Number of records	Land parcel	Survey Area
1	1	5	1
	1	6	1
	4	11	2
	1	13	3
	1	22	5
	2	23	5
	6	24	5
	3	25	5

	1	26	6
2	1	8	2
	1	19	4
	2	22	5
	2	23	5
	2	25	5
3	2	23	5
	2	24	5
	2	25	5
5	1	24	5
7	1	10	2

7.4.28 The most recent BTO information (Frost *et al*, 2017) shows that the little egret population is increasing year-on-year, with Morecambe Bay supporting the 8th largest population of little egret in the UK (154 birds 5-year average 2010/11 – 2015/16). The population within the SPA is likely to continue to increase as the UK population expands northwards. As such, the current calculations based on 1 bird being considered to be 1% or greater of the SPA population provides a very precautionary approach to assessing the potential impacts upon this species.

7.4.29 Unlike pink-footed geese, curlew and lapwing which forage in large flocks, little egret are generally more solitary or recorded in small groups. It is therefore, likely that several of the records relate to the same 1 or 2 birds utilising habitats within the survey areas across the season. Although a peak count of 7 birds was recorded on 1 occasion, the majority of the records related to between 1-3 birds. The habitat requirement for this species is more versatile than for geese and waders which require large open areas with suitable foraging resources. Little egret were observed using a wide range of habitats including the ditch network, field ponds, scrapes and floodwaters across the survey area. The majority of the permanent wetland features used by the little egret population recorded would not be affected by the work and in many cases such features are screened by bankside vegetation which would reduce the level of noise and visual disturbance experienced at these locations during the construction phase of the Scheme.

7.4.30 It is therefore, not anticipated that any effects from disturbance/displacement during the construction phase of the Scheme would be significantly detrimental to integrity of the little egret population within the SPA. Nor would this affect the ability of the little egret population of the SPA to survive at their current conservation status. Therefore, no specific mitigation for little egret is proposed. NE is in agreement of the rationale for screening out impacts on little egret (consultation response June 2018). However, the mitigation measures put in place for curlew and lapwing (including the provision of scrapes), would provide suitable alternative foraging habitat for this species during the construction phase.

Overwintering Waterbird Assemblage

7.4.31 Birds which could make up the overwintering waterbird assemblage associated with the SPA/ Ramsar site were recorded throughout the winter surveys (refer to Table 5, and Appendix 3). Excluding those species already discussed as individual qualifying species in the previous section, the bird survey results indicate that the majority of birds which would constitute the waterbird assemblage were recorded

utilising the River Wyre and adjacent habitats (Bird Survey Area 6). The largest aggregations of birds were recorded on the mudflats within and adjacent to the River Wyre, outside of the 300m buffer from the edge of the Scheme.

7.4.32 In order to determine whether the area within 300m of the Scheme supported 1% or greater of the overwintering waterbird assemblage population, the peak count of each waterbird species (excluding gulls) utilising the habitats within 300m of the Scheme, was calculated (refer to Table 18). Note that the peak count relates to records of birds on the ground, flight records have been excluded from the calculation. This method for calculating the waterbird assemblage was agreed in consultation with Natural England (email correspondence, 17 May 2018).

Table 18: Waterbird Assemblage Species within 300m of Scheme – Peak Counts and % of SPA population where a species exceeds national importance threshold* (species name shown in bold).

Note: Species shown in *italics* are assessed as individually qualifying species so are only included here as part of the overall assemblage

Species	Peak Count 2016-17	% of SPA population*	Peak Count 2017-18	% of SPA population*
Black-tailed godwit			5	
Coot	1			
Cormorant	3	0.3	2	0.2
Curlew	124		120	
Gadwall			4	
Golden plover			3	
Greylag goose			79	
Grey heron	1			
Kingfisher			1	
Lapwing	90		320	
Little egret	7		3	
Mallard	18		34	
Moorhen	1			
Mute swan			2	
Oystercatcher	3		6	
Pink-footed goose	1,500		600	
Pintail			2	
Redshank	3		13	
Snipe	6		50	
Shelduck	9		7	
Shoveler			4	
Teal	22	0.6	70	1.8
White-fronted goose			1	
Whooper swan		-	5	2.9
Wigeon			8	
Woodcock	2		1	
Total	**1,790**		**1,340**	

7.4.33 The winter waterbird assemblage for the Morecambe Bay and Duddon Estuary SPA is cited as 266,751 birds (based on the 5-year peak mean 2009/10–2013/14) and the Morecambe Bay Ramsar site citation states 223,709 birds (based on the 5-year peak mean 1998/99–2002/03). Given that the SPA includes the most recent data for the region, it was considered appropriate to take 1% or greater of the SPA population as the threshold against which to assess the results: 1% of 266,751 equates to 2,667 birds.

7.4.34 The combined peak count of each species of waterbird present within 300m of the Scheme did not exceed 1% or greater of the SPA assemblage (i.e. 2,667 birds) during either the 2016-17 or 2017-18 winter bird surveys. The combined total of peak counts for the whole of the 300m buffer was 1,790 birds in 2016-17 and 1,330 birds in 2017-18 which equates to 0.7% and 0.5% of the SPA population respectively.

7.4.35 Three of the waterbird assemblage species recorded within 300m of the Scheme were considered to be of national importance, these comprised cormorant, teal and Whooper swan. Cormorant and teal were recorded during both survey seasons. A peak count for cormorant of 3 in 2016-17 and 2 in 2017-18 representing 0.3% and 0.2% of the SPA population respectively (based on 2012/13-2016/17 5-year average peak count of 1024, (British Trust for Ornithology (BTO), 2019)). The peak counts for teal of 22 in 2016-17 and 70 in 2017-18 representing 0.6% and 1.8% of the SPA population (based on 5-year average peak count 3,915). In total, five flocks of teal comprising 1% or greater of the SPA population were recorded during 2017-18 one of which was within the Scheme boundary, with the remaining four records associated with a pond in Land Parcel 12, 200m to the north east of the Scheme. This indicates occasional use and alternative suitable waterbodies were available within the same field at a greater distance from the Scheme (over 300m away) where larger flocks were recorded so any impacts associated with disturbance in this location would be minimal. Whooper swan were only recorded on a single occasion during the second survey season when 5 birds (equivalent to 2.9% of the 5-year average peak count of 175) were observed in Land Parcel 25. Whooper swan are therefore considered to only use the affected habitats on a very sporadic basis and therefore a significant effect in terms of disturbance would not occur.

7.4.36 All of the species associated with the waterbird assemblage were more frequently recorded utilising the estuarine habitats away from the Scheme.

7.4.37 Given that the birds associated with the waterbird assemblage were mainly recorded using the River Wyre (Bird Survey Area 6), and the species present within the SPA in nationally important numbers were not regularly and frequently recorded utilising habitats within or adjacent to the Scheme it is not anticipated that any effects from disturbance/displacement during the construction phase of the Scheme would be detrimental to the integrity of the overwintering waterbird assemblage population within the SPA/Ramsar site. Nor would this affect the ability of the birds associated with the waterbird population of the SPA/Ramsar site to survive at their current conservation status. Therefore, no specific mitigation for the waterbird assemblage is proposed. However, the mitigation measures put in place for pink-footed geese, curlew and lapwing (including the provision of scrapes and pasture for foraging and roosting), would provide suitable alternative foraging

habitat for other species associated with water bird assemblage during the construction phase.

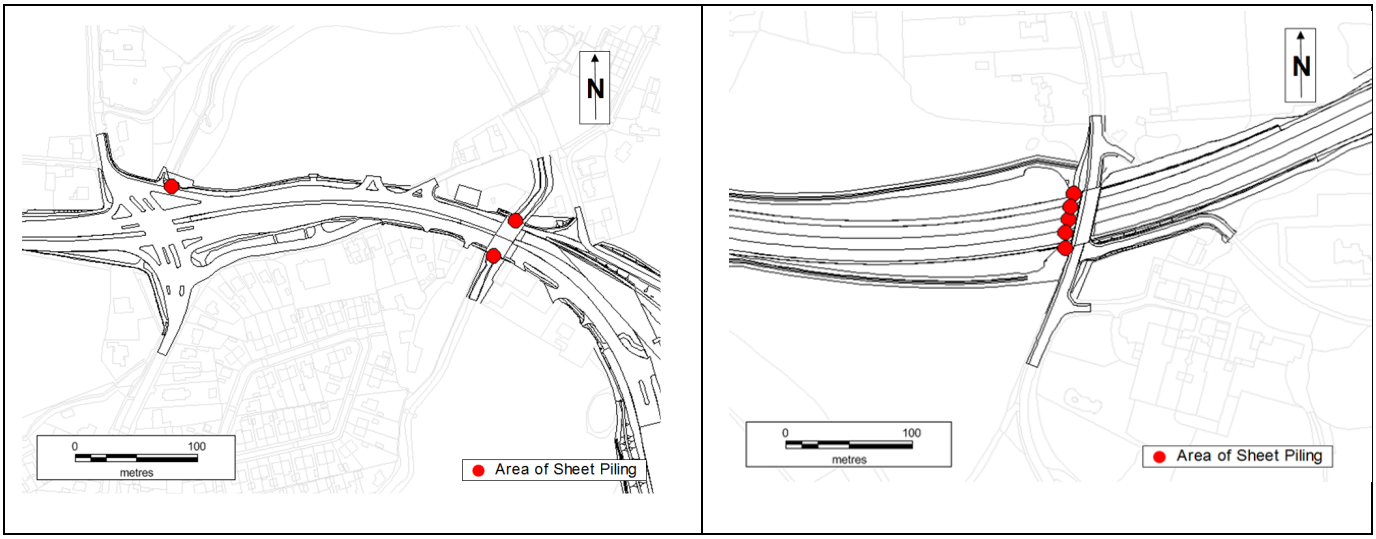
Vibration Effects

7.4.38 The only activities with the potential for vibration impacts would be associated with piling during construction. The areas where vibration sheet piling would be undertaken have been identified from Appendix 2.1: Construction Information (document reference TR010035/APP/6.2.1) as:

- Skippool Clough Culvert north end - temporary sheet piling coffer dam in tidal section of Horsebridge Dyke (August / September outside of winter)
- New Skippool Bridge - temporary sheet piling on both sides of Main Dyke forming piling platform for installation of piles for new bridge abutments and northeast wing wall. Applies to north half of bridge and south half of bridge (August / September – 30 days)
- Lodge Lane diversion - possible temporary sheet piling on east side of temporary diversion (25 days – November and December)

7.4.39 These are shown on insert 7-1.

Insert 7 1: Locations of vibration sheet piling



7.4.40 Curlew have been recorded on 2 occasions in the vicinity of the Skippool Creek Culvert, however, the records related to a single bird in 2016-17 and 2 birds in 2017-18. In addition, the indicative programme indicates that this work would be undertaken outside of the winter period, and therefore potential impacts from piling at this location can be ruled out.

7.4.41 The New Skippool Bridge is surrounded by existing development and is enclosed by scrub and gardens. No SPA/Ramsar site birds were recorded utilising the bridge location or habitats directly adjacent to it. In addition, the piling works in this location are proposed to be undertaken during August/September and would therefore occur outside of the wintering bird period. Potential impacts from piling at this location can therefore be ruled out.

7.4.42 Similarly, no SPA/Ramsar site species were recorded in the vicinity of the Lodge Lane works, with the closest records being over 250m to the west or southwest. Given the absence of birds close to the proposed piling works at this location, potential impacts can be ruled out.

Summary

7.4.43 The above assessment indicates that there would be no adverse effects on the integrity of the European sites associated with vehicle movements and access routes, changes to public footpaths, the lighting scheme, or night-time working. There are, however, a number of locations where pink-footed geese, lapwing and curlew could be affected by noise and visual disturbance/displacement from the construction works themselves. Although unlikely, the potential for adverse effects on the integrity of the SPA/Ramsar site cannot be ruled out, and therefore mitigation, would be implemented during the construction phase to provide alternative feeding habitats for these species. No specific mitigation measures are required for little egret, or the over-wintering waterbird assemblage, however the alternative feeding habitats provided will also be of benefit to these species. By providing alternative feeding areas away from the construction works, there would be no adverse effect on the integrity of the SPA/Ramsar site as a result of potential disturbance / displacement effects and no further mitigation in relation to noise impacts upon avian receptors is required.

Loss of Foraging and Roosting Habitat Under the Footprint of the Construction Works

7.4.44 The Scheme would require the temporary loss of approximately 48ha of farmland habitat in order to facilitate the construction works (inclusive of the finished footprint of the Scheme).

7.4.45 The bird surveys show that pink-footed geese, curlew and lapwing are using farmland within and adjacent to the Scheme in numbers exceeding 1% of the SPA/Ramsar site populations (refer to Table 3, Section 5). Therefore, there would be a small loss of this foraging habitat as a result of the Scheme. Little egret were predominantly recorded foraging on the drains and field ditches, ponds or floodwater, and as such, the loss of farmland would not affect this species in the same way as it could affect the foraging geese and waders.

7.4.46 Table 19, below, shows the size of the fields within 300m of the construction works where records comprising 1% or greater of the SPA/Ramsar site species were recorded. For each field, the number of 1% or greater flocks recorded within each field; the number of birds associated with each record; and the year that they were recorded is also provided. It also shows the area of the fields supporting SPA/Ramsar site species that would be lost under the footprint of the construction works.

Table 19: Fields Within 300m of the Construction Area Supporting SPA/Ramsar Site Species and Area of Associated Temporary Habitat Loss

Field No. (Figure 7)	Size of field (Ha)	Area of temporary loss (Ha)	Species	No. of records	No. of birds	Year of record
1	5.83	0	Pink-footed goose	1	160	2017/18
2	3.1	0	Pink-footed goose	2	500	2016/17
					600	2017/18
3	2.66	0	Pink-footed goose	1	260	2016/17
4	2.14	0	Pink-footed goose	1	160	2017/18
5	9	0	Pink-footed goose	1	400	2017/18
6	4.84	2.3	Pink-footed goose	1	625	2016/17
7	9	0	Pink-footed goose	1	1500	2016/17
8	8.64	2.4	Curlew	2	124	2016/17
			Lapwing		280	2016/17
9	4.22	2.4	Curlew	3	120	2017/18
			Lapwing		200	2017/18
					320	2017/18
10	2.5	0	Lapwing	1	400	2016/17

Pink-footed Geese, Curlew and Lapwing

7.4.47 Figure 3, Appendix 1, shows that the 8 flocks of geese exceeding 1% of the SPA population within 300m of the Scheme were recorded within 7 fields across the Bird Survey Area. Four of the fields were within Area 2 (Fields 1, 2, 3 and 7), 2 fields in Area 3 (Land Parcel 13) and 1 field in Area 5 (Land Parcel 22). Bird Survey Area 2 was the only part of the Scheme where flocks were recorded across both seasons with 3 records from 2016-17 and 2 from 2017-18. A second field in Area 5 was The field in Bird Survey Area 5, where only 1 large flock of pink-footed geese were recorded, in late March 2017, was the only field supporting SPA species that would be directly affected by the construction works, with the loss of 2.3 ha of this field. The remaining observations were within fields adjacent to the Scheme and therefore would only be subject to the impacts associated with disturbance/displacement, as described above.

7.4.48 Figures 2 and 3 in Appendix 1 also shows that the 2 flocks of curlew and 4 flocks of lapwing exceeding 1% of the SPA/Ramsar site population within 300m of the construction works were recorded in just 3 fields. One field in Bird Survey Area 5 (Land Parcel 25) in which 1 curlew and 2 lapwing flocks were recorded, 1 field in Area 1 (Land Parcel 5) in which 1 curlew and 1 lapwing flock was recorded and 1 field in Bird Survey Area 4 (Land Parcel 18) with 1 flock of lapwing identified. Again, the only field to be lost as a result of the construction works would be the field in Bird Survey Area 5 with a total of 2.4 ha of this field being either under the

footprint of the new road, or forming part of the landscape planting associated with the Scheme. The remaining observations within Bird Survey Area 4 (150m to the north of the Scheme) were in adjacent fields and therefore would only be subject to the impacts associated with disturbance/displacement, as described above.

7.4.49 Whilst the habitats beneath and adjacent to the Scheme represent potentially suitable foraging habitat for pink-footed geese, curlew and lapwing, the limited number of observations over the 2-year survey period indicates that the fields are not of particular value to these species, and are used only on a sporadic basis. Less than 5 ha of habitat shown to have occasional use by SPA/Ramsar site species during the bird surveys would be lost as a result of the Scheme, and as such, it is considered that any direct habitat loss associated with the Scheme would not significantly reduce the available foraging habitat for species associated with the SPA/Ramsar site. Specific mitigation for loss of habitat is therefore not proposed. However, the mitigation measures put in place for disturbance/displacement during the construction phase of the Scheme, would provide suitable alternative foraging habitat for pink-footed geese, curlew and lapwing during the construction phase.

Little Egret

7.4.50 As described in Section 5, little egret were observed using a wide range of habitats including the ditch network, field ponds, scrapes and floodwaters across the Bird Survey Area. The majority of the permanent wetland features (such as Main Dyke) observed to be used by little egret during the bird surveys would not be directly affected by the Scheme. Although 7 field ditches would be affected due to the requirement to culvert ditches that pass under the Scheme, only very small sections would be effectively lost during the construction period (as set out within the Outline CEMP (document reference TR010035/APP/7.2 – Rev 1) and REAC (document reference TR010035/APP/7.3 – Rev 1)), ditch crossings to allow access to the construction site would be minimised by using existing crossings. A buffer of up to 10m would be maintained to either side of retained ditches which contain water to reduce any potential direct or direct impacts on the species and habitats associated with them.

7.4.51 Therefore, it is not anticipated that any effects from habitat loss during the construction phase of the Scheme would be significantly detrimental to integrity of the little egret population within the SPA. Nor would this affect the ability of the little egret population of the SPA to survive at their current conservation status. Therefore, no specific mitigation for little egret is proposed. However, the mitigation measures put in place for curlew and lapwing in relation to potential disturbance effects (including the provision of scrapes), would provide suitable alternative foraging habitat for this species during the construction phase.

Waterbird Assemblage

7.4.52 Only two of the species associated with the waterbird assemblage and present within the SPA in nationally important numbers were recorded within habitats that would be affected by the Scheme. One record of 60 teal and one record of 5 Whooper swan were recorded during the 2017-18 surveys both of which represented 1% or greater of the SPA population. Both records related to the same field in Land Parcel 25 in which a flock of lapwing was also recorded. As

such, no additional loss of foraging habitat over and above that already assessed in relation to individually qualifying SPA species would occur. Given the very limited use of the habitats affected by the Scheme by the wider waterbird assemblage, any effects from habitat loss during the construction phase of the Scheme would not affect the integrity of the waterbird population, nor would it affect the ability of the nationally important species within the assemblage to survive at their current conservation status. Therefore, no specific mitigation for the waterbird assemblage is required. However, the mitigation measures put in place for pink-footed geese, curlew and lapwing in relation to potential disturbance effects (including the provision of scrapes), would provide suitable alternative habitat that could be utilised by birds associated with the waterbird assemblage during the construction phase.

Summary

7.4.53 The above assessment indicates that whilst there would be a small amount of habitat loss as a result of the construction phase of the Scheme, the potential impact would not be significant, and no specific mitigation measures are required.

Water Quality

7.4.54 The water quality assessments undertaken as part of the ES for the Scheme identified the potential for negative effects on water quality of the River Wyre and its associated tributaries, due to receipt of construction site runoff and potential for reduced flow conveyance capacity (particularly on the Main Dyke) due to sedimentation (refer to Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12). The Main Dyke feeds directly into the River Wyre, which is within the boundary of the SPA/Ramsar site (refer to Figure 2). The construction of the new road would require new structures including replacement of Skippool Clough culvert and Skippool bridge over Environment Agency main rivers as well as the extension of 2 existing ditch culverts. The new offline section of the Scheme would also be required to cross 5 ditches which feed into the Main Dyke. In order to offset any potential water quality impacts on the adjacent SPA/Ramsar site (and its associated waterbird assemblage) during the construction phase associated with these works, a suite of mitigation measures would be developed and agreed with the EA and Natural England. Environment Agency consent and a Flood Risk Activity Permit (FRAP) would also be required for the works. All measures are would be set out within the CEMP prepared by the Contractor.

7.4.55 The measures set out within the CEMP would ensure the quality of the water environment does not deteriorate during construction of the Scheme. The CEMP would include best practices for the management of environmental impacts during construction. An Outline CEMP has been prepared (document reference TR010035/APP/7.2 – Rev 1) together with a REAC (document reference TR010035/APP/7.3 – Rev 1). The Outline CEMP and REAC require a Pollution Control Plan to be prepared by the Contractor prior to the start of construction to safeguard the quality of surface water and groundwater and the downstream designated SPA / Ramsar site, drawing on best practices and relevant CIRIA publications. These include CIRIA (2001) Control of water pollution from construction sites: guidance for consultants and contractors (C532) and CIRIA (2015) Environmental Good Practice on Site (C741). The specific details of the

mitigation measures would be set out within the Pollution Control Plan which would be agreed in consultation with the Environment Agency and Natural England. A draft Pollution Plan is appended to the Outline CEMP (Appendix G, document reference TR010035/APP/7.2 – Rev 1). The draft Pollution Control Plan outlines the potential pollution sources and mitigation measures to be employed. These include measures such as provision of temporary cut-off drains, settlement ponds, screens and bunds, as well construction of a cofferdam above the mean highwater mark to prevent wash-out (for the construction of Skippool Clough Culvert). Daily inspections will be carried out to ensure that these, and other measures outlined in the draft Pollution Control Plan are maintained throughout the construction period. Measures will be put in place to rectify any changes required. The preparation of the final Pollution Control Plan is secured through Requirement 4 of the draft DCO (document reference TR010035/APP/3.1).

Summary

7.4.56 The above assessment indicates that whilst the mitigation measures to protect water quality across the construction site would be sufficient to avoid adverse impacts on Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site, additional mitigation measures would be required (refer to Table 20) to avoid adverse effects on the integrity of Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site and the associated qualifying species (including the waterbird assemblage) (as outlined within the draft Pollution Control Plan (Appendix G, document reference TR010035/APP/7.2).

7.5 In Combination Effect

7.5.1 The in-combination assessment (refer to Sections 5.10 and 5.11) determined that there was the potential for in combination effects associated with the Scheme and development within the Fleetwood – Thornton AAP. The 2 potential in combination impacts comprised:

- Disturbance to bird populations during construction works
- Contamination from emissions to water as a result of increased industrial use or increased housing density

Disturbance

7.5.2 For any new developments which comes forward within the AAP, the HRA of the AAP and the HRA of the emerging Wyre Local Plan, includes potential measures to mitigate for disturbance from human activity, including measures such as providing visual screen/ and or fencing around sensitive area known to be used by SPA/ Ramsar site species, restricting access to the foreshore, and restricting the use of security lighting. The current Scheme also includes mitigation for disturbance/ displacement during the construction phase. It is therefore considered unlikely that there would be any significant adverse in combination effects associated with the current Scheme and any new development which takes place within the AAP during the construction phase of the Scheme.

Water Quality

7.5.3 For any new developments which comes forward within the AAP, the emerging Wyre Local Plan and the HRA of the AAP includes reference to protecting water

quality. The HRA of the Wyre Local Plan states that:

7.5.4 'Appropriate pollution prevention measures would be incorporated into any new development at the site to reduce/ eliminate the potential impacts associated with contamination. Any forthcoming planning applications would need to follow strict water quality/pollution prevention measures (in particular those located directly adjacent to the European sites). This would include meeting policy CDMP4 which requires development not to reduce water quality or diminish the ecological value of the water body or environs, protecting the water quality of existing water resources, such as watercourses, coastal waters and ground waters and not permitting developing likely to damage or destroy habitats or harm species of international or national importance. Policy CDMP2 requires major developments to implement sustainable urban drainage systems (SuDS) or other options for the management of the surface water at source and policy CDMP1 requires development to not have a significant adverse effect on the operation of surrounding uses, with reference to pollution. Development would also have to comply with other legislative requirements such as the Environmental Permitting (England and Wales) Regulations 2010)'

7.5.5 As described in Section 7.4, the current Scheme also includes a suite of measures to protect water quality. It is therefore considered unlikely that there would be any significant adverse in combination water quality effects associated with the current Scheme and any new development which takes place within the AAP during the construction phase of the Scheme.

Conclusion

7.5.6 The in-combination assessment concludes that there would be no adverse in combination affects associated with the current Scheme and any new development which takes place within the AAP during the construction phase of the Scheme. In addition, all new development within the AAP would need to comply with Principle 5 of the AAP. This provides further assurance that the natural environment would be protected, and in combination effects would be unlikely.

7.5.7 'Principle 5 – Protecting the Environment: Careful consideration will be given to the effect of new development on the various nature conservation interests associated with the Area and its surrounding environment including the adjacent European Marine Site together with land associated with the Wyre Estuary which includes nationally and internationally important sites of nature conservation value. Where appropriate, planning applications will be required to be accompanied by appropriate surveys or assessments to assess the direct and indirect impacts of the proposals on habitats and species.'

7.6 Construction Phase Mitigation and Monitoring

Mitigation

7.6.1 The construction phase mitigation measures are set out within Table 20. As discussed in Section 7.4, measures are required to mitigate for potential adverse effects on the bird species associated with the Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site, as a result of potential disturbance/ displacement effect from the Scheme during the construction phase; and to avoid

adverse impacts on water quality associated with the construction phase of the Scheme.

7.6.2 The Mitigation Area, described in Table 20, is located adjacent to the River Wyre, north of the Scheme. This area was specifically chosen as a parcel of land located away from the construction area which would not be affected by disturbance / displacement effects associated with the Scheme. The Mitigation Area was also chosen on the grounds that it would provide a sufficiently large area to support use by SPA / Ramsar site species for the duration of the construction phase. The ecological information collected for the Scheme determined that the Mitigation Area does not currently provide optimal foraging habitat for large numbers of SPA/ Ramsar site species; and therefore, can be improved through management to provide more suitable habitat (as set out within the Bird Mitigation Strategy (appended to the Outline CEMP - document reference TR010035/ APP/7.2)). Although other alternative locations for the Mitigation Area were considered, the final location was determined to be the most suitable site in the vicinity of the Scheme.

Table 20: Construction Phase Mitigation Measures

Potential impact	Mitigation Measures
Visual and noise disturbance (pink-footed geese, curlew and lapwing)	An ecological Mitigation Area (refer to Appendix 1, Figure 7) would be included in the Scheme design (and included in the draft Order Limits). The Mitigation Area would be temporarily acquired by Highways England as essential mitigation and would provide alternative foraging habitat for the duration of the construction period. It is intended that the mitigation would be in place for the birds to use from October 2019. The fields, covering 16.4ha, would be subject to a Bird Mitigation Strategy (appended to the Outline CEMP - document reference TR010035/APP/7.2). Natural England has agreed the size and location of the Mitigation Area (email correspondence, 2 July 2018). The land surrounding the mitigation area to the east and southwest would also be within the ownership of Highways England for the duration of the construction phase (as indicated by the hatching on Figure 7, Appendix 1). No shooting would be permitted in the Mitigation Area for the duration of the construction phase, allowing birds to use the full extent of the Mitigation Area. Although this land would not be specifically managed for SPA/Ramsar site species during the construction phase, it would continue to be farmed, and, as such would be available for birds during this time, should they wish to use it. The specific details of the Bird Mitigation Strategy are still to be finalised in consultation with Highways England and the landowner/tenant farmer. The plan would include measures such as: • Supplementary feeding (pink-footed geese only)

Potential impact	Mitigation Measures
	• Preventing dog walkers from Wyre Way entering the mitigation area • Maintaining the open aspect of the fields • Crop management • Scrub removal around existing wet features to improve their suitability for waders (curlew and lapwing) • Creation of new scrapes (curlew and lapwing)
Water quality	The detailed mitigation measures would be set out within the Pollution Control Plan (to be agreed in consultation with the Environment Agency and Natural England). A draft is appended to the Outline CEMP (document reference TR010035/APP/7.2). The draft plan would be developed by the Contractor and include best practices and measures set out within relevant CIRIA publications, such as: • Protocols for undertaking regular (daily) visual checking of waterbodies located near areas of construction works for changes in water colour, transparency and for signs of oil sheen, scum or foam build up. Measures in place to rectify any changes identified • Avoiding spillages by using screens and bunds around storage tanks to prevent leakages, use of drip trays around mobile plant, designating specific areas for re-fuelling to prevent run off into adjacent waterbodies • Use of a cofferdam at Skippool Clough Culvert above high-water mark to prevent wash-out. • Use of temporary cut-off drains, settlement ponds, silt curtains and fences to prevent run off from entering the Main Dyke and other ditches within the construction area. Adequate scour protection (e.g. rock mattresses, geofabrics) should be provided at points of concentrated discharge to spread flows and reduce velocities minimising damage and mobilisation of sediment • Use of grips, sumps, straw bales and sediment traps may also be installed to capture silt, if required. Each of these should be regularly maintained to ensure that they remain effective (i.e. do not become blocked) and not increase the likelihood of an incident occurring

Monitoring

7.6.3 Monitoring would be undertaken during the construction phase of the Scheme. This would specifically look at the responses of birds to the Scheme in relation to the provision of alternative habitat for pink-footed geese, lapwing, curlew and little egret. The results of the monitoring would be regularly reviewed to ensure that the

mitigation measures for the Scheme continue to be appropriate and effective. Details of the monitoring strategy would be determined in consultation with Natural England.

CEMP

7.6.4 All mitigation and monitoring commitments (set out in both the HRA and the EIA) have been incorporated into a REAC (document reference TR010035/APP/7.3 – Rev 1) which forms an appendix to the Outline CEMP (document reference TR010035/APP/7.2 – Rev 1). A commitment to develop the Outline CEMP into a CEMP fit for construction would be part of the contract documents and would therefore be an Employer's Requirement during the construction of the Scheme. Fulfilment of the mitigation measures and preparation of the CEMP fit for construction are also an obligation under Requirement 4 in the draft DCO (document reference TR010035/APP/3.1).

7.6.5 To assist with the implementation of the mitigation and monitoring of the Scheme, an Environmental Manager would be employed during the construction phase of the Scheme. This individual would be responsible for overseeing the works, ensuring the mitigation measures are implemented, and liaising with statutory and non-statutory organisations in relation to the environmental aspects of the Scheme during its various phases.

7.7 Operational Effects

7.7.1 Following completion of the construction phase, all temporary infrastructure (such as site compounds and working areas), would be removed and habitats restored to their pre-construction state. A comprehensive landscaping strategy would be put in place to integrate the new Highway with the local character of the surrounding landscape and soften the visual impact. In addition, environmental barriers in the form of earth mounding or acoustic fencing would provide screening from increased noise levels during the operational phase. The completed Scheme is shown in the Construction Method Statement.

Potential Displacement/disturbance to SPA/Ramsar Bird Species Utilising Land Adjacent to the Operational Scheme

7.7.2 The wintering bird surveys show that pink-footed geese, lapwing, curlew and little egret, as well as smaller numbers of birds associated with the waterbird assemblage, utilise fields adjacent to existing sources of disturbance/displacement from the existing A585/A586 and nearby infrastructure associated with Skippool and Poulton-le-Fylde (refer to Figures 3 to 6, Appendix 1). Birds currently utilising habitats near to the Scheme are therefore habituated to a higher level of disturbance/displacement than birds utilising more rural locations.

7.7.3 Traffic forecasting and noise modelling undertaken for the Scheme show that noise levels would change as a result of construction of the new road; however, this change is likely to provide a wider beneficial effect to SPA/Ramsar site bird species in the long-term. Although there would be an increase in noise levels in fields adjacent to the new offline sections of the new road (between 0 to 10 dB), this is countered by a decrease in noise levels (between 0 to 10 dB) in fields adjacent to the River Wyre (due to de-trunking of the existing A585 as part of the Scheme) (refer to Figure 11.6 within Chapter 11: Noise and Vibration (document

reference TR010035/AAP/6.11)). Whilst relatively small numbers of birds are using habitats within and adjacent to the new road Scheme (only 14 flocks of 1% or greater of the SPA/Ramsar site population of pink-footed geese, curlew and lapwing were recorded within 300m of the Scheme), the vast majority of birds (and largest flock sizes) were recorded in the areas within and adjacent to the River Wyre. Therefore, the decrease in noise levels in fields close to the SPA/Ramsar site would provide a greater benefit to a larger number of birds compared to a slight increase in noise levels where fewer birds were recorded.

7.7.4 Birds which choose to utilise fields adjacent to the new Scheme would experience an increase in noise levels, however, the relatively small numbers of birds currently utilising habitats near to the Scheme are habituated to a higher level of disturbance/displacement and are likely to become habituated to the new Scheme in the long-term. The completed Scheme would also comprise extensive areas of landscape planting, including new areas of woodland, and planting on the new embankments, and would include new noise and visual screening, as well as sections within a cutting. Acoustic hoarding will also be utilised to minimise noise impacts within parts of the Scheme during the operational phase of the Scheme (locations are presented on the Environmental Masterplan (document reference TR010035/APP/6.19 – Rev 1). All of these features would further act to reduce the potential noise and visual disturbance/displacement from the completed Scheme.

7.7.5 Maintenance works would be required once the road is operational. This would include activities such as resurfacing the carriageway, repairs to damaged assets or their replacement when they approach the end of their life along with routine cleansing and dealing with the results of adverse weather conditions. The majority of these works would take place within the highway boundary but some, including maintenance of the drainage wetland areas and drainage outfalls, would extend beyond the highway boundary.

7.7.6 Safety critical maintenance (such as replacement of damaged safety fence) would have to be carried out at any time of the year. Usually, maintenance activities would take place outside of the winter period, when weather conditions are more favourable. However, on occasions where or maintenance activities are required to take place during the winter months (such as unblocking drainage outfalls), these would generally occur in discrete and relatively limited locations on or adjacent to the new road. Therefore, potential disturbance/displacement effects, associated with maintenance of the completed Scheme, would be negligible.

Summary

7.7.7 Given the measures in place to reduce noise and visual disturbance/displacement, and the results of the traffic forecasting and noise assessments (which shows a decrease in noise levels where the majority of SPA/Ramsar site bird species have been recorded); there would be no long-term effects from disturbance/ displacement of the completed Scheme which would be significantly detrimental to the fulfilment of the conservation objectives for the SPA/Ramsar site. The Scheme could potentially have some net beneficial effects through the decrease in noise levels adjacent to the SPA/Ramsar site.

7.7.8 No mitigation is required for potential displacement/disturbance to SPA/Ramsar bird species during the operational phase.

Loss of Foraging/roosting Habitat

7.7.9 The Scheme would require the permanent loss of approximately 20ha of farmland habitat under the completed Scheme. Table 21 below, shows the size of the fields within which 1% or greater SPA/Ramsar site species flocks were recorded within 300m of the construction works, the number of records within each field, the number of birds associated with each record and the year that they were recorded. It also shows the area of the fields supporting SPA / Ramsar site species that would be lost under the footprint of the completed Scheme.

Table 21: Fields supporting SPA/Ramsar Site Species and Area of Associated Permanent Habitat Loss

Field No. (Figure 7)	Size of field (Ha)	Area of permanent loss (Ha)	Species	No. of records	No. of birds	Year of record
1	5.83	0	Pink-footed goose	1	160	2017/18
2	3.1	0	Pink-footed goose	2	500	2016/17
					600	2017/18
3	2.66	0	Pink-footed goose	1	260	2016/17
4	2.14	0	Pink-footed goose	1	160	2017/18
5	9	0	Pink-footed goose	1	400	2017/18
6	4.84	1.1	Pink-footed goose	1	625	2016/17
7	9	0	Pink-footed goose	1	1,500	2016/17
8	8.64	0.8	Curlew	2	124	2016/17
			Lapwing		280	2016/17
9	4.22	1.8	Curlew	3	120	2017/18
			Lapwing		200	2017/18
					320	2017/18
10	2.5	0	Lapwing	1	400	2016/17

7.7.10 Although a small amount of farmland habitat would be permanently lost under the footprint of the Scheme, only a small proportion of these fields are currently being utilised by 1% or greater of the SPA / Ramsar site species populations or by species of national importance associated with the waterbird assemblage. Of the fields identified as supporting 1% or greater of individual qualifying species (see Table 21) during the bird surveys, less than 4ha (across 3 fields) would be permanently lost along the length of the Scheme. Only two flocks of species of national importance associated with the waterbird assemblage comprising 1% or greater of the SPA population were recorded within habitats that would be permanently lost. Both flocks were recorded in Field 9 during the 2017-18 surveys. Given that the majority of SPA / Ramsar site species (including those associated with the waterbird assemblage) were recorded more regularly utilising fields adjacent to the River Wyre (to the north of the Scheme), there would be no long-

term effects through the loss of this small area of suitable foraging/roosting habitat as a result of the completed Scheme.

Summary

7.7.11 The analysis of the use of the fields by SPA / Ramsar site species has determined that the small-scale loss of less than 4ha would not be significantly detrimental to the fulfilment of the conservation objectives for the SPA / Ramsar site. Nor would this affect the ability of the populations of SPA/Ramsar site species to survive at their current conservation status. Therefore, no mitigation is proposed for the loss of potential roosting/foraging habitat for SPA/Ramsar bird species during the operational phase of the Scheme.

Operational Mitigation and Monitoring

7.7.12 No operational phase mitigation measures are required (as agreed with Natural England, email correspondence 15 June 2018). However, environmental design measures such as balancing ponds, wetland drainage areas; and mitigation for other ecological features, such as great crested newts, would also provide benefits for bird species associated with the SPA / Ramsar site in the long term (details of which are included within the REAC (document reference TR010035/APP/7.3). No long-term monitoring is proposed.

7.8 Appropriate Assessment Conclusion

Conservations Objectives

7.8.1 Table 22 summarises the potential effects of the Scheme in relation to the aims of the Conservation Objective for the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site.

Table 22: Summary of Impacts against Conservation Objectives

Potential impact/ feature	Potential for effect on the Conservation Objectives of maintaining or restoring:					Mitigation required?
	The extent and distribution of the habitats of the qualifying features	The structure and function of the habitats of the qualifying features	The supporting processes on which the habitats of the qualifying features rely	The population of each of the qualifying features	The distribution of the qualifying features within the site	
Disturbance/displacement						
Pink-footed goose	**No** Habitat within the SPA/Ramsar site boundary would not be affected by the Scheme		**No** Supporting processes would not be affected by the	**Yes** More than 1% of the SPA population recorded within 300m of the Scheme		**Yes** (refer to Table 20)
Curlew						
Lapwing						

Potential impact/ feature	Potential for effect on the Conservation Objectives of maintaining or restoring:					Mitigation required?
	The extent and distribution of the habitats of the qualifying features	The structure and function of the habitats of the qualifying features	The supporting processes on which the habitats of the qualifying features rely	The population of each of the qualifying features	The distribution of the qualifying features within the site	
			Scheme			
Little egret	**No** Habitat within the SPA/Ramsar site boundary would not be affected by the Scheme		**No** Supporting processes would not be affected by the Scheme	**No** Although more than 1% of the SPA population recorded within 300m of the Scheme, the majority of the wetland habitats utilised by little egret would not be affected.		**No**
Changes in water quality						
Overwintering waterbird assemblage	**Yes** Installation of new bridge crossing over Main Dyke has the potential to lead to changes in water quality downstream and potentially within the SPA itself which could affect habitats utilised by the waterbird assemblage.			**No** Although water quality could be affected, it is considered unlikely that such impacts would lead to a significant effect upon the waterbird populations.		**Yes** (refer to Table 20)

Conclusion - Construction

7.8.2 Based on the information presented in Section 7.6, Table 23 summarises the potential effects of the Scheme during construction and provides an overall conclusion.

Table 23: Conclusion of the Appropriate Assessment (Construction)

Potential impact	Feature	Mitigation required?	Conclusion
Disturbance to birds using land within and adjacent to the construction works (including construction traffic, noise and visual effects)	Pink-footed goose Curlew Lapwing	Yes (refer to Table 20)	There would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA or Morecambe Bay Ramsar site or on the ability of the site to achieve the aims of the Conservation Objectives (with mitigation in place)
	Little egret Over-wintering waterbird assemblage	No	There would be no adverse effect on integrity of the little egret population associated with Morecambe Bay and Duddon Estuary SPA, or the waterbird assemblage associated with Morecambe Bay and Duddon Estuary SPA or Morecambe Bay Ramsar site or on the ability of the site to achieve the aims of the Conservation Objectives
Direct loss of foraging/ roosting habitat under the footprint of the construction works (temporary)	Pink-footed goose Curlew Lapwing Little egret Over-wintering waterbird assemblage	No	There would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA or Morecambe Bay Ramsar site or on the ability of the site to achieve the aims of the Conservation Objectives.
Change in water quality downstream of the Main Dyke and its tributaries as a result of construction works	Over-wintering waterbird assemblage	Yes (refer to Table 20)	There would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA or Morecambe Bay Ramsar site or on the ability of the site to achieve the aims of the Conservation Objectives (with mitigation in place)

Conclusion - Operation

7.8.3 Based on the information presented in Section 7.6, Table 24 summarises the potential effects of the Scheme during operation and provides an overall conclusion.

Table 24: Conclusion of the Appropriate Assessment (Operation)

Potential impact	Feature	Mitigation required?	Conclusion
Disturbance to birds using land adjacent to the operational road (including noise and visual effects)	Pink-footed goose Curlew Lapwing Little egret	No	There would be no adverse effect on integrity of Morecambe Bay and Duddon Estuary SPA, or on the ability of the site to achieve the aims of the Conservation Objectives.
Direct loss of foraging/ roosting habitat under the footprint of the construction works (permanent)	Pink-footed goose Curlew Lapwing Little egret	No	There would be no adverse effect on integrity of Morecambe Bay and Duddon Estuary SPA, or on the ability of the site to achieve the aims of the Conservation Objectives.

8 OVERALL CONCLUSION

8.1.1 This report considers the likely implication of the Scheme on European sites, and provides information for a HRA as described in Stage 2 of the Inspectorate's Advice note 10 (Version 5).

8.1.2 On the basis of the known presence and distribution of designated interests relevant to the study area (i.e. qualifying features of the Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site), and the likely effects of the Scheme, a 'likely significant effects' test was undertaken to determine the potential for the Scheme activities to influence the designated features of these sites. The results of this screening process are found within the Screening exercise (Section 6). European sites and features screened in for further assessment are shown in Table 11. The remaining designated sites and potential impacts were screened out of the AA. Appendix 4 details the Screening Matrices that summarise the screening assessment.

8.1.3 The AA included within this report represents the next stage of the HRA process after the screening stage. The likely significant effects of the Scheme identified in the screening assessment have been assessed alone and in combination with a range of other Schemes. Mitigation measures both embedded within the Scheme design and additional to this have been identified. Information to inform an AA of potential effects from the Scheme alone and in combination with other plans on the integrity of the sites listed in Table 11 has therefore been provided (see Section 7 of this HRA Report). Appendix 4 details the Integrity Matrices that summarise the AA. The Scheme includes mitigation to off-set the potential minor impacts associated with disturbance / displacement of birds, and loss of foraging / roosting habitat during the construction phase of the Scheme. This includes providing an alternative foraging / roosting area for pink-footed geese, lapwing, and curlew. Impacts on little egret and the waterbird assemblage would not lead to an adverse effect on the integrity of these groups and no specific mitigation measures were considered necessary, although the mitigation provided for pink-footed geese, lapwing and curlew would also provide benefits to other waterbird species. No significant operational phase impacts have been identified.

8.1.4 It is concluded, on the basis of the information provided within this HRA Report, that the Scheme would not prevent Morecambe Bay and Duddon Estuary SPA / Morecambe Bay Ramsar site from achieving their Conservation Objectives, and therefore there would be **no adverse effect on the integrity** of any European sites and features as a result of the Scheme, alone (with mitigation in place as set out in the Outline CEMP – document reference TR010035/APP/7.2, and the associated Bird Mitigation Strategy) or in-combination with other plans and schemes[2]. The need for a further examination of alternative designs, activities and process is therefore not considered necessary.

[2] Note that given there would be no adverse effects on the integrity of the UK based European sites as a result of the Scheme, conversely there would be no adverse effects on the integrity of other Natura 2000 sites outside of the UK which migratory bird species could also utilise at different times of the year.

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10 ABBREVIATIONS

Abbreviation	Term
AA	Appropriate Assessment
AOD	Above Ordnance Datum
BTO	British Trust for Ornithology
CCGT	Combine Cycle Gas Turbine
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
cSAC	Candidate Special Area of Conservation
DCO	Development Consent Order
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
EA	Environment Agency
EC	European Commission
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMS	European Marine Site
EU	European Union
FCS	Favourable Conservation Status
Ha	Hectare
HAWRAT	Highways Agency Water Risk Assessment Toolkit
HRA	Habitats Regulations Assessment
IROPI	Imperative Reasons of Overriding Public Interest
LSE	Likely Significant Effects
pMCZ	proposed Marine Conservation Zone
MWe	Megawatt Electrical
NSIP	Nationally Significant Infrastructure Project
OCGT	Open Cycle Gas Turbine
PPG	Pollution Prevention Guidelines
PRoW	Public Rights of Way
pSPA	Potential Special Protection Area
PWD	Preston Western Distributer
RIS	Road Investment Strategy
RBS	Route Based Strategy
SAC	Special Area of Conservation
SCI	Site of Community Importance
SIP	Site Improvement Plan
SPA	Special Protection Area
SoS	Secretary of State
SNCB	Statutory Nature Conservation Bodies
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
VP	Vantage Point
WeBS	Wetland Bird Survey

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APPENDIX 1 - Figures

Figure 1: Scheme Location, Survey Areas

Figure 2: Designated Sites

Figure 3 (Sheet 1): Pink-footed Geese Ground Records (all ground records)

Figure 3 (Sheet 2): Pink-footed Geese Ground Records (1% SPA population records)

Figure 4 (Sheet 1): Curlew Ground Records (all ground records)

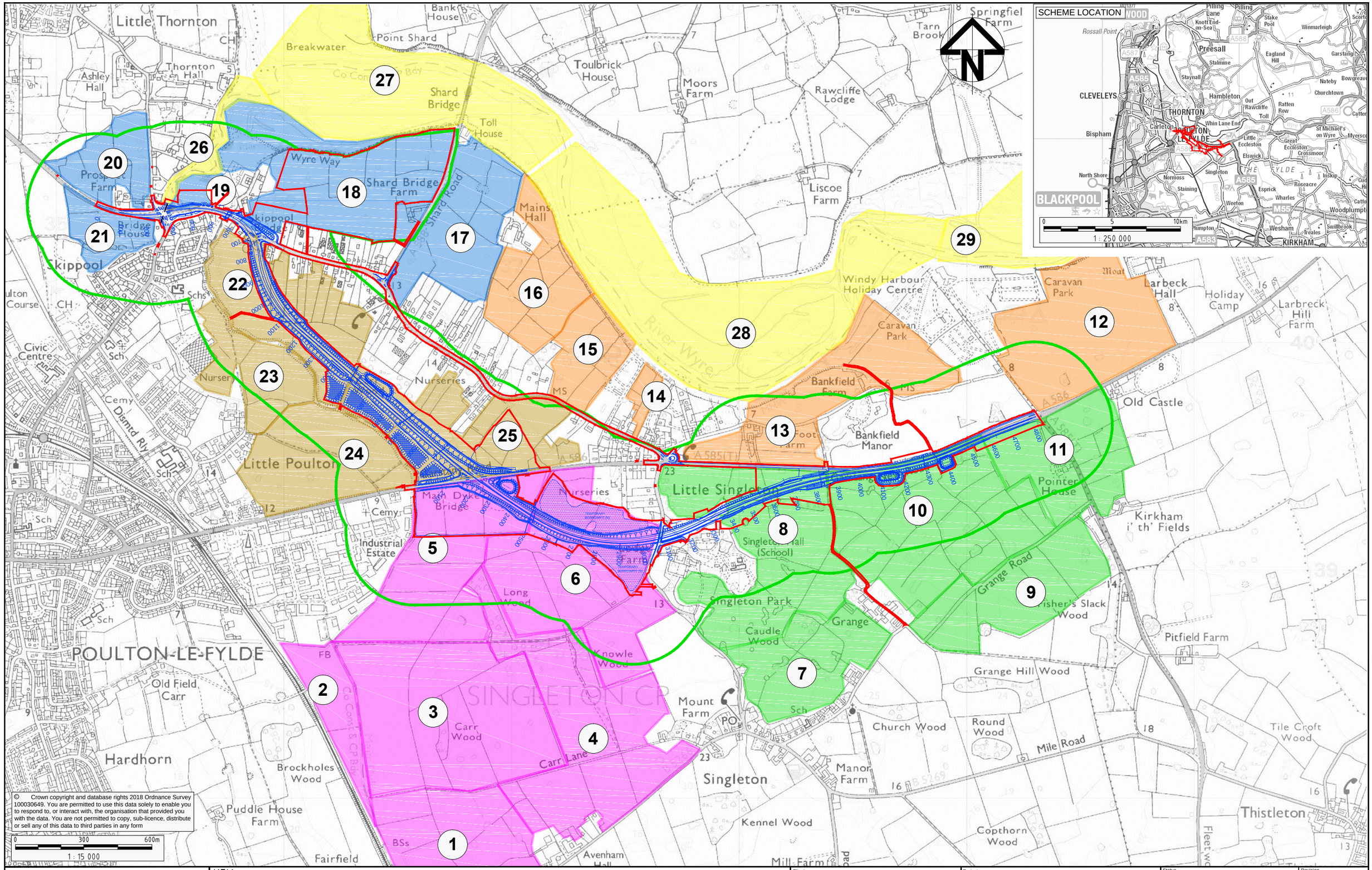
Figure 4 (Sheet 2): Curlew Ground Records (1% SPA population records)

Figure 5 (Sheet 1): Lapwing Ground Records (all ground records)

Figure 5 (Sheet 2): Lapwing Ground Records (1% Ramsar site population records)

Figure 6 (Sheet 1): Little Egret Ground Records (all ground records)

Figure 7: Fields Supporting 1% Threshold SPA/ Ramsar Site Species and Mitigation Area



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0 300 600m
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0 SS OCT18 S8 - DCO SUBMISSION JN KB NH
Rev Status Rev. Date Purpose of revision Drawn Chck'd Apprv'd

KEY:

- Draft Order Limits
- The Scheme
- Construction Area 300m Buffer
- (1) Land Parcel Number
- Bird Survey Area 1
- Bird Survey Area 2
- Bird Survey Area 3
- Bird Survey Area 4
- Bird Survey Area 5
- Bird Survey Area 6

Client: highways england

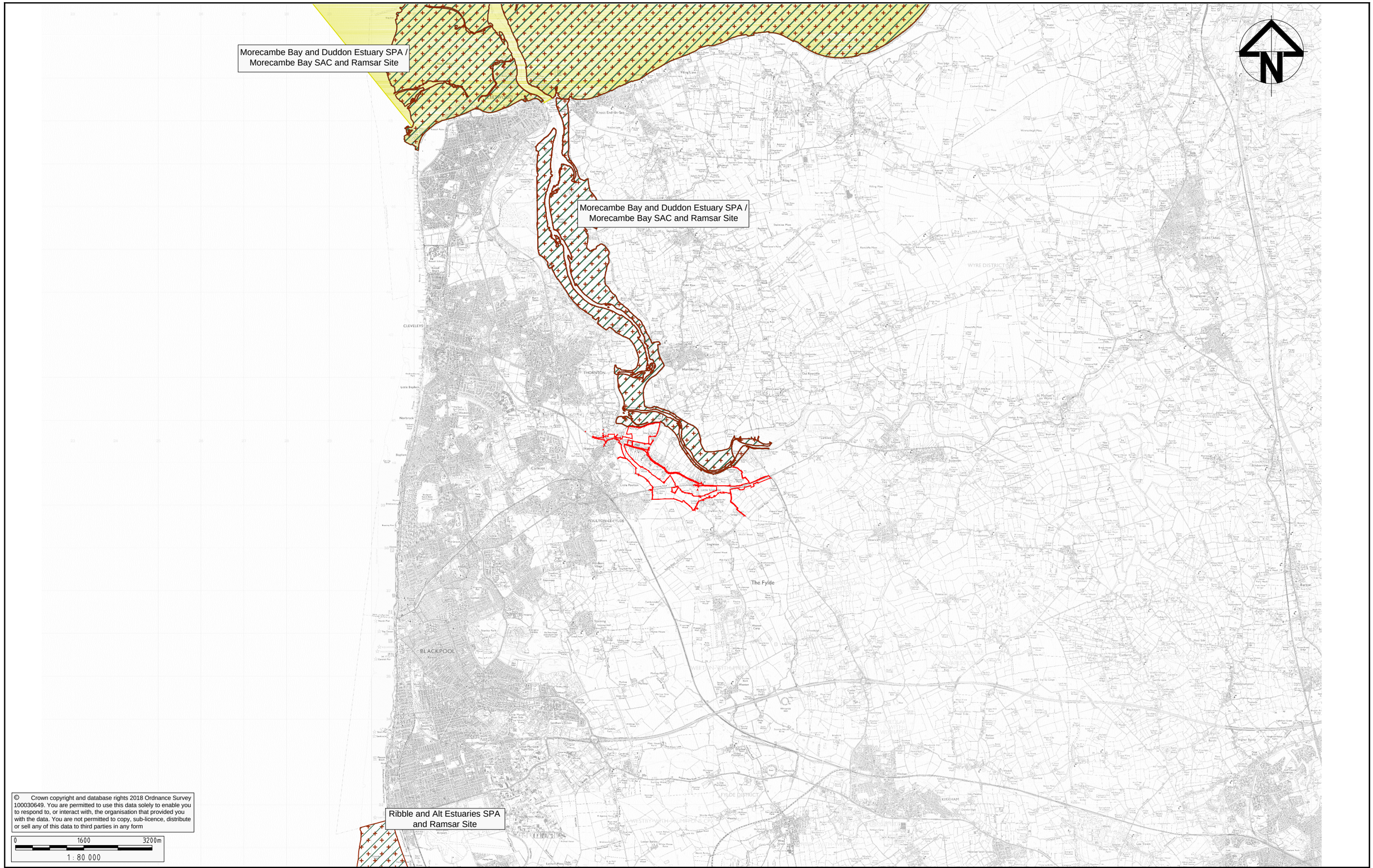
Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

SCHEME LOCATION, SURVEY AREAS AND LAND PARCEL NUMBERS

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:15 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 1

Drawing number (HE PIN | Originator | Volume | Location | Type | Role | Number): HE548643-A585-EAC-SZ_GN000-DR-L-3083



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0 1600 3200m

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KEY:

- Draft Order Limits
- Ramsar Site
- Special Protection Area (SPA)
- Special Areas of Conservation (SAC)

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

DESIGNATED SITES

Status	S8 - DCO SUBMISSION	Revision	0
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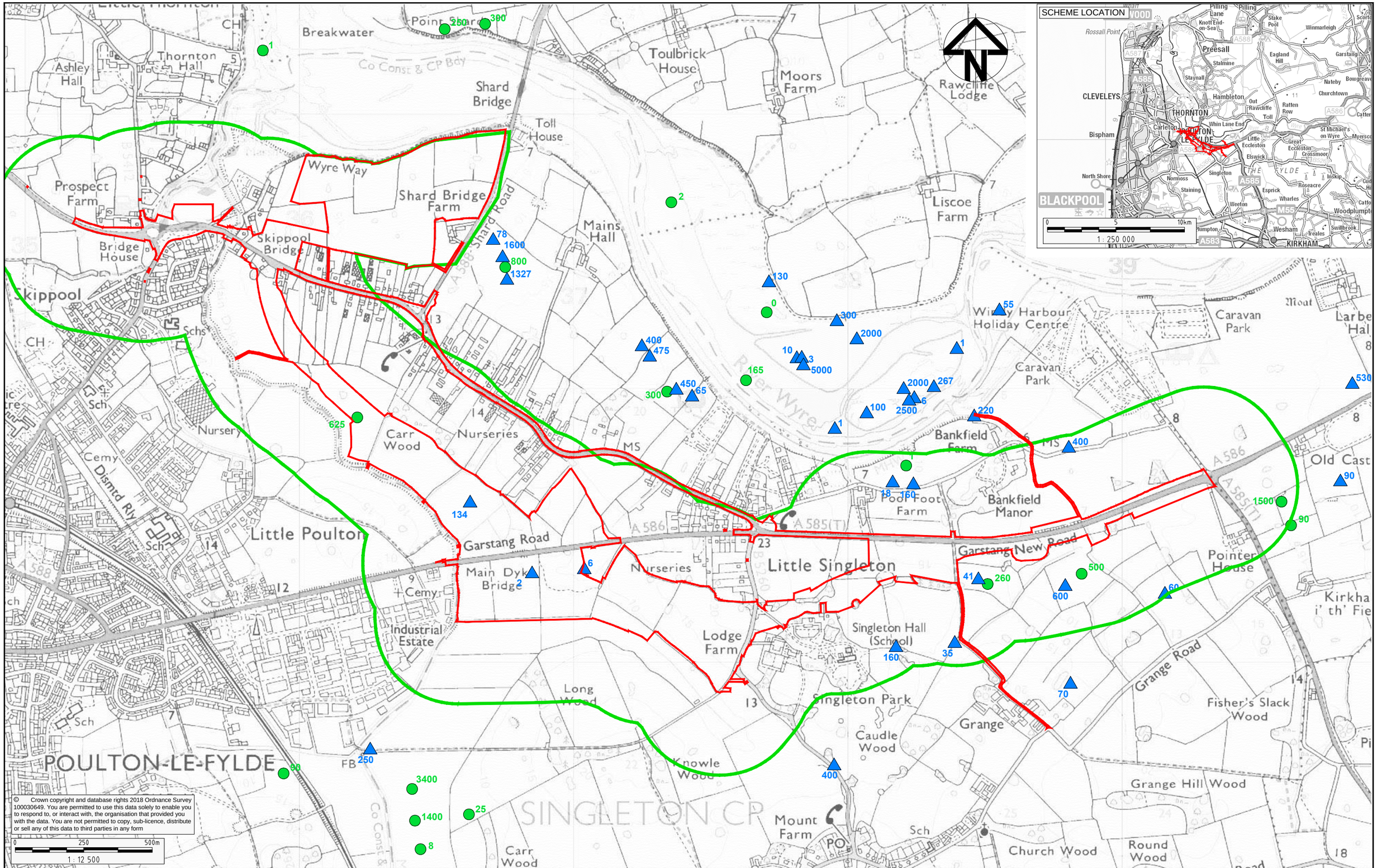
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 2

Drawing number: HE548643-A585-EAC-SZ_GN000-DR-L-3084

(HE PIN | Originator | Volume | Location | Type | Role | Number)



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0 250 500m
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KEY:

- Draft Order Limits
- 300m Construction Buffer
- 1 2016-2017 Location and Number of Birds
- 1 2017-2018 Location and Number of Birds

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

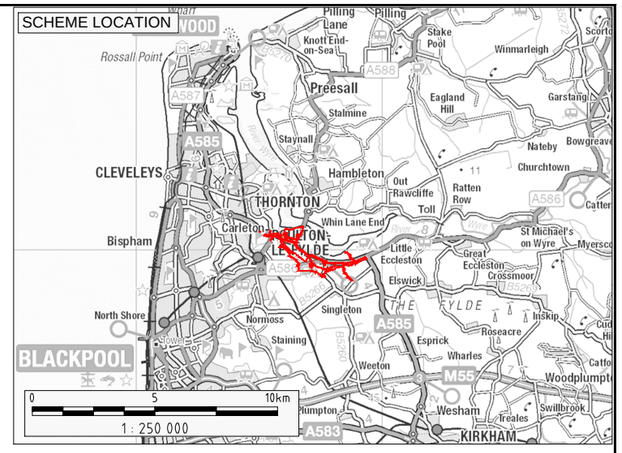
Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

PINK-FOOTED GOOSE GROUND RECORDS SHEET 1 OF 2

Status	S8 - DCO SUBMISSION
Revision	0
Scale	1:12 500 @ A3
Date	OCT 2018
Drawn By	J.NORMAN
Checked By	K.BURROWS
Approved By	N.HENDERSON
PINS No.	TR010035
	FIGURE 3

Drawing number (HE PIN | Originator | Volume | Location | Type | Role | Number): HE548643-A585-EAC-SZ_GN000-DR-L-3085



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1 : 12 500

KEY:

- Draft Order Limits
- 300m Construction Buffer
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- 1 — 2017-2018 Location and Number of Birds Recorded 1% Threshold Records Only (ie>156)

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

PINK-FOOTED GOOSE GROUND RECORDS (1% SPA POPULATION RECORDS) SHEET 2 OF 2

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:12 500 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
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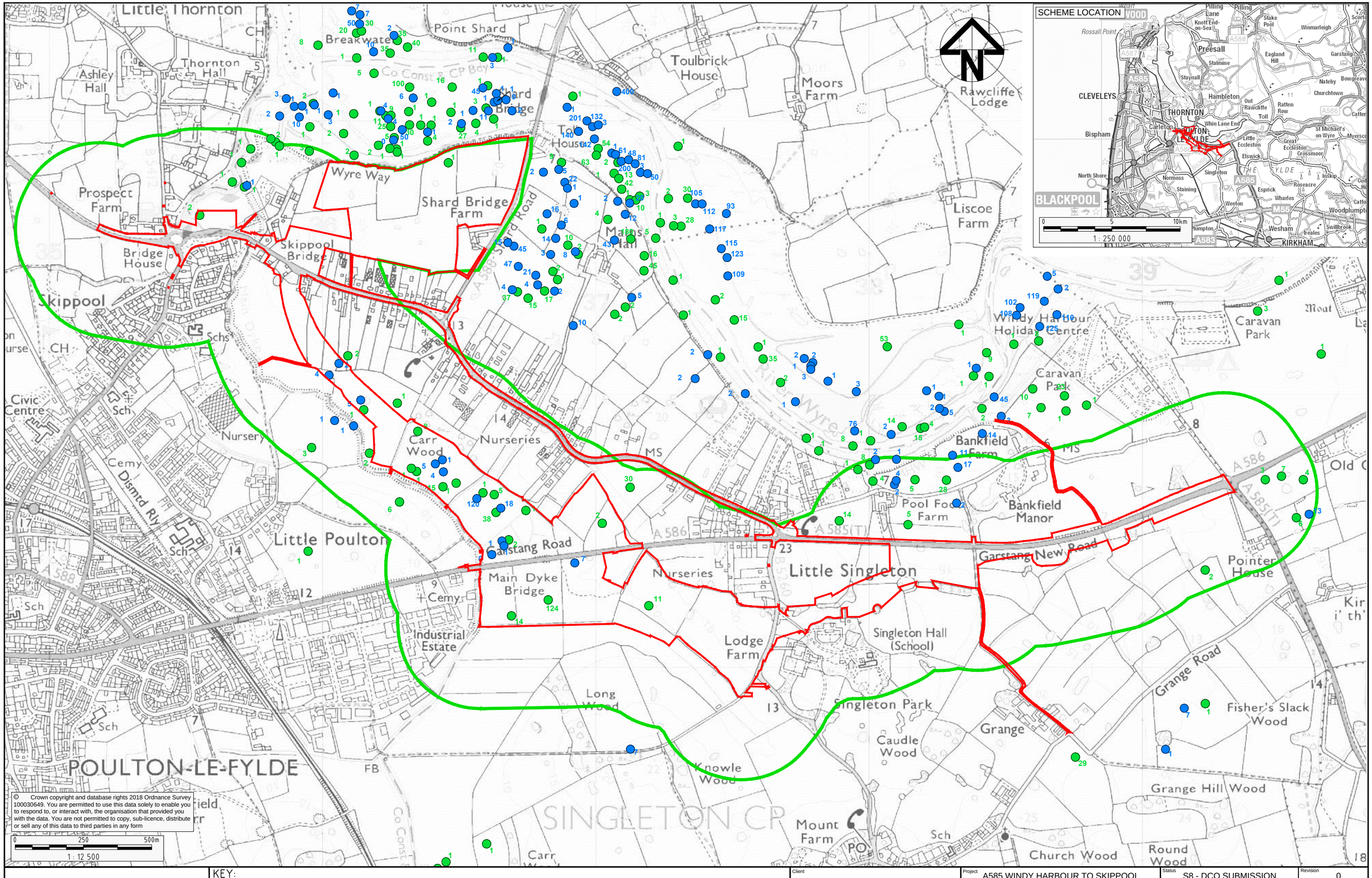
Drawing number: HE548643-A585-EAC-SZ_GN000-DR-L-3085



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KEY:

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- 300m Construction Buffer
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- 2017-2018 Location and Number of Birds Recorded

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

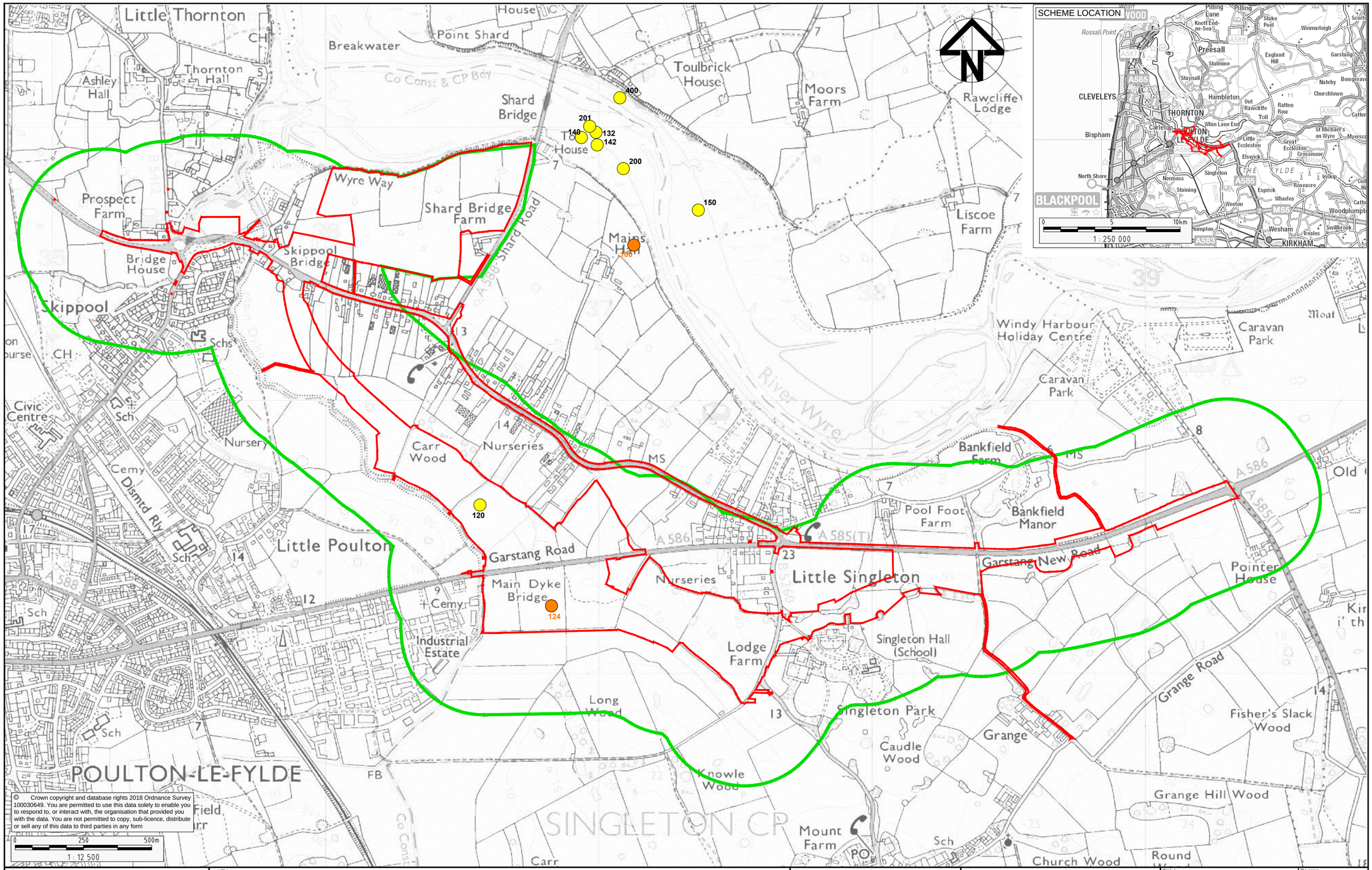
Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

CURLEW GROUND RECORDS SHEET 1 OF 2

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:12 500 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 4

Drawing number (HE PIN | Originator | Volume | Location | Type | Role | Number): HE548643-A585-EAC-SZ_ZZ000-DR-LE-3086



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0 250 500m
1 : 12 500

KEY:

- Draft Order Limits
- 300m Construction Buffer
- 2016-2017 Location and Number of Birds - 1% Threshold Records Only (i.e.>122)
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
1.0	S8	OCT18	FINAL	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITAT REGULATIONS ASSESSMENT

CURLEW GROUND RECORDS
(1% SPA POPULATION RECORDS)
SHEET 2 OF 2

Status	FINAL S8 - DCO SUBMISSION	Revision	1.0
Scale	1:12 500 @ A3	Date	22 OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
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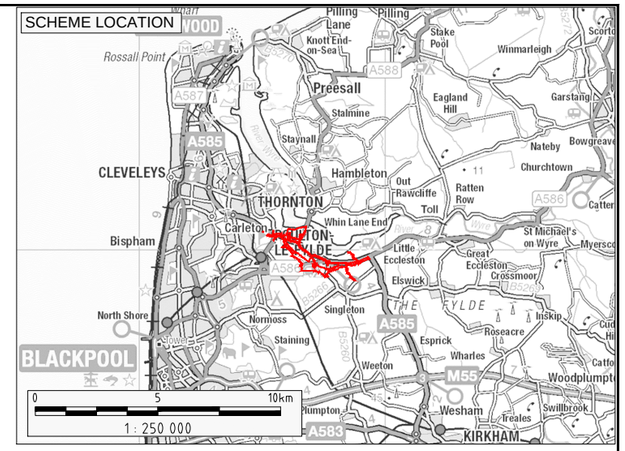

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0 300 600m
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KEY:

- Draft Order Limits
- 300m Construction Buffer
- 2016-2017 Location and Number of Birds Recorded
- 2017-2018 Location and Number of Birds Recorded

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

LAPWING GROUND RECORDS SHEET 1 OF 2

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:15 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 5

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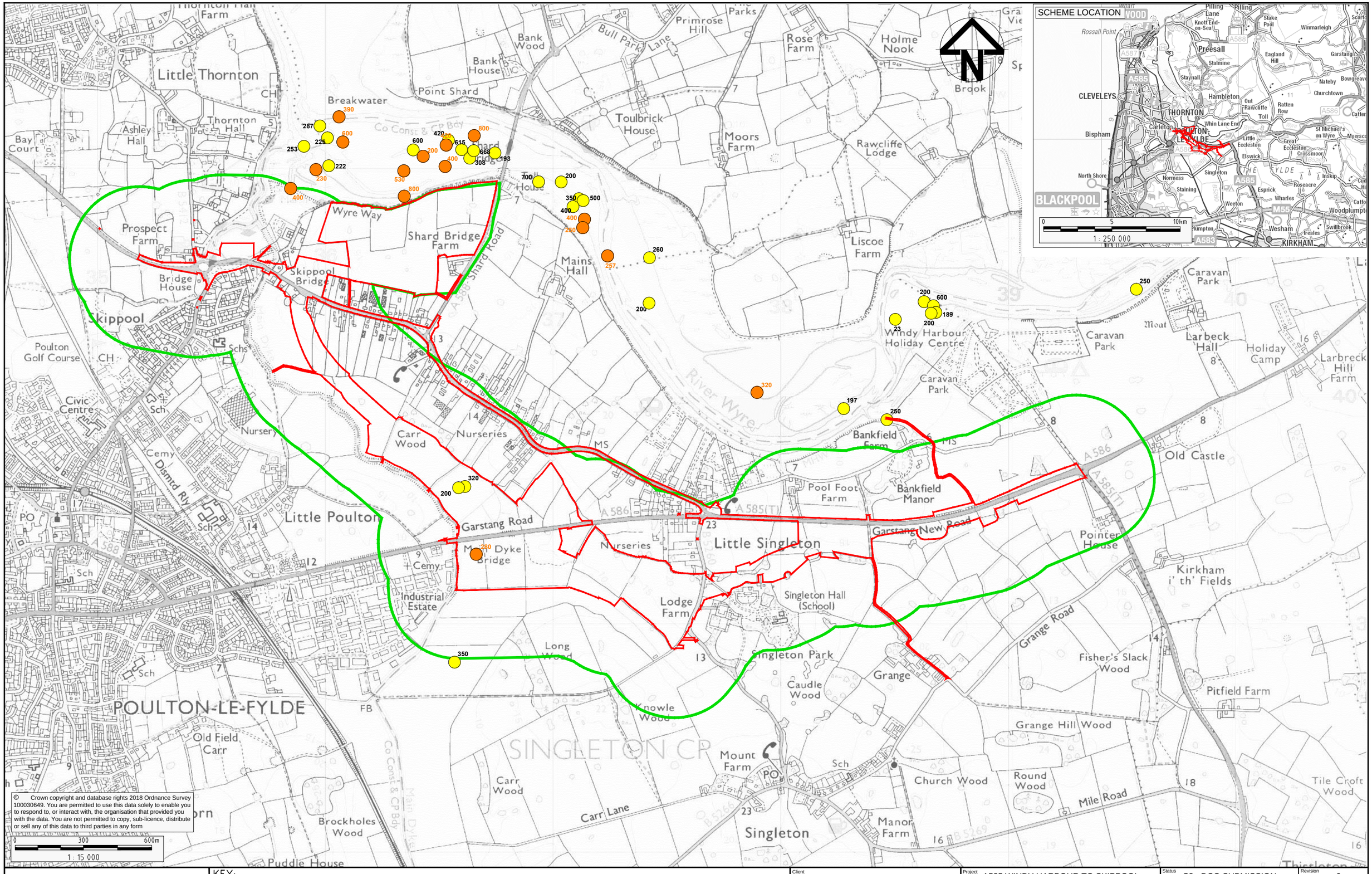

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KEY:

- Draft Order Limits
- 300m Construction Buffer
- 2016-2017 Location and Number of Birds - 1% Threshold Records Only (i.e.>165)
- 2017-2018 Location and Number of Birds - 1% Threshold Records Only (i.e.>165)

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

LAPWING GROUND RECORDS (1% RAMSAR SITE POPULATION RECORDS) SHEET 2 OF 2

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:15 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 5

Drawing number: HE PIN | Originator | Volume | Location | Type | Role | Number

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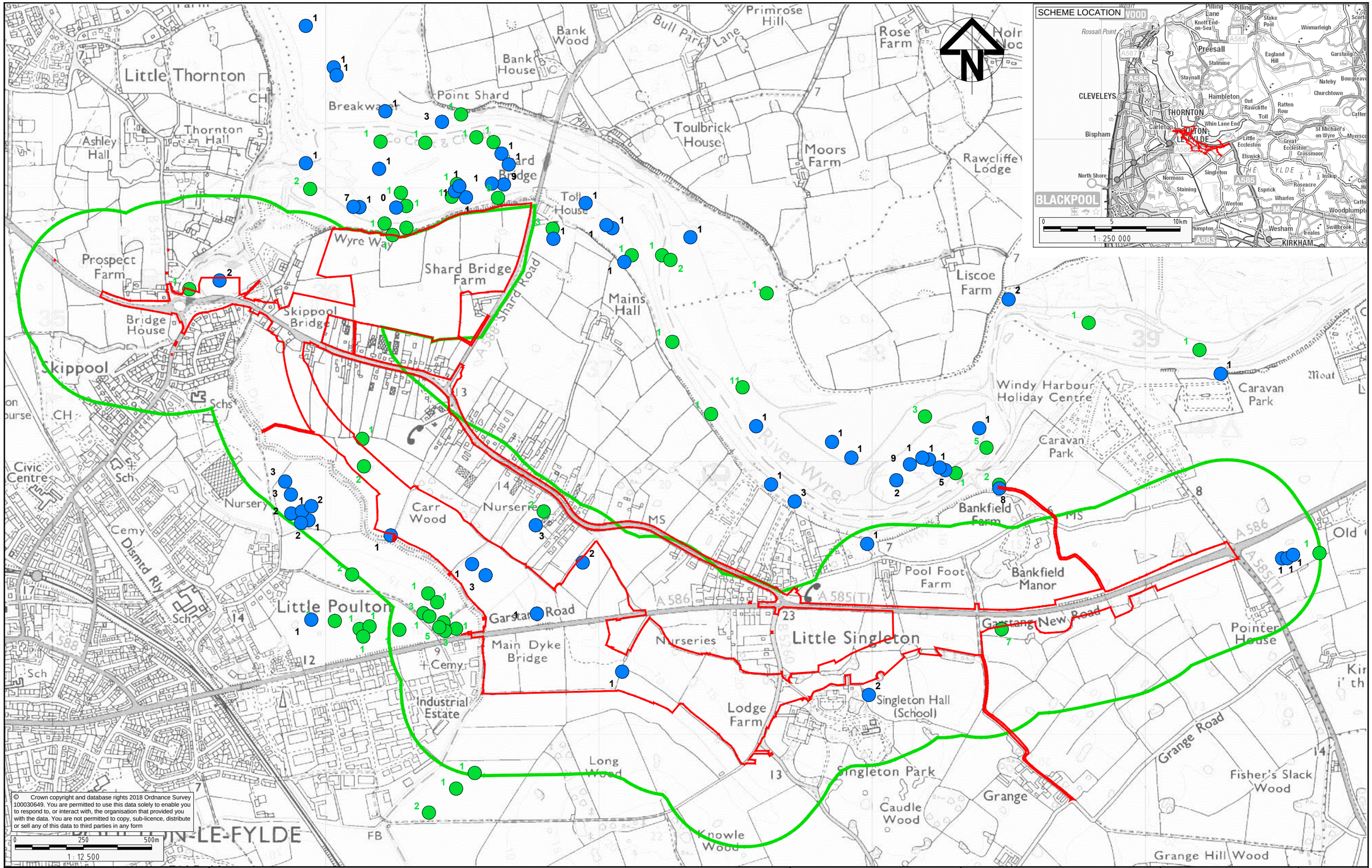

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KEY:

- Draft Order Limits
- 300m Construction Buffer
- 2016-2017 Location and Number of Birds Recorded
- 2017-2018 Location and Number of Birds Recorded

Client: highways england

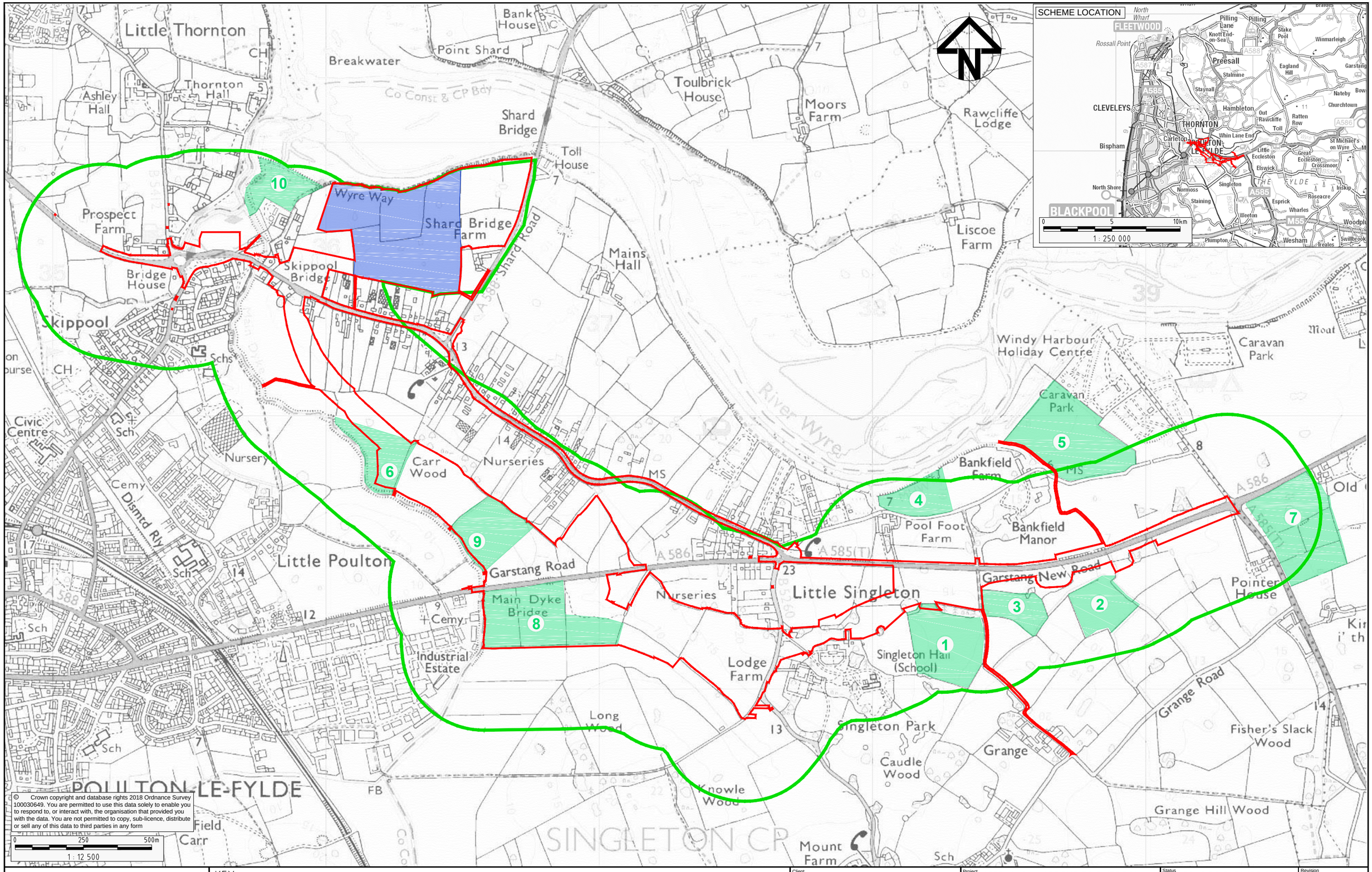
Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

LITTLE EGRET GROUND RECORDS

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:15 000 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 6

Drawing number: HE548643-A585-EAC-SZ_GN000-DR-L-3088



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0 250 500m
1 : 12 500

KEY:

- Draft Order Limits
- 300m Construction Buffer
- Mitigation Area
- Fields Supporting 1% or greater SPA/Ramsar species

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
0	S8	OCT18	S8 - DCO SUBMISSION	JN	KB	NH

Client: highways england

Project: A585 WINDY HARBOUR TO SKIPPOOL IMPROVEMENT SCHEME

Drawing Title: HABITATS REGULATIONS ASSESSMENT

FIELDS SUPPORTING 1% THRESHOLD SPA/ RAMSAR SITE SPECIES AND MITIGATION AREA

Status	S8 - DCO SUBMISSION	Revision	0
Scale	1:12 500 @ A3	Date	OCT 2018
Drawn By	J.NORMAN		
Checked By	K.BURROWS		
Approved By	N.HENDERSON		
PINS No.	TR010035		FIGURE 7

Drawing number (HE PIN | Originator | Volume | Location | Type | Role | Number): HE548643-A585-EAC-SZ_GN000-DR-L-3089

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APPENDIX 2 - Morecambe Bay and Duddon Estuary Conservation Objectives

European Site Conservation Objectives for Morecambe Bay & Duddon Estuary Special Protection Area Site Code: UK9020326

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

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

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

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

Qualifying Features

A026 *Egretta garzetta*; Little egret (Non-breeding)
A038 *Cygnus cygnus*; Whooper swan (Non-breeding)
A040 *Anser brachyrhynchus*; Pink-footed goose (Non-breeding)
A048 *Tadorna tadorna*; Common shelduck (Non-breeding)
A054 *Anas acuta*; Northern pintail (Non-breeding)
A130 *Haematopus ostralegus*; Eurasian oystercatcher (Non-breeding)
A137 *Charadrius hiaticula*; Ringed plover (Non-breeding)
A140 *Pluvialis apricaria*; European golden plover (Non-breeding)
A141 *Pluvialis squatarola*; Grey plover (Non-breeding)
A143 *Calidris canutus*; Red knot (Non-breeding)
A144 *Calidris alba*; Sanderling (Non-breeding)
A149 *Calidris alpina alpina*; Dunlin (Non-breeding)

Contd/

A151 *Philomachus pugnax*; Ruff (Non-breeding)
A156 *Limosa limosa islandica*; Black-tailed godwit (Non-breeding)
A157 *Limosa lapponica*; Bar-tailed godwit (Non-breeding)
A160 *Numenius arquata*; Eurasian curlew (Non-breeding)
A162 *Tringa totanus*; Common redshank (Non-breeding)
A169 *Arenaria interpres*; Ruddy turnstone (Non-breeding)
A176 *Larus melanocephalus*; Mediterranean gull (Non-breeding)
A183 *Larus fuscus*; Lesser black-backed gull (Non-breeding)
A183 *Larus fuscus*; Lesser black-backed gull (Breeding)
A184 *Larus argentatus*; Herring gull (Breeding)
A191 *Sterna sandvicensis*; Sandwich tern (Breeding)
A193 *Sterna hirundo*; Common tern (Breeding)
A195 *Sterna albifrons*; Little tern (Breeding)
Waterbird assemblage
Seabird assemblage

This is a European Marine Site

This SPA is a part of the Morecambe Bay European Marine Site ('EMS'). These Conservation Objectives should be used in conjunction with the current Conservation Advice document for the EMS. For further details about this please visit the Natural England website at https://www.gov.uk/government/collections/conservation-advice-packages-for-marine-protected-areas or contact Natural England's enquiry service at enquiries@naturalengland.org.uk or by phone on 0845 600 3078.

This is a new combined site

This SPA replaces two individual sites – Morecambe Bay SPA (UK9005081) and Duddon Estuary SPA (UK9005031).

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a Special Protection Area (SPA). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 13 September 2017 (version 5). This document updates and replaces an earlier version dated 29 January 2016 following the classification of the SPA. It replaces similar documents previously published for Morecambe Bay SPA (UK9005081) and Duddon Estuary SPA (UK9005031)

APPENDIX 3 - Bird Survey Report

A585 Windy Harbour to Skippool Improvement Scheme

TR010035

Bird Survey Report for SPA/Ramsar Site Species

October 2018

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1 INTRODUCTION

1.1.1 This Bird Survey Report presents the methodology and findings of the ornithological baseline study which are relevant to the Habitats Regulations Assessment that has been completed in support of Highways England's proposed development of the A585 between Windy Harbour to Skippool (hereafter referred to as 'the Scheme').

1.1.2 This study was undertaken by Arcadis (UK) Limited on behalf of Highways England. The full Bird Survey Report is provided as a Technical Appendix to the Environmental Statement (document reference TR010035/APP/6.8.4).

1.2 Aim and Objectives

1.2.1 The aim of this study was to obtain baseline desk study and field survey information with regard to the breeding, wintering and passage bird species and assemblages associated with the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site present within the Bird Survey Area (the Bird Survey Area is defined in Section 2.3). This included collecting information to determine the nature of activity for different bird species (i.e. foraging, commuting and/or roosting), and identify any wintering bird high-tide roosts within the Bird Survey Area.

1.3 Report Structure

1.3.1 This Bird Survey Report has been subdivided into the following sections:

- Section 1 and 2: provide the aims, objectives and methodologies adopted
- Chapter 3: presents the results of the desk study and field surveys
- Chapter 4: provides a summary of the results and overall conclusion
- Annexes A to C: provide detailed tables of the survey results

2 METHODOLOGY

2.1 Introduction

2.1.1 This Section of the Report details the desk study sources and the field survey methodology.

2.2 Desk Study

2.2.1 A comprehensive desk study was carried out in 2016 and is detailed in the Extended Phase 1 Habitat Report (document reference TR010035/APP/6.8.1). As part of the desk study, a search was carried out to identify breeding, wintering and passage birds of nature conservation importance within the footprint of the Scheme options and wider environment. In accordance with the Design Manual for Roads and Bridges (DMRB; Highways Agency, 2008), a study area of up to 1km was used to obtain records of birds of nature conservation importance. This study area was extended to 2km for Internationally designated sites with birds as a qualifying feature.

2.2.2 Table 2-1 summarises the various sources of information utilised for the desk study in relation to birds associated with the nearby Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site.

Table 2-1: Desk Study Data Sources

Source	Information Obtained	Distance from Scheme (i.e. study area) (km)
Multi-Agency Geographic Information Centre (MAGIC) (magic.defra.gov.uk)	The location of Internationally/Nationally designated sites (only including those for which birds are listed as a qualifying feature).	2
Lancashire Environment Record Network (LERN)	Records of protected and/or notable species dating back to 2005, and locations of non-statutory designated sites.	1
Fylde Bird Club	Bird records dating back to 2005.	0.5
British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) Core Count Data	Data from 2 Core Count Zones (Skippool (within the study area) and the entire Morecambe Bay SPA to allow comparisons of bird numbers recorded within the study area (from Fylde Bird Club and field surveys) to the most recent population estimates for the SPA.	N/A
Ordnance Survey (OS) mapping and online aerial imagery	An online search for areas supporting potentially important water features or habitats that could be considered suitable as functionally-linked land, as	1

Source	Information Obtained	Distance from Scheme (i.e. study area) (km)
	well as habitat features suitable for breeding SPA qualifying bird species.	
Natural England	The swan and goose functional land Impact Risk Zone GIS layer covering the north west of England.	N/A

2.3 Field Surveys

2.3.1 The Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site provides important habitats for both wintering and passage bird species, as well as some breeding bird species. A suite of surveys was therefore undertaken between mid-September 2016 and April 2018 to encompass the winter, breeding and spring/autumn passage periods. These are described in further detail below.

Consultation

2.3.2 Consultations regarding the scope of the ornithological surveys have been undertaken as the surveys have progressed since 2016. The scope of the surveys, as well as the survey methodologies used have been agreed in consultation with Natural England.

Defining the Field Survey Area

2.3.3 The survey area was defined by the potential impact pathways on ornithological receptors, and by the distance over which impacts might be experienced by birds utilising habitats which could be functionally-linked to the nearby Morecambe Bay and Duddon Estuary SPA and the Morecambe Bay Ramsar site (i.e. as far as the likely extent of biophysical change associated with the Scheme).

2.3.4 At the time of planning the field surveys, a northern route option - in addition to the final southern preferred option and an on-line option - remained a possibility. The survey area (hereafter referred to as the 'Bird Survey Area') therefore represents the then 3 route corridors plus an approximate 500m buffer. Following discussions on the possible need to provide mitigation under a worst-case scenario, the overall survey area was extended to the south west in 2016-17, to include an area of land identified from aerial images that may represent potential mitigation land. It was determined after the first year of survey that this area would not be used for mitigation and therefore surveys were not extended beyond the 500m buffer in 2017-18. The Bird Survey Area therefore covered an area equivalent to 500m (or more) from the edge of the each of the route alignments, and as such, a larger area was surveyed than if only one route alignment was being considered.

2.3.5 Due to the large extent of the Bird Survey Area the land was split into 6 distinct areas. Only areas where suitable habitat was present were surveyed (for example, woodlands were excluded). Suitable habitat was identified through a review of OS mapping and online aerial imagery. The 6 survey areas are shown on Figure 1, in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

In addition, to provide additional spatial information, each of the areas was divided into smaller land parcels. The land parcels within each survey area are detailed in Table 2-2 and are also shown on Figure 1, Appendix 1 of the HRA (document reference TR010035/APP/5.4).

Table 2-2: Land Parcels

Area Number	Land Parcel Number
1	1, 2, 3, 4, 5, 6
2	7, 8, 9, 10, 11
3	12, 13, 14, 15, 16
4	17, 18, 19, 20, 21
5	22, 23, 24, 25
6	26, 27, 28, 29

2.3.6 Details of the methodologies for each of the bird surveys are presented in the following sections.

Wintering and Passage Bird Surveys

2.3.7 Field surveys were undertaken between mid-September 2016 and end-April 2017 and mid-September 2017 to end-April 2018 to encompass the winter and spring/autumn passage periods. The timing of the autumn and spring passage periods can vary annually depending upon weather conditions. For the purposes of this Report, the autumn passage was considered to be the period September to mid-November, with spring passage occurring March to end-April. Therefore, an overlap between the passage and winter periods occurs during October and November and again in March, so birds recorded during these months could relate to either period. Where larger numbers of birds were recorded during October/early November and/or during March, with lower numbers during the main winter months it was assumed that these birds were moving through the area on passage.

2.3.8 Given the relatively flat nature of the Bird Survey Area, it was not possible to locate vantage points (VPs) with a sufficient viewshed without hinderance from hedgerows and trees to enable an effective survey. It was originally planned that surveys would incorporate a combination of walked transect routes with shortened VP counts along the routes; however, it became clear when commencing the surveys that VP counts were ineffective due to poor sightlines. Therefore, the survey effort focused on transect surveys, enabling full coverage of all suitable habitats within the Bird Survey Area. This approach was agreed in consultation with Natural England (meeting on 15 August 2017).

<u>Transect Surveys</u>

2.3.9 The transect surveys were carried out to identify the presence and distribution of foraging or roosting birds within the Bird Survey Area, particularly focusing on wintering wildfowl and waders. In order to do this, transect surveys were undertaken throughout the wintering and spring/autumn passage periods. The survey timings are set out in Table 2-3, below.

2.3.10 During each survey visit, the location of all waterfowl and wader species, as well as all other species of nature conservation concern (e.g. species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), species on

the RSPB red or amber lists (Eaton *et al*., 2015) and species listed in Section 42 of the Natural Environment and Rural Communities Act, 2006), were mapped and details of the species, number of birds and behaviour (i.e. foraging, roosting, loafing etc.) were recorded against Target Notes (TNs). The land parcel in which the birds were recorded was also noted. Although it was not considered necessary to detail the height of birds flying over during surveys, flight lines of significant flocks were mapped to inform the assessment of any regularly used commuting routes or patterns of activity.

Dusk and Dawn Surveys

2.3.11 Dusk and dawn surveys, as agreed during consultation with Natural England in December 2015, were conducted during the winter period (October 2016–March 2017 and October 2017–March 2018) in order to determine the importance of fields and saltmarsh within the Bird Survey Area as night roost and foraging sites for waterfowl and waders. The survey timings are set out in Table 2-3, below.

2.3.12 During each visit the location of all waterfowl and wader species were mapped and details of the species, number of birds and behaviour (i.e. foraging, roosting, loafing etc.) were recorded against TNs. The land parcel in which the birds were recorded was also noted.

Breeding Bird Surveys

2.3.13 Transect surveys were undertaken between April and June 2017 to encompass the breeding period.

Transect Surveys

2.3.14 The transect surveys were carried out to identify the presence and distribution of breeding birds (i.e. nesting and foraging) within the Bird Survey Area. Survey timings are set out in Table 2-3, below.

2.3.15 The breeding bird survey methodology comprised a variation of the Breeding Bird Survey (BBS) methodology from the British Trust of Ornithology (BTO) involving three visits, in April, May and June (Gilbert, et al., 1998).

2.3.16 During each survey, a predetermined transect route was walked, which enabled surveyors to approach all suitable habitats within the 6 survey areas to within 50m. Bird species of local and/or national nature conservation importance were mapped and recorded using standard BTO species and behaviour codes (Gilbert, et al., 1998), to indicate whether the individual was likely to be breeding within the survey area. Clear evidence of breeding was defined by types of activity or signs, such as males singing and repeated alarm calls. The land parcel in which the birds were recorded was also noted. Species of nature conservation importance recorded included:

- Species that receive protection under Schedule 1 of the Wildlife and Countryside Act (1981, as amended)
- Species of Principal Importance listed under Section 41 of the NERC Act (2006)
- Birds that are on the Red or Amber lists of Birds of Conservation Concern (BoCC) in the UK (Eaton, *et. al.,* 2015)

2.3.17 An inventory of all other species recorded was also produced for each survey visit.

2.4 Bird Survey Timings

2.4.1 The field surveys were undertaken as detailed in Table 2-3. Further details regarding the timing and frequency of transect surveys, as well as the associated weather conditions, are presented in Annex A.

Table 2-3: Survey Timings

Survey	Survey Effort
Transect surveys (Autumn passage)	Weekly daytime visits between mid-September to November during the autumn passage period in 2016 and 2017.
Transects and dawn and dusk surveys (Winter)	Two daytime surveys and 1 dawn or dusk survey per month October 2016–March 2017 and October 2017–March 2018 throughout the period that overwintering geese are active.
Transects (Spring)	Weekly daytime visits between March to mid-May in both 2017 and 2018 during the spring passage period.
Transects (Breeding)	One breeding bird survey visit per month April–June 2017.

2.4.2 Surveys were timed to take place across a variety of weather conditions and tidal states to obtain a representative picture of bird numbers and activity. The dusk surveys were timed to be completed 1 hour after sunset and the dawn surveys commenced 1 hour before sunrise.

3 RESULTS

3.1 Introduction

3.1.1 The results of the desk study and field surveys are described below and should be read in conjunction with Annexes A to C. [Note: due to the large number of records, results tables for wintering birds have only been included for species where 1% or greater of the SPA/Ramsar population were recorded, other results have been described in the text and data can be provided upon request].

3.2 Designated Sites

3.2.1 Two internationally designated sites (for which birds are the primary reason for the designation, or form part of the overall citation for the site) were identified within the Desk Study Area (refer to Section 2.2).

3.2.2 In addition, a further nationally designated site and 4 non-statutory designated sites (for which birds are listed as a feature of the site) were also identified within the Desk Study Area. However, these are discussed in more detail within the Chapter 8: Biodiversity of the Environmental Statement (document reference TR010035/APP/6.8).

3.2.3 The qualifying features associated with the 2 internationally designated sites are provided in Tables 3-1 and 3-2. The location of these 2 internationally designated sites are also shown on Figure 2, in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

Table 3-1: Qualifying Features of the Morecambe Bay and Duddon Estuary SPA

Species	Count, number of individuals (2010/11-2014/15)
During the breeding season	
Little term *Sterna albifrons*	84
Sandwich tern *Sterna sandvicensis*	1,608
Common tern *Sterna hirundo*	570
Lesser black-backed gull *Larus fuscus graellsii*	9,720
Herring gull *Larus Argentatus argentatus*	20,000
Internationally important seabird population of over 20,000 individuals	40,672
During the non-breeding season	
Whooper swan *Cygnus cygnus*	113
Pink-footed goose *Anser brachyrhynchus*	15,648
Shelduck *Tadorna tadorna*	5,878
Pintail *Anas acuta*	2,498
Little egret *Egretta garzetta*	134

Species	Count, number of individuals (2010/11-2014/15)
Oystercatcher *Haematopus ostralegus*	55,888
Golden plover *Pluvialis apricaria*	1,900
Grey plover *Pluvialis squatarola*	2,000
Ringed plover *Charadrius hiaticula*	1,049
Curlew *Numenius arquata*	12,209
Black-tailed godwit *Limosa limosa*	2,413
Bar-tailed godwit *Limosa lapponica*	3,046
Turnstone *Arenaria interpres*	1,359
Knot *Calidris canutus*	32,739
Ruff *Calidris pugnax*	8
Sanderling *Calidris alba*	3,600
Dunlin *Calidris alpina alpina*	26,982
Redshank *Tringa totanus*	11,133
Mediterranean gull *Larus melancephalus*	18
Lesser black-backed gull *Larus fuscus*	9,450
Internationally important waterbird assemblage of over 20,000 individuals	266,751

Table 3-2: Qualifying Features of the Morecambe Bay Ramsar site

Species	Count
Ramsar criterion 4: The site is a staging area for migratory waterfowl including internationally importan numbers of passage ringed plover *Charadrius hiaticula*	
Ramsar criterion 4: Assemblages of international importance: Species with peak counts in winter: 223,709 waterfowl (5 year peak mean 1998/99-2002/2003)	
Ramsar criterion 6 – species/populations Occurring at levels of international importance. Qualifying Species/populations (as identified at designation): **Species regularly supported during the breeding season:**	
Sandwich tern	290 pairs, representing an average of 2.8% of the GB population (5 year mean for 1992 to 1996)
Lesser black-	19,666 apparently occupied nests, representing an average of

Species	Count
backed gull	13.3% of the breeding population (Seabird 2000 Census)
Herring gull	10,431 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census)
Species with a peak count in Spring/Autumn	
Great Cormora	967 individuals, representing an average of 4.2% of the GB population (5 year peak mean 1998/9- 2002/3)
Shelduck	7,032 individuals, representing an average of 2.3% of the population (5 year peak mean 1998/9-2002/3)
Pintail	3,743 individuals, representing an average of 6.2% of the population (5 year peak mean 1998/9-2002/3)
Eider	5,657 individuals, representing an average of 7.7% of the GB population (5 year peak mean 1998/9-2002/3)
Oystercatcher	66,577 individuals, representing an average of 6.5% of the population (5 year peak mean 1998/9-2002/3)
Ringed plover	1,041 individuals, representing an average of 1.4% of the population (5 year peak mean 1998/9-2002/3)
Grey plover	1,655 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9-2002/3)
Sanderling	703 individuals, representing an average of 3.4% of the GB population (5 year peak mean 1998/9- 2002/3 - spring peak)
Curlew	20,018 individuals, representing an average of 4.7% of the population (5 year peak mean 1998/9-2002/3)
Redshank	8,816 individuals, representing an average of 3.5% of the population (5 year peak mean 1998/9-2002/3)
Turnstone	1,359 individuals 1371 individuals, representing an average of 1.4% of the population (5 year peak mean1998/9-2002/3)
Lesser black-backed gull	40,393 individuals, representing an average of 7.6% of the population (5 year peak mean 1998/9-2002/3)
Species with a peak count in winter	
Great crested grebe	217 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9- 2002/3)
Pink-footed goo	3,665 individuals, representing an average of 1.5% of the population (5 year peak mean 1998/9-2002/3)
Wigeon	6,133 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Goldeneye	285 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9- 2002/3)
Red-breasted	327 individuals, representing an average of 3.3% of the GB

Species	Count
merganser	population (5 year peak mean 1998/9- 2002/3)
Golden plover	4,073 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Lapwing	16,492 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9- 2002/3)
Knott	66,335 individuals, representing an average of 14.7% of the population (5 year peak mean 1998/9-2002/3)
Dunlin	26,416 individuals, representing an average of 1.9% of the population (5 year peak mean 1998/9-2002/3)
Bar-tailed godw	4,579 individuals, representing an average of 3.8% of the population (5 year peak mean 1998/9-2002/3)

3.3 Passage and Wintering Bird Survey 2016–2018

3.3.1 The results of the 2016 to 2018 Spring/Autumn passage and wintering bird surveys are described in the following sections. Detailed results tables are provided in Annex B.

Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site Qualifying Species

3.3.1 Sixteen Morecambe Bay and Duddon Estuary SPA and Ramsar site qualifying species (designated for peak counts during the winter, on passage or both) were recorded during the passage and winter bird transect surveys in 2016/17, and 15 qualifying species were recorded in 2017/18. These species comprised: pink-footed goose, shelduck, curlew, black-tailed godwit, knot, dunlin, oystercatcher, redshank, ringed plover (2016/17 only), golden plover, little egret, lapwing, wigeon, red-breasted merganser, cormorant and lesser black-backed gull.

3.3.1 Table 3-3: Peak Count of Foraging/roosting Waterfowl During Autumn Passage and Wintering Bird Surveys (September 2016 to April 2017 and September 2017 to April 2018)Table 3-3 provides details of the peak counts for the 16 SPA/Ramsar site species recorded during the winter and passage bird surveys (combining the transect and dawn and dusk survey results). Table 3-3 shows the peak count of birds recorded on the ground on each survey date (i.e. birds utilising the habitats within the Bird Survey Area that could be affected by the Scheme). Where a higher peak count was recorded in flight rather than on the ground, this has also been included in brackets for information to show that birds were present in the area but were not recorded on the ground within the Bird Survey Area. The table is also split by the 6 Bird Survey Areas (described in paragraph 2.3.5, and shown on Figure 1, in Appendix 1 of the HRA (document reference TR010035/APP/5.4) to show where the birds have been recorded to provide spatial context to the data.

Table 3-3: Peak Count of Foraging/roosting Waterfowl During Autumn Passage and Wintering Bird Surveys (September 2016 to April 2017 and September 2017 to April 2018)[1]

Species	Qualifying feature	Area	Peak Count on Ground (Peak count in flight is included in brackets where greater than on ground only)															
			September		October		November		December		January		February		March		April	
			2016	2017	2016	2017	2016	2017	2016	2017	2017	2018	2017	2018	2017	2018	2017	2018
Pink-footed goose	Winter/ passage	1			(28)		8 (190)		3,400		90 (140)				1 (43)	6		
		2		70	(300)	41	(111)		1,500	60	500 (4,000+)	160		600				(44)
		3	1		(180)	530	(28)		165 (205)		300	400				18		475
		4			(150)		(55)				800	2,500						
		5					(95)		(190)		(425)	134					(1)	
		6				267	0	100	165		300 (330)		(35)	55		7,500		
Lapwing	Ramsar site qualifying feature only (winter)	1			100 (500)		90		1		40		52	350	54		280	2
		2					1 (9)	4	9			50					35	1
		3	100 (400)		257	146	48		150	20	45 (800)	250	320					
		4	800	26	126		530	11	7	3	450	82	200		1		2	1
		5	35	45	24	320	10	7	2 (4)	200	55	5		3			(1)	
		6	16 (400)	420	240	253	120	615	800	668	600	700	35	200		40	20	
Curlew	Winter/ passage	1			11		124		46	7								
		2	1		6 (12)		29						(1)		7	7	(13)	
		3	14	17	45	14	8		180+	3	5		53		1	45	15 (33)	10
		4	15 (78)	10	5 (9)		37		1		1 (3)		30 (105)	45	10	47	17	14
		5	15		8	2	38	5	1	120		1				4		18
		6	35	45	30	132	40	6		201	40	400	100+	150	63	50	64	20
Little egret	Winter	1					(1)								1	1	2	
		2							7				(1)	1	1	1	(1)	
		3	5		1		2		(1)			8	(1)		1	1	1	
		4	9	7			1			1	1		1		3		2	
		5				3		3	2	3	1	1	(1)		5	1	3	
		6	11	9	3	9	2	1		5	1				1	1	1	3
Shelduck	Winter/ passage	1													9	2	2	2
		2													1 (2)		4	5
		3	1		6				(2)	5		5	10		4	4	3	7
		4											1		2 (8)	3	2	4
		5								4		2	2		4 (7)	2	2	7
		6			4	2	11	42		15		70	2	79	7	11	15	6
Oystercatcher	Winter passage	1													2	2	3	2
		2													3	2	2	2
		3									1				7	2	5	4

[1] peak counts that are in brackets indicate birds in flight where this was greater than the number recorded on the ground

Species	Qualifying feature	Area	Peak Count on Ground (Peak count in flight is included in brackets where greater than on ground only)															
			September		October		November		December		January		February		March		April	
			2016	2017	2016	2017	2016	2017	2016	2017	2017	2018	2017	2018	2017	2018	2017	2018
		4			35										2	2	3	4
		5						1							2	2		2
		6			(5)		11			5			21	1	2	8	2	7
Redshank	Winter/ passage	1					(1)	1	71						51	5	(2)	1
		2																
		3	2 (4)		20	2	12		2	45	4	34	4		22	8	7 (50)	7
		4	30	1	55	50	33	2	21		52		1		12	8	10	2
		5												1		7		
		6	32	42	5	72	11	24	3	120	2	25		30	8	24	28	43
Lesser black-backed gull	Winter/ passage	1	5		6	3	1		2			1			5		1	25
		2					(2)						(2)		2 (6)	2	(120)	7
		3	3		5				2		1		(1)		4 (9)	4	(1)	
		4	22	1		7	1	1			3	1	5		40	16	36	10
		5	3				3						1		1 (3)		2	12
		6	130	85	10	20	1	8		5	20	0	2	3	5 (23)	30	15	20
Dunlin	Winter/ passage	1																
		2																
		3																1
		4	27		15		34		33									
		5																
		6		9	15			6		50		30		250	1	400		
Black-tailed godwit	Winter/ passage	1							6									
		2																
		3																1
		4														1		
		5												5	(39)			
		6																73
Knot	Winter/ passage	1																
		2																
		3																
		4	1															
		5																
		6	170															
Cormorant	Ramsar site qualifying feature only (passage)	1							(1)		1							
		2							(1)		(1)		1	2	3	1		
		3	3		3	3		3	1	13			6	12	1	6	3	
		4	8		1						(1)	1			2	1	1	
		5			(1)						1		2		4		3	
		6	3		2		5		2	1	1	1		7	1	1	2	
Red-breasted merganser	Winter/ passage	1																
		2																
		3			2													
		4												1				
		5																

Species	Qualifying feature	Area	Peak Count on Ground (Peak count in flight is included in brackets where greater than on ground only)															
			September		October		November		December		January		February		March		April	
			2016	2017	2016	2017	2016	2017	2016	2017	2017	2018	2017	2018	2017	2018	2017	2018
		6																
Wigeon	Winter/ passage	1							60									
		2																
		3			35					60	(36)	5						
		4															2	
		5			(11)	6		6										
		6		28		76	20	109	20	63		67		20		140		
Golden plover	Winter/ passage	1					(11)							70				
		2																
		3																
		4	200			140					(25)							
		5										3						
		6		170	32	397				250		250		100				
Ringed plover	Winter/ passage	1																
		2																
		3					1											
		4																
		5																
		6					1											

3.3.2 The sections below provide further details of the distribution of the qualifying features of Morecambe Bay and Duddon Estuary SPA/ Morecambe Bay Ramsar site recorded during the winter/passage surveys. The land parcels described in Section 2.3 have been used to provide additional spatial information, where necessary.

3.3.3 It is normally considered by Statutory Nature Conservation Bodies (SNCBs) that if an area of land regularly and frequently supports 1% or greater of the total of the SPA/Ramsar site qualifying species population, then this is considered to be significant (Young and Shackleton, 2007). Records of qualifying species where 1% or greater of the SPA population has been recorded during the surveys are detailed in the individual species accounts with full details of all of the records from the bird surveys provided in Annex B. Table 3-4 shows the 1% thresholds that have been taken from the 5-year peak means 2009/10–2013/14 for the Morecambe Bay and Duddon Estuary SPA citation, which is the most recent data for the region, and is considered the most appropriate numbers to use. The Ramsar site population figures have also been included in Table 3-4 where the species is a qualifying species of the Ramsar site only.

Table 3-4: Qualifying Species Population and 1% Threshold

Species	Morecambe Bay and Duddon Estuary SPA population (2009/10–2013/14)	Ramsar site population (1998/9-2002/3)	1% threshold of the SPA / Ramsar site population
Pink-footed goose	15,648	3,665	156
Lapwing	N/A	16,492	165
Curlew	12,209	20,018 (passage)	122
Little egret	134	N/A	1
Shelduck	5,878	7,032 (passage)	59
Oystercatcher	55,888	66,577 (passage)	558
Redshank	11,133	N/A	111
Lesser black-backed gull	9,450	4,093 (passage)	94
Dunlin	26,982	26,416	269
Black-tailed godwit	2,413	N/A	24
Knot	32,739	66,335	327

Species	Morecambe Bay and Duddon Estuary SPA population (2009/10–2013/14)	Ramsar site population (1998/9-2002/3)	1% threshold of the SPA / Ramsar site population
Cormorant	N/A	967 (spring/autumn)	9
Red-breasted merganser	N/A	327	3
Wigeon	N/A	6,133	61
Ringed plover	1,049	1,041 (passage)	10
Golden plover	1,900	4,073 (wintering)	19

Pink-footed Goose (Autumn and Winter)

Desk Study

3.3.4 Information provided by LERN identified an area of approximately 145,000km^2 to the north of the River Wyre (of which a small proportion lies within 1km of the Scheme) is regularly used by pink-footed geese. At its closest point this area is 370m north of the Scheme. Records of pink-footed geese within the Desk Study Area were also provided by LERN; of these, 10 records were of flocks above the 1% population threshold. Fylde Bird Club also provided 14 records of pink-footed geese above the 1% population threshold, 5 of which were within Area 1, 2 records correlated to Area 5 and 1 record in Area 2. The remaining 6 records were associated with the Estuary and adjacent habitats in Areas 4 and 6.

3.3.5 A review of Natural England's swan and goose functional land Impact Risk Zone (IRZ) GIS layer showed that a proportion of the Scheme lies within the IRZ. The farmland within and adjacent to the southern end of the Scheme is within the IRZ, and therefore has the potential to be functionally-linked to the Morecambe Bay and Duddon Estuary SPA/ Morecambe Bay Ramsar site. The northern end of the Scheme, which is not within the IRZ, is closer to existing centres of development and is considered unlikely to represent functionally-linked land.

Field Surveys

3.3.6 Pink-footed geese were recorded throughout the wintering/passage bird surveys. A total of 103 observations were recorded during the 2016–17 surveys and 147 observations during the 2017-18 surveys. The majority of these records related to flocks flying over the survey area. All of the pink-footed goose foraging/ roosting records are shown on Tables B-1 and B-2, in Annex B, and on Figure 3, Sheet 1, in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

3.3.7 Table 3-5 shows the instances where 1% or greater of the of the Morecambe Bay and Duddon Estuary SPA population were recorded within the Bird Survey Area. The table also shows the land parcel within which each of the flocks were

identified. These records are mapped on Figure 3 (sheet 2), in Appendix 1 of the HRA (document reference TR010035/APP/5.4). The remaining records were either below the 1% threshold or were only observed in flight (as described in the following paragraphs) [Note: birds in flight are not included in the tables or figures].

Table 3-5: Foraging/roosting Pink-footed Goose Records 1% or Greater of SPA Population

Survey date	Number of birds	Area	Land parcel
Records within 300 m of construction area			
13/12/2016	1,500	2	11
18/01/2017	500	2	10
	260	2	10
28/03/2017	625	5	22
08/01/2018	160	2	8
09/01/2018	160	3	13
22/01/2018	400	3	13
05/02/2018	600	2	10
Records within wider bird survey area			
02/12/2016	1,400	1	3
09/12/2016	3,400	1	3
15/12/2016	165	6	28
18/01/2017	300	3	15
20/01/2017	800	4	17
25/01/2017	300	6	27
25/01/2017	250	6	27
03/10/2017	267	6	28
25/10/2017	530	3	12
09/01/2018	2,500	4	17
	220	3	13
23/01/2018	250	1	2
	400	2	7
08/03/2018	7,500	6	28
13/03/2018	2,000	6	28
19/03/2018	300	6	28
19/03/2018	2,000	6	28
06/04/2018	475	3	15
10/04/2018	400	3	15

3.3.8 During the first season of passage and winter surveys (2016-17), the number of pink-footed geese recorded within the Bird Survey Area peaked during December 2016 and January 2017, with 68 of the 103 records (including birds in flight) occurring during these 2 months. All records that comprised 1% or greater of the SPA population foraging or roosting within the Bird Survey Area were also recorded during December and January, including 2 large flocks of 3,400 and

1,500 birds in December (refer to Table 3-5). During the September, October and November 2016 surveys, very low numbers (1, 0 and 8 respectively) were recorded on the ground with larger flocks only recorded in flight, commuting over the Bird Survey Area. Only 2 observations of pink-footed goose were made during the February survey, both of which related to birds in flight only with a flock of 41 birds and 35 birds recorded commuting through. There were 4 observations in March, 1 of which related to a flock of 625 birds foraging in Area 5 on 28 March 2017, the remaining 3 records were of either 1 or 2 birds foraging. There were 2 observations in April, with 5 birds recorded each time (refer to Table B-1 in Annex B).

3.3.9 During the second season of passage and winter surveys (2017-18), pink-footed geese were regularly recorded during October with 64 of the 147 observations (including birds in flight) occurring in this month. This included 2 records of foraging birds above the 1% threshold, comprising flocks of 267 birds and 530 birds (refer to Table 3-5). However, 58 of the October observations were recorded in flight only. The peak number of foraging birds within the farmland habitats occurred in January 2018 when 7 observations of flocks at or above the 1% threshold were recorded, with a peak count of 2,500 birds in Area 4 (refer to Table 3-5). The highest number of birds were recorded in March 2018 with a peak-count of 7,500 (comprising a flock of 5,000 and 2,500 which joined together) and 2 further records of 2,000 birds and 1 flock of 300 birds were identified. These birds were all on the Estuary in Area 6. Other large aggregations were recorded in February 2018, when a single record of 600 birds within Area 2 was observed and in April 2 records, both in Area 3, comprised 400 and 475 birds (refer to Table B-2 in Annex B).

Summary

3.3.10 The bird survey results show that pink-footed geese are present within the Bird Survey Area throughout the passage and wintering periods. Flocks comprising birds at or above the 1% SPA threshold were most frequently recorded in Areas 2 and 3, coinciding with the eastern part of the Scheme (adjacent to the existing A585 road).

3.3.11 The bird surveys in Areas 1 and 5 (which would be directly affected by the Scheme) did not identify any patterns of regular use by significant numbers of birds over the 2-year survey period. As such, whilst they do provide potentially suitable foraging habitat for pink-footed geese, the surveys have shown that the fields within these areas are only used on a sporadic and opportunistic basis. In addition, the large flocks which were recorded in Area 3 (2017-18) and Area 4 (2016-17), are not within the final footprint of the completed road and are beyond the distance over which disturbance effects would occur (300 m).

Curlew (Winter)

Desk Study

3.3.12 The desk study identified 21 records of curlew within the Desk Study Area. All of which were provided by Fylde Bird Club. LERN did not provide any records of curlew. Only 2 of the 21 records related to flocks at or above the 1% threshold.

These comprised flocks of 208 and 161 birds. Both records related to fields to the south of Garstang Road East within Survey Area 1.

Field Surveys

3.3.13 Curlew were frequently recorded throughout the wintering/passage bird surveys. A total of 155 observations were recorded during the 2016–17 surveys, and 127 observations during the 2017-18 surveys. All curlew foraging/roosting records are shown on Tables B-3 and B-4, in Annex B, and on Figure 4, Sheet 1 in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

3.3.14 Table 3-6 shows the instances where 1% or greater of the Morecambe Bay and Duddon Estuary SPA population were recorded foraging or roosting within the Bird Survey Area. The table also shows the land parcel within which each of the flocks were identified. These records are mapped on Figure 4 (sheet 2) in Appendix 1 of the HRA (document reference TR010035/APP/5.4) with their corresponding target note number. The remaining records were all below the 1% threshold or were only observed in flight (as described in the following paragraphs).

Table 3-6: Foraging/roosting Curlew Records 1% or Greater of SPA Population

Survey date	Number of birds	Area	Land parcel
Records within 300 m of construction area			
11/11/2016	124	1	5
19/12/2017	120	5	24
Records within wider bird survey area			
09/12/2016	180	3	16
04/10/2017	132	6	27
04/12/2017	142	6	27
05/12/2017	200	6	27
05/12/2017	201	6	27
23/01/2018	400	6	27
05/02/2018	150	6	28
19/02/2018	140	6	27

3.3.15 During the first season of passage and winter surveys (2016-17), the majority of the observations of curlew were associated with the River Wyre (Survey Area 6). The distribution of birds along the River Wyre was closely linked to the tidal state, with higher numbers of birds recorded at high tide. Only 2 of the records within the 2016-17 bird surveys related to flocks of 1% or greater of the Morecambe Bay and Duddon Estuary SPA population, comprising a flock of 124 birds in November within Survey Area 1, and a flock of 180 birds in December in Area 3. The remaining records were of sightings of flocks of less than 10 birds, with only a handful of sightings of over 50 birds (refer to Table B-3 in Annex B and Figure 4 (sheet 1) in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

3.3.16 Although overall fewer observations of curlew were recorded during the 2017-18 passage and wintering bird surveys, 8 of the records comprised flocks of above

the 1% threshold population. Only 1 of these large flocks related to birds utilising farmland habitats (comprising 120 birds within Area 5 in December). The remaining records were all associated with the River Wyre (refer to Table B-4 in Annex B and Figure 4 (sheet 2) in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

Summary

3.3.17 The bird survey results show that the majority of the curlew records across both survey seasons were associated with the River Wyre (Area 6) and immediately adjacent habitats. Only 2 flocks above the 1% SPA threshold were recorded utilising farmland habitat within Area 1 and Area 5. These survey results correlated with the Fylde Bird Club data which also showed regular use by low number of birds, with only occasional presence of large flocks within farmland habitats.

Lapwing (Winter)

Desk Study

3.3.18 The desk study identified 25 records of lapwing within the Desk Study Area. One record was provided by LERN which related to 900 lapwing to the south of Garstang New Road at the eastern end of the Scheme (Area 1). Twenty-four records were provided by the Fylde Bird Club, of which 7 comprised flocks of above the 1% threshold population. Of these 7 large flocks, 6 were also associated with the farmland south of Garstang New Road (Area 1), with 1 record of 900 lapwing located to the east of Shard Bridge, on the River Wyre (Area 6).

Field Surveys

3.3.19 Lapwing were recorded throughout the passage and winter surveys. A total of 142 sightings were recorded during the 2016–17 surveys, and 102 during the 2017-18 surveys. All lapwing foraging/roosting records are shown on Tables B-5 and B-6, in Annex B, and on Figure 5, Sheet 1, in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

3.3.20 Table 3-7 shows the instances where 1% or greater of the Ramsar site population were recorded within the Bird Survey Area. The table also shows the land parcel within which each of the flocks were identified. These records are mapped on Figure 5 (sheet 2), in Appendix 1 of the HRA (document reference TR010035/APP/5.4). The remaining records were all below the 1% threshold or were only observed in flight (as described in the following paragraphs).

Table 3-7: Foraging/roosting Lapwing Records 1% or greater of Ramsar Population

Survey date	Number of birds	Survey area	Land parcel
Records within 300 m of construction area			
23/09/2016	400	4	18
05/04/2017	280	1	5
03/10/2017	320	5	25

Survey date	Number of birds	Survey area	Land parcel
19/12/2017	200	5	25
Records within wider bird survey area			
23/09/2016	800	4	18
21/10/2016	257	6	28
21/10/2016	240	6	27
28/10/2016	250	6	28
16/11/2016	230	4	18
16/11/2016	530	6	27
02/12/2016	400	6	28
02/12/2016	800	6	27
02/12/2016	390	6	27
20/01/2017	600	6	27
25/01/2017	400	6	27
17/02/2017	200	6	27
17/02/2017	320	6	28
19/09/2017	248	6	28
26/09/2017	420	6	27
27/09/2017	260	6	28
27/09/2017	197	6	28
11/10/2017	253	6	26
25/10/2017	189	6	28
26/10/2017	222	4	18
26/10/2017	287	6	27
14/11/2017	615	6	27
16/11/2017	225	6	27
04/12/2017	200	6	28
05/12/2017	500	6	27
05/12/2017	668	6	27
18/12/2017	200	6	28
18/12/2017	200	6	27
18/12/2017	193	6	27
19/12/2017	350	6	27
19/12/2017	600	6	27
09/01/2018	250	6	29
09/01/2018	250	3	13
22/01/2018	700	6	27
23/01/2018	400	6	27
05/02/2018	350	1	5
05/02/2018	200	6	28
20/02/2018	308	6	27
20/02/2018	600	6	28

3.3.21 During the first season of passage and winter surveys (2016-2017), the majority of the records were associated with the River Wyre and adjacent habitats. Only 15 records related to flocks comprising 1% or greater of the Ramsar site

populations, of which all but 1 were recorded on or immediately adjacent to the River Wyre (Survey Area 6). A single record of 280 lapwing was associated with farmland in Survey Area 1, however, this flock was recorded during April 2017 and therefore is likely to relate to birds on passage rather than the wintering bird population for which the Ramsar site is designated. The majority of records were of flocks below 55 birds with the vast majority of records within the farmland areas being of fewer than 10 birds (refer to Table B-5 in Annex B).

3.3.22 A similar pattern of behaviour was recorded during the 2017–18 passage and winter surveys, with the majority of records associated with the River Wyre and adjacent habitats. Of the 102 observations, 28 related to flocks comprising 1% or greater of the threshold population, of which only 3 were associated with farmland close to the Scheme (with 2 records in Area 5 and 1 in Area 1) (refer to Table B-6 in Annex B).

Summary

3.3.23 Similarly to curlew, the majority of the lapwing records across both survey seasons were associated with the River Wyre and immediately adjacent habitats, with only 4 of the flocks above the 1% or greater threshold recorded using habitat other than the River Wyre.

Little Egret

Desk Study

3.3.24 LERN provided 6 records of little egret comprising between 1 to 3 birds between 2011 and 2013. Fylde Bird Club data included a large number of records comprising between 1 to 8 birds. The wintering populations of little egret have increased markedly in recent years with the species distribution gradually expanding northwards (Balmer *et al*., 2013).

Field Surveys

3.3.25 Little egret was recorded in small numbers throughout the winter and passage period. All little egret records (including flight and foraging/roosting records) are shown on Tables B-7 and B-8, in Annex B, and on Figure 6, in Appendix 1 of the HRA (document reference TR010035/APP/5.4).

3.3.26 Little egret was recorded on 64 occasions throughout the 2016-17 wintering and passage period of which 51 were recorded on the ground (Refer to Table B-7 in Annex B). Seventeen observations of between 1 to 5 birds were recorded in Area 5. There were 3 sightings of 1 or 2 birds in Area 1 and a further 2 records of 1 to 7 birds in Area 2. The remaining records all related to birds either on or immediately adjacent to the River Wyre (Area 6).

3.3.27 Little egret showed a similar pattern of activity in 2017-18 when 60 observations were recorded, all but one were ground records (refer to Table B-8 in Annex B). Fourteen of the sightings of between 1 and 3 birds were within Area 5, 4 sightings of 1 or 2 birds were within Area 2 and there was 1 record of a single bird in Area 1. The remaining records all related to birds on the River Wyre in Area 6, or immediately adjacent habitats in Areas 3 and 4.

Summary

3.3.28 Given that 1 bird equates to 1% of the SPA population, all sightings would represent 1% of the SPA population. Therefore, the peak count of 11 birds in Area 6 (September 2016) equates to 8% of the SPA population. The majority of the records related to individual birds.

Shelduck (Autumn Passage and Winter)

Desk Study

3.3.29 LERN provided a single record for shelduck comprising a single bird recorded in February 2012. The Fylde Bird Club data included 29 records of shelduck between 2009 to 2015. None of the records comprised flocks above the 1% SPA population threshold with a peak count of 30 birds at Little Singleton in December 2012.

Field Surveys

3.3.30 Six observations of between 1 and 9 shelduck were recorded along the river during the 2016 autumn passage surveys in land parcels 27 and 28 (Area 6). A single shelduck was recorded outside of the estuarine habitats on the nearest pond to Windy Harbour Road junction, in land parcel 12 (Area 3).

3.3.31 Only 1 record comprising 2 shelduck was recorded during the 2017 autumn passage surveys. The birds were recorded on the River Wyre towards the eastern extent of the Scheme.

3.3.32 Small numbers of shelduck continued to be recorded throughout the 2016–17 winter period with a further 42 records of between 1 and 9 birds. Eleven of the records were located within close proximity to the Scheme with the remainder either within the Estuary or on fields over 350m from the Scheme.

3.3.33 Eighty-six sightings of shelduck were recorded between mid-November 2017 to April 2018. Two flocks comprising 1% or greater of the SPA population (70 and 79 birds) were recorded in February 2018, both on the River Wyre near Shard Bridge. Of the remaining observations, 22 were within Areas 1, 2 and 5 which would be affected by the Scheme with a peak count of 7 birds. All remaining observations were within Area 6 on the River Wyre or in adjacent fields within Areas 3 and 4.

Summary

3.3.34 Throughout the survey period, there were 2 flocks of shelduck above the 1% threshold recorded during the winter/passage surveys in 2017-18 with a peak count of 79 birds. Both of these records were within the River Wyre. Inland, the largest flock recorded was 9 birds in Area 1 which equates to less than 0.2% of the SPA population. Therefore, overall, the habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for shelduck.

Redshank (Passage and Winter)

Desk Study

3.3.35 LERN did not provide any desk study records for redshank. The Fylde Bird Club data included 21 records between 2008 to 2013. Two records were associated

with 1% or greater of the SPA population with a peak count of 400+ birds in September 2008 at Skippool Creek and 140 birds on the River Wyre at Little Singleton in December 2009 (both in Area 6).

Field Surveys

3.3.36 Redshank were recorded foraging and roosting on the River Wyre and the adjacent estuarine habitats on each of the 2016 autumn passage survey visits. All of the records were observed within Areas 4 and 6 (land parcels 18, 19, 27, 28 and 29). Redshank distribution was influenced by the tidal state with birds foraging along the sections of the river mudflats exposed by the tidal retreat. A peak count of 55 birds was recorded during the survey visit on 28 October 2016. Two smaller flocks of 11 and 20 birds were also observed foraging on the exposed muddy banks of the river during this visit along with a small number of records of between 1 and 11 birds. Numbers fluctuated throughout the 2016 autumn passage surveys dependent on the tidal state with the larger flocks being recorded during mid-high tide; however, none were 1% or greater of the SPA population.

3.3.37 A similar distribution was recorded during the 2017 autumn passage surveys with all redshank observations occurring along the River Wyre or on Skippool Creek at the northern extent of the Scheme. A peak flock size of 71 birds was recorded on 18 October 2017 on the northern bank of the River Wyre, with a further 2 flocks of 41 and 50 birds observed at the mouth of Skippool Creek on 17 October. During the 2 visits in September 2017, 6 flocks ranging from 22 to 42 with the remaining 37 records comprising fewer than 18 birds with most relating to 1–5 birds. Again, none were 1% or greater of the SPA population.

3.3.38 Redshank were also present throughout the remainder of the winter period and spring passage with 110 records from mid-November 2016 to April 2017, although none were 1% or greater of the SPA population. The majority of the sightings related to birds on or immediately adjacent to the Estuary, north of the Scheme. Only 6 records related to birds utilising fields inland with 5 records from land parcel 3, comprising 1 record of 71 and 1 record of 51 birds with the remaining records fewer than 6 birds, foraging on the permanent flash of the arable farmland; and 1 record of 4 birds to the east within land parcel 4. All the records within these fields were over 650m to the south of the Scheme.

3.3.39 During the winter and spring passage surveys from mid-November 2017 to April2018, there were 122 observations of redshank. One of the recordings related to 120 birds which is just over 1% of the SPA redshank population, this flock was recorded on the Estuary close to Shard Bridge. All of the remaining sightings were of fewer than 55 birds. Six records related to birds within Area 5 with a peak count in this area of 7 birds and 4 records related to birds in Area 1 with a peak count of 5 birds. All of the remaining observations of redshank were within Area 6 on the River Wyre or within Areas 3 and 4 in close proximity to the Estuary.

Summary

3.3.40 Despite the relatively large number of records of redshank throughout the 2-year survey period, there was only 1 flock above the 1% or greater threshold recorded

during the winter/passage surveys (the peak count of 120 birds in Area 6 equates to 1.1% of the SPA population). Within fields that would be affected by the Scheme, a peak count of 71 birds (0.6% of the SPA population) was recorded in Area 1. Therefore, overall, the habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for redshank.

Oystercatcher (Autumn Passage and Winter)

Desk Study

3.3.41 LERN did not provide any desk study records for oystercatcher. Fylde Bird Club data identified 16 records between 2009 and 2013 with a peak count of 21 birds on the River Wyre at Little Singleton.

Field Surveys

3.3.42 Oystercatcher were observed on 4 occasions during the 2016 autumn passage surveys. Two of the observations were of birds flying over the river. A peak count of 35 birds, was seen foraging on the edge of Skippool Creek and the saltmarsh on the south bank of the river between land parcel 18 and 27. A second flock of 11 birds was observed on the north bank of the Estuary in land parcel 27.

3.3.43 A single oystercatcher was recorded in Area 5, close to the Scheme during the November 2017 passage surveys. There were no other observations of oystercatcher during the 2017 autumn passage surveys.

3.3.44 Oystercatcher was observed sporadically throughout the early winter period with no records in December 2016, 1 record in January 2017 and 2 records in February 2017 (including a single flock of 21 birds). Forty-two records of oystercatcher were recorded in March 2017 although these generally related to between 1 and 3 birds with a single record of 7 birds being the peak count. The majority of these sightings were again related to the Estuary.

3.3.45 A similar pattern was recorded in 2017-18 with a single record of 5 birds from December 2017, no records in January 2018 and 6 records of between 1 and 6 birds in February 2018. There were 35 records in March 2018, 1 record related to 8 birds with the remaining records being of 1-4 birds. A further 33 records were identified in April 2018 again comprising small numbers of birds with a peak count of 7 birds. Only 8 of the total number of records were within habitats that could be affected by the Scheme.

Summary

3.3.46 Throughout the survey period, there were no flocks of oystercatcher above the 1% or greater threshold recorded during the winter/passage surveys (the peak count of 21 birds equates to less than 0.1% of the SPA population). The majority of records were related to the Estuary and adjacent habitats. Overall, the habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for oystercatcher.

Golden Plover (Autumn passage and Winter)

Desk Study

3.3.47 LERN provided a single record for golden plover comprising a single bird recorded in August 2013. The Fylde Bird Club data included 4 records of golden

plover between 2009 to 2015. Only 1 record comprised a flock above the 1% or greater SPA population threshold with a peak count of 33 birds at Shard Bridge Farm in September 2013.

Field Surveys

3.3.48 Four observations of golden plover were recorded during the 2016/2017 autumn passage and winter surveys, 2 of which related to birds in flight. The remaining 2 records related to foraging or roosting birds and both comprised 1% or greater of the SPA population. A flock of 200 birds was recorded on the edge of the River Wyre in Area 4 (Land Parcel 18) in September 2016 and 32 birds overserved within the Estuary in Land Parcel 27 (Area 6) recorded in October 2016.

3.3.49 Seventeen sightings of golden plover were recorded between end-September 2017 to March 2018, 12 of which related to flocks of 1% or greater of the SPA population. Only 1 flock comprising 1% or greater of the SPA population (70 birds) was recorded away from the River Wyre with 70 birds recorded in Area 1 (Land Parcel 5) in February 2018. The remaining 11 records comprising flocks of 1% or greater were all within Land Parcels 27 or 28 in Area 6. Three of the remaining observations, were within Areas 5 which would be affected by the Scheme; however, a peak count of 3 birds was recorded in this location. The other 2 small flocks were within Area 6 on the River Wyre.

Summary

Throughout the survey period, there were 14 flocks of shelduck above the 1% or greater threshold recorded during the winter/passage surveys with a peak count of 397 birds. All but 1 of these records were within the River Wyre. Inland, the largest flock recorded was 70 birds in Area 1, over 300 m from the Scheme. Only 3 flocks of 2 or 3 birds were recorded utilising habitats in Area 5 which could be affected by the Scheme. Therefore, overall, the habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for golden plover.

Lesser Black-backed Gull (Autumn passage and Winter)

Desk Study

3.3.50 LERN did not provide any desk study records for lesser black-backed gull. Fylde Bird Club provided 11 records between 2011 and 2015 with a peak count of 30 birds at Little Singleton in April 2011.

Field Surveys

3.3.51 Lesser black-backed gull was recorded throughout the Bird Survey Area during the 2016 autumn passage survey visits, with a peak count of 130 being observed on the Estuary, west of Shard Bridge, during the first survey visit on 23 September 2016. The remaining records from the autumn related to between 1 and 22 birds with only 3 records (of fewer than 3 birds) close to the Scheme in land parcels 23 and 5.

3.3.52 During the 2017 autumn passage period, a peak count of 85 birds was observed, again on the Estuary west of Shard Bridge. Two sightings of 3 birds were within Area 1 and close to the Scheme with the remaining observations of between 1 and 32 birds being on or adjacent to the Estuary.

3.3.53 A further 132 lesser black-backed gull sightings were recorded during the 2016–17 winter period and spring passage, over half of which related to birds in flight within the Bird Survey Area, including 1 record of 120 birds flying over in April 2017. A peak count of 40 birds was recorded on 2 occasions during the March surveys with both records associated with Area 4. The remaining records were for individuals or small flocks of below 20 birds with the majority of foraging records associated with the Estuary and adjacent habitats.

3.3.54 Fifty-two records of lesser black-backed gull were identified during the winter period and spring passage in 2017-18. The majority of the records were again associated with the Estuary and adjacent habitats with a peak count of 30 birds in land parcel 27. A small number of birds were recorded in Areas 1, 2 and 5, close to the Scheme, with a peak count of 25 birds within Area 1 recorded in April 2018.

Summary

3.3.55 Throughout the survey period, there was only 1 flock of lesser black-backed gull above the 1% threshold recorded on the ground during the winter/passage surveys (the peak count of 130 birds in survey area 6 equates to 1.3% of the SPA population). Given that this single record relates to the estuarine habitat, and the remaining records of lesser black-backed gull were below the 1% threshold, the habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for lesser black-backed gull.

Cormorant (Autumn)

Desk Study

3.3.56 LERN provided 1 record of a single juvenile cormorant in February 2014. Fylde Bird Club provided 3 records between 2011 and 2014 with a peak count of 3 birds recorded at Little Singleton in June 2011.

Field Surveys

3.3.57 Cormorant were recorded throughout the 2016 autumn passage survey visits foraging within the Bird Survey Area. They were closely associated with the river and estuarine habitats, with all but 1 of the 18 records of foraging, roosting or wing-spreading cormorant being observed in land parcels 18, 27 and 28. The peak count of 8 cormorant was recorded on 30 September 2016 at the point where Skippool Creek meets the River Wyre within land parcel 18 (Area 4).

3.3.58 Cormorant were not recorded during the 2017 autumn passage surveys.

Summary

3.3.59 Throughout the survey period, there were no flocks of cormorant above the 1% threshold recorded during passage surveys (the peak count of 8 birds equates to 0.8% of the SPA population). A peak count of 13 birds was recorded during the winter within Area 3 to the north of the eastern end of the Scheme. The majority of records were related to the Estuary and adjacent habitats. Overall, the habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for cormorant.

Dunlin, black-tailed godwit, knot, red-breasted merganser, wigeon and ringed

plover

Desk Study

3.3.60 LERN did not provide any desk study records for these species. Fylde Bird Club records included 2 records, including 1 of over 1,500 birds at Skippool Creek in August 2008; 2 records of black-tailed godwit with a peak count of 10 birds on the Wyre Estuary at Little Singleton in March 2010; 1 record of 12 knots at Little Singleton in October 2009; and 2 records of approximately 20 wigeon from Little Singleton in October 2012 and November 2013.

Field Surveys

3.3.61 All of these species were recorded sporadically in small numbers throughout the 2 seasons of winter and passage surveys.

3.3.62 Dunlin were recorded 28 times, all within Areas 3, 4 and 6 on or immediately adjacent to the Estuary. A peak count of 400 was recorded on one occasion in March 2018 (1.48% of the SPA population). All remaining sightings were below 1% of the SPA population with the majority of the observations being below 50 birds.

3.3.63 Wigeon were recorded 39 times, with a peak count of 60 birds (0.9% of the SPA population) in Area 1. A small number of larger flocks (7 records of between 63–140, and therefore over 1% of the SPA population) were recorded on the Estuary in Land Parcel 28 during the 2017/18 winter.

3.3.64 Black-tailed godwit was recorded on 6 occasions throughout the 2-year survey period. Once within Area 1 (6 birds, 0.1% of the SPA population), once within Area 4 with a single bird identified in Land Parcel 17, twice within Area 5, with a flock of 5 birds records on the ground in Land Parcel 25 and a flock of 39 birds flying though and twice within Area 6 with 1 flock of 73 recorded on the Estuary in Land Parcel 27.

3.3.65 A single flock of 170 knot (0.5% of the SPA population) was observed in Area 1 during the survey on 23 September 2016. Knot were not recorded during the 2017-18 surveys.

3.3.66 Ringed plover was recorded on 2 occasions, both in November 2016, with a single bird recorded in Area 3 and another individual recorded in Area 6. Ringed plover was not recorded during the 2017-18 surveys.

3.3.67 Finally, a single sighting of 2 red-breasted merganser (0.6% of the SPA population) was recorded in Area 6 on 7 October 2016. Red-breasted merganser was not recorded during the 2017-18 surveys.

Summary

3.3.68 Throughout the survey period, none of these species were utilising farmland habitats in numbers above the 1% threshold populations. The habitats that would be affected by the Scheme are not considered to constitute functionally-linked land for these species.

Overwintering Waterbird Assemblage

3.3.69 In addition to the individual qualifying features (discussed above), the waterbird assemblage is also a qualifying feature of both the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site, as outlined in Table 3-1, above.

Field Surveys

3.3.70 Birds which could make up the waterbird assemblage associated with Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site were recorded throughout the winter surveys. A total of 41 species was recorded during the 2016–2017 surveys, and a total of 37 species was recorded during the 2017–2018 winter bird surveys. These are listed in Table 3-8, below.

Table 3-8: Waterbird Species Recorded During the Wintering Bird Surveys (date in brackets where only recorded during 1 season)

Species			
Barnacle goose	Goldeneye (2017/18)	Lesser black-backed gull	Redshank
Black-headed gull	Goosander	Little egret	Ringed plover (2016/17)
Black-tailed godwit	Great Black-backed gull	Little grebe (2016/17)	Shelduck
Canada goose (2016/17)	Green sandpiper	Mallard	Shoveler (2017/18)
Common gull	Greenshank	Manx shearwater (2016/17)	Snipe
Common sandpiper (2017/18)	Greylag goose	Mediterranean gull (2016/17)	Teal
Coot (2016/17)	Grey plover (2017/18)	Moorhen (2016/17)	White-fronted goose
Cormorant	Herring gull	Mute swan	Whimbrel (2017/18)
Curlew	Jack snipe (2016/17)	Oystercatcher	Whooper swan
Dunlin	Kingfisher	Pink-footed goose	Wigeon
Gadwall	Knot (2016/17)	Pintail (2017/18)	Woodcock (2017/18 only)
Golden plover	Lapwing	Red-breasted merganser (2016/17)	Yellow legged gull (2016/17)

3.3.71 Excluding those species already discussed as individual qualifying species, above, the field survey results indicate that the majority of birds which would constitute the waterbird assemblage were recorded utilising the River Wyre and adjacent habitats (Area 6). The largest aggregations of birds were recorded on the mudflats adjacent to the River.

3.4 Breeding Bird Survey

3.4.1 The results of the 2017 breeding bird surveys are described in the following sections. Detailed results tables are provided in Annex C.

Morecambe Bay and Duddon Estuary SPA and Ramsar Site Qualifying Species

3.4.2 Two Morecambe Bay and Duddon Estuary SPA qualifying species were observed during the 2017 breeding bird transect surveys: herring gull and lesser black-backed gull. Table 3-9 shows the peak counts of each of the qualifying species recorded during the breeding bird surveys and the time of day (dusk or dawn) during which the survey was undertaken.

Table 3-9: Peak Count of Qualifying Species During Breeding Bird Surveys

Species	Qualifying feature	Peak count		
		April	May	June
Herring gull	Morecambe Bay and Duddon Estuary SPA/ Criterion 6 Ramsar site species (during breeding season)	13 (dusk)	3 (dawn)	1 (dawn)
Lesser black-backed gull		7 (dusk)	5 (dawn)	22 (dawn)

Herring Gull

Desk Study

3.4.3 Fylde Bird Club provided 6 records of herring gull within 500m of the Scheme during the breeding season (between 2011 and 2015). The records related to between 1 and 4 birds with no confirmed breeding birds identified.

Field Surveys

3.4.4 Herring gull were recorded on 26 occasions during the breeding bird surveys, 10 of which related to birds flying over the Bird Survey Area rather than utilising habitats on the ground.

3.4.5 Herring gull were recorded foraging or roosting during each survey visit throughout the breeding season. All but 2 of the observations related to either 1, 2 or 3 birds. The remaining 2 records related to 13 birds foraging/roosting on the banks of the River Wyre to the east of land parcel 29 and 9 birds utilising low-lying waterlogged ground to forage in land parcel 24: both recorded during the April 2017 surveys.

3.4.6 The abundance of herring gulls recorded utilising the Bird Survey Area decreased throughout the breeding season: 10 records of between 1 to 13 birds in April, 5 records of between 1 to 3 birds in May and 1 record of a single bird in June (Table C-1 in Annex C). No confirmed nesting sites were recorded during the surveys.

Summary

3.4.7 The breeding bird surveys indicate that the Bird Survey Area is only utilised by herring gulls in small numbers and on a sporadic basis for foraging during the breeding season.

Lesser Black-backed Gull

Desk Study

3.4.8 Fylde Bird Club provided 9 records of lesser black-backed gull within 500m of the Scheme during the breeding season (between 2011 and 2015). The records related to between 1 and 30 birds. No confirmed sightings of breeding activity were recorded.

Field Surveys

3.4.9 Lesser black-backed gull was observed on 20 occasions during the breeding season, 1 of which related to birds flying over the Bird Survey Area (Table C-2 in Annex C). All but 6 of the observations related to birds utilising the estuarine habitats along the River Wyre (Area 6). The majority of the observations related to small groups of between 1 to 5 birds. A flock of 7 was recorded in April on the River Wyre east of land parcel 29. In June, 2 flocks of 11 and 22 birds were recorded foraging on the River Wyre at Skippool Creek in land parcel 27. No confirmed nesting sites were recorded during the surveys.

Summary

3.4.10 The breeding bird surveys indicate that the survey area is only utilised by lesser black-backed gulls in small numbers and on a sporadic basis for foraging during the breeding season, with the riverine habitats most frequently used.

Seabird Assemblage

3.4.11 Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site are also designated for supporting and important seabird assemblage during the breeding season. The majority of birds which would constitute the seabird assemblage are associated with marine and coastal habitats to the north of the Scheme. Only 2 species associated with the seabird assemblage were recorded during the bird surveys, these comprised herring gull and lesser black-backed gull as described individually above. Neither species was identified to be breeding within the Bird Survey Area.

4 REFERENCES

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ANNEX A – Survey Timings and Weather

Table A- 1: Wintering and passage bird survey timings - Area 1:

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation Rain R Snow S
23/09/2016	P	13:05	14:30	Mid	16	2-3	S	3	1	0
30/09/2016	P	11:30	13:05	High	11	2-3	W	2	4	R = 3
07/10/2016	W/P	11:15	13:30	Mid	11	3-4	E	3	8	R = 1
21/10/2016	W/P	11:15	12:50	Low	10	0	No data	3	4	0
28/10/2016	W/P	10:15	12:15	High	13	1	NW	3	8	0
11/11/2016	W	08:34	10:10	High	2	0	No data	3	2	0
16/11/2016	W	06:15	08:40	Low	11	5	SW	1	8	R = 2
25/11/2016	W	08:25	10:15	High	1	0	No data	3	0	0
02/12/2016	W	08:35	10:15	Mid	9	0	No data	3	8	0
09/12/2016	W	08:25	10:15	Mid	10	1	SW	3	8	0
13/12/2016	W	15:45	17:40	Mid	9	4	SE	2	8	R = 2
18/01/2017	W	11:29	13:20	Mid	9	2	E	3	8	0
19/01/2017	W	07:35	09:10	Mid	6	0	No data	2	8	0
26/01/2017	W	10:03	11:01	High	5	4	S	2	8	0
17/02/2017	W	13:03	14:39	Mid	11	1	S	3	6	0
03/03/2017	W/P	11:20	12:46	Mid	7	3	SE	2	8	R = 2
13/03/2017	W/P	11:15	13:05	High	10	4	W	2	8	0
22/03/2017	W/P	07:00	08:45	Mid	5	3	SE	0	8	R = 2
29/03/2017	W/P	05:20	07:05	Mid/Low	10	1	S	0	8	R = 2
30/03/2017	W/P	09:04	11:45	Mid	14	3	S	3	8	R = 2
05/04/2017	P	11:30	14:30	Mid	13	5	W	3	4	R = 1
12/04/2017	P	19:00	21:45	Low/Mid	11	5	No data	3	2	0
12/04/2017	P	15:50	18:00	Mid	15	5	S	3	3	0
19/04/2017	P	15:30	17:30	Mid	18	2	SW	3	8	0

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation Rain R Snow S
27/04/2017	P	16:04	17:56	Mid	14	4	W	3	3	0

P = Passage: September to October and March to April
W = Winter: October – March

Table A- 2: Wintering and passage bird survey timings - Area 2

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
23/09/2016	P	10:50	12:00	Low	16	2-3	S	3	3	0
30/09/2016	P	09:30	11:15	Mid	10	2-3	W	2-3	5	R = 3
07/10/2016	W/P	09:10	10:52	Mid	11	3-4	E	3	8	R = 1
14/10/2016	W/P	09:30	11:00	High	11	2-3	E	3	2	0
21/10/2016	W/P	09:10	10:40	Low	8	0	No data	3	6	0
28/10/2016	W/P	09:25	10:42	High	12	3	NW	3	8	0
11/11/2016	W	08:50	10:15	High	3	1	S	2	0	0
17/11/2016	W	08:40	10:10	Low	-1	1	NE	3	0	0
25/11/2016	W	08:40	10:10	High	-1	1	NE	3	0	0
02/12/2016	W	08:50	10:20	Mid	8	0	No data	Mod?	8	0
09/12/2016	W	08:35	11:40	Mid	11	1	S	2	8	0
13/12/2016	W	15:50	17:07	Mid	9	2	S	1	8	0
19/01/2017	W	09:53	11:55	Mid	8	0	No data	2	8	0
20/01/2017	W	07:36	09:17	Mid	7	0	No data	1	8	0
25/01/2017	W	10:40	12:20	Mid	6	0	No data	3	0	0
16/02/2017	W	13:25	15:00	Mid	10	5	SW	2	7	0
02/03/2017	W/P	10:10	12:10	Mid	8	2	No data	3	1	0
17/03/2017	W/P	11:22	13:22	Mid/High	9	6	SW	3	8	R = 1
20/03/2017	W/P	11:00	12:30	Mid	8	4	W	1	8	0
28/03/2017	W/P	05:30	07:01	Mid/Low	4	2	SE	3	1	0
29/03/2017	W/P	08:30	10:20	Mid	11	1	S	1	8	R = 2
05/04/2017	P	11:00	13:45	Mid/Low	11	4	W	3	4	0
12/04/2017	P	15:40	17:50	Mid	15	5	No data	3	1	0
18/04/2017	P	19:00	21:00	Mid	10	1	No data	3	8	0
19/04/2017	P	15:32	17:24	Mid/High	13	2	SW	3	8	0
27/04/2017	P	16:00	18:00	Mid	14	5	S	3	5	0

Table A- 3: Wintering and passage bird survey timings - Area 3

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
23/09/2016	P	10:23	14:50	Low	No data	No data	No data	No data	No data	No data
30/09/2016	P	09:30	11:20	Mid	12	1	W	3	7	R = 3
07/10/2016	W/P	08:58	11:15	Low	15	2	W	3	8	0
07/10/2016	W/P	09:20	11:20	Low	14	3	E	2	8	0
14/10/2016	W/P	09:15	12:15	High	15	2	E	2	7	0
21/10/2016	W/P	08:05	09:59	Low	9	1	SE	3	6	0
28/10/2016	W/P	09:26	11:20	High	13	0-1	No data	3	8	0
11/11/2016	W	08:45	No data	High	No data	1	SE	3	1	0
11/11/2016	W	10:25	11:00	Mid	6	1-2	NW	0	0	0
17/11/2016	W	06:20	09:09	Low	5	6	SW	2	6	R = 3
25/11/2016	W	10:35	12:30	Mid	1.5	1	NE	3	0	0
02/12/2016	W	08:50	11:49	Mid	7	0-2	NE	3	8	0
02/12/2016	W	10:25	11:05	Mid	9	0	No data	3	8	0
09/12/2016	W	08:35	No data	Mid	12	0	No data	2	8	R = 1-2
15/12/2016	W	06:40	08:40	Low	9	0	No data	2	8	0
18/01/2017	W	07:19	10:30	Mid	8	0	No data	2	8	0
19/01/2017	W	09:50	12:30	Mid	9	0	No data	2	8	0
26/01/2017	W	09:36	13:22	Mid	1	2	S	2	7	0
17/02/2017	W	15:10	16:40	High	11	2	S	2	7	0
02/03/2017	W/P	12:13	12:45	Mid	8	2	No data	3	1	0
17/03/2017	W/P	11:30	13:45	Mid/High	9	6	SW	2	8	R = 2
21/03/2017	W/P	08:30	10:15	Mid	6	6	W	2	4	0
29/03/2017	W/P	08:26	11:19	Mid	11	1	S	2	8	R = 2
30/03/2017	W/P	05:16	08:04	Mid/Low	13	3	S	3	7	0
06/04/2017	P	15:30	17:20	Low/Mid	10	2	No data	3	8	0
11/04/2017	P	10:00	12:34	Mid/High	10	3	W	3	6	0

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
19/04/2017	P	13:00	15:40	Mid	13	3	W	3	8	0
27/04/2017	P	19:00	21:45	Low/Mid	11	3	S	3	5	0
28/04/2017	P	11:15	12:50	Mid	8	0	No data	3	8	R = 1

P = Passage: September to October and March to April
W = Winter: October – March

Table A- 4: Wintering and passage bird survey timings - Area 4

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
23/09/2016	P	No data	No data	No data	No data	No data	No data	No data	No data	No data
30/09/2016	P	09:50	11:57	High	No data	No data	No data	No data	No data	No data
07/10/2016	W/P	No data	No data	No data	No data	No data	No data	No data	No data	No data
14/10/2016	W/P	No data	No data	No data	No data	No data	No data	No data	No data	No data
21/10/2016	W/P	10:45	12:25	Mid	12	1	SE	2	6	0
28/10/2016	W/P	11:00	12:00	Mid	13	2	SW	2	8	0
11/11/2016	W	10:05	11:34	Mid	2	0	No data	3	2	0
16/11/2016	W	06:20	09:02	Low	8	6	NW	1	8	0
25/11/2016	W	09:50	11:32	Mid	5	0	No data	3	0	0
02/12/2016	W	09:50	11:34	Mid	6	0	No data	2	2	0
09/12/2016	W	09:48	12:17	Mid	12	0	No data	2	8	0
12/12/2016	W	03:00	04:16	Low	11	0	No data	No data	8	No data
12/12/2016	W	15:31	16:21	Low	12	1	SE	2	5	R = 1-2
20/01/2017	W	09:30	11:45	Mid	6	2	S	1-2	5	0
25/01/2017	W	10:22	12:26	Mid	7	0-3	W	3	0	0
26/01/2017	W	07:29	09:25	Mid	-2	2	S	2	8	0
16/02/2017	W	13:24	15:47	Mid/High	8	4-5	E	3	7	0-1
17/02/2017	W	17:10	18:10	Mid	12	1	S	2	7	0
01/03/2017	W/P	10:05	12:22	Mid/High	5	3	E	3	8	0
17/03/2017	W/P	09:00	10:40	Mid	7	4	W	1	8	R = 2
20/03/2017	W/P	10:56	13:06	Mid	9	3	W	3	8	0
21/03/2017	W/P	05:03	07:05	Mid	5	4	SW	2	4	0
28/03/2017	W/P	09:02	11:10	Mid	6	2	SE	3	0	0
04/04/2017	P	12:00	16:30	Low/Mid	12	3	W	3	2	0
05/04/2017	P	05:45	09:25	Mid	10	4	W	3	4	0
11/04/2017	P	10:30	No data	Mid	10	3	W	3	6	0

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
18/04/2017	P	15:28	17:36	Mid	10	1	No data	3	8	0
28/04/2017	P	12:40	14:25	Mid	8	2	NE	1	1	0

P = Passage: September to October and March to April
W = Winter: October – March

Table A- 5: Wintering and passage bird survey timings - Area 5

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
23/09/2016	P	No data	No data	No data	No data	No data	No data	No data	No data	No data
30/09/2016	P	12:15	14:15	High	No data	No data	No data	No data	No data	No data
07/10/2016	W/P	No data	No data	No data	No data	No data	No data	No data	No data	No data
14/10/2016	W/P	No data	No data	No data	No data	No data	No data	No data	No data	No data
21/10/2016	W/P	09:15	10:45	Low	12	2	N	2	2	0
28/10/2016	W/P	09:00	10:50	Mid	13	7	SE	1	8	0
11/11/2016	W	08:50	10:04	High	8	0	No data	3	1	0
21/11/2016	W	06:45	07:55	Low	3	2	NW	3	8	0
25/11/2016	W	08:28	09:42	High	1	0	No data	3	0	0
02/12/2016	W	08:37	09:43	Mid	5	0	No data	2	8	0
09/12/2016	W	08:24	09:44	Mid	12	2	S	2	8	R = 0-1
14/12/2016	W	15:30	No data	Mid	11	3	SE	3	1	0
20/01/2017	W	09:35	10:48	Mid	6	2	S	1-2	6	0
25/01/2016	W	07:44	09:10	Mid	-1	0	No data	3	0	0
26/01/2016	W	11:11	12:22	Mid	0.5	3	S	2	8	0
16/02/2017	W	16:20	18:05	Mid	9	3	E	2	7	0
17/02/2017	W	13:10	14:30	Mid	11	2	S	2	8	0
01/03/2017	W/P	08:34	11:40	Mid	11	1	No data	3	5	R = 2
17/03/2017	W/P	08:22	09:25	Low/Mid	7	4	E	3	8	R = 2
21/03/2017	W/P	08:20	09:50	Mid	6.5	5	SW	3	3	0
22/03/2017	W/P	05:20	06:40	High/Mid	4	3	E	1	8	R = 2
28/03/2017	W/P	08:55	10:15	Mid	6	2	SE	1	0	0
05/04/2017	P	08:30	10:20	Mid	10	5	SW	2	1	0
06/04/2017	P	18:30	21:00	Mid/High	10	1	No data	3	8	0
11/04/2017	P	08:50	10:05	Mid	10	3	E	2	3	0
18/04/2017	P	15:30	17:30	Mid	12	1	No data	3	3	0

Date	Winter/ passage	Start	Finish	Tide	Temp (°C)	Wind Speed (Beaufort)	Wind Direction	Visibility	Cloud Cover (Oktas)	Precipitation - Rain R Snow S
28/04/2017	P	11:15	12:35	Mid	7	3	NE	1	1	0

P = Passage: September to October and March to April
W = Winter: October – March

ANNEX B – Passage and Wintering Bird Survey Results (qualifying species)

Table B- 1: Pink-footed goose ground records (2016-2017)

Date	Area	Number of birds	Comment
30/09/2016	3	1	
11/11/2016	1	8	
17/11/2016	6	1	
25/11/2016	1	7	
02/12/2016	1	1,400	
02/12/2016	1	25	
02/12/2016	1	3	
09/12/2016	1	3,400	Feeding in autumn sown cereal. 1,000 were flushed
09/12/2016	6		Unknown number landed to roost
13/12/2016	2	1,500	Estimate, low light
15/12/2016	3	165	Leaving roost flying SW to NE 80-150m
18/01/2017	3	300	Roosting/foraging in 2 adjacent fields
18/01/2017	2	500	Landed
18/01/2017	2	260	Landed
18/01/2017	1	90	
20/01/2017	4	800	Foraging
26/01/2017	2	90	
25/01/2017	6	300	Grazing in field possibly lured by decoys present
25/01/2017	6	250	Grazing in fields possibly lured by decoys present
02/03/2017	6	2	
22/03/2017	1	1	Foraging

Table B- 2: Pink-footed goose ground records (2017-2018)

Date	Survey Area	Number of birds	Comment
20/09/2017	2	70	
04/10/2017	6	267	
13/10/2017	2	41	
18/10/2017	6	1	
25/10/2017	3	530	530 estimate 200m SE of marker
28/11/2017	6	100	Dusk
19/12/2017	2	60	
08/01/2018	2	160	
08/01/2018	4	1,600	Incidental record. Landowner says first time in 2 years.
09/01/2018	3	160	
09/01/2018	3	220	
09/01/2018	4	2,500	feeding in field, more landed when counting
09/01/2018	5	134	
22/01/2018	3	400	
23/01/2018	1	250	
23/01/2018	2	400	
23/01/2018	2	35	
05/02/2018	2	600	
05/02/2018	6	55	
05/02/2018	6	1	
06/02/2018	4	78	
19/02/2018	1	2	
20/02/2018	3	450	
20/02/2018	3	65	Seen landing in fields
08/03/2018	1	6	
08/03/2018	6	5,000	Total flock size over 7,500 birds
08/03/2018	6	2,500	
12/03/2018	6	6	day
13/03/2018	6	2,000	dawn
13/03/2018	6	10	dawn
19/03/2018	6	300	day
19/03/2018	6	2,000	day
27/03/2018	3	18	day
27/03/2018	6	3	day
06/04/2018	3	475	day
10/04/2018	3	400	day

Table B- 3: Curlew ground records (2016 - 2017)

Date	Survey Area	Number of birds	Date	Survey Area	Number of birds	Date	Survey Area	Number of birds
23/09/2017	3	1	28/10/2017	5	3	16/02/2018	4	1
23/09/2017	6	35	28/10/2017	5	2	16/02/2018	6	30
23/09/2017	4	3	28/10/2017	5	1	17/02/2017	3	28
23/09/2017	4	2	11/11/2017	1	14	17/02/2017	3	7
23/09/2017	4	2	11/11/2017	1	124	17/02/2017	3	42
23/09/2017	4	15	11/11/2017	2	4	17/02/2017	3	53
23/09/2017	5	2	11/11/2017	2	29	17/02/2017	4	1
23/09/2017	5	1	11/11/2017	6	2	17/02/2017	4	9
30/09/2017	3	2	11/11/2017	3	8	17/02/2017	4	30
30/09/2017	3	14	11/11/2017	6	40	17/02/2017	6	100
30/09/2017	3	5	11/11/2017	5	2	01/03/2017	4	1
30/09/2017	3	10	11/11/2017	5	1	01/03/2017	4	1
30/09/2017	3	1	11/11/2017	5	5	01/03/2017	4	1
30/09/2017	3	1	17/11/2017	2	2	01/03/2017	6	2
30/09/2017	3	1	17/11/2017	4	2	01/03/2017	6	1
30/09/2017	3	2	17/11/2017	4	2	01/03/2017	6	20
30/09/2017	4	1	17/11/2017	4	2	01/03/2017	6	1
30/09/2017	4	1	17/11/2017	4	11	01/03/2017	6	54
30/09/2017	4	1	17/11/2017	4	25	02/03/2017	3	1
30/09/2017	5	15	17/11/2017	4	27	02/03/2017	3	1
07/10/2017	3	1	17/11/2017	4	37	02/03/2017	6	63
07/10/2017	3	4	25/11/2017	6	2	02/03/2017	6	13
07/10/2017	3	2	25/11/2017	6	8	17/03/2017	4	1
07/10/2017	3	1	25/11/2017	6	1	17/03/2017	6	1
07/10/2017	3	28	25/11/2017	6	1	17/03/2017	6	1
07/10/2017	3	1	25/11/2017	6	11	20/03/2017	2	3
07/10/2017	4	1	25/11/2017	6	16	20/03/2017	6	8
07/10/2017	4	1	25/11/2017	2	1	20/03/2017	4	1
07/10/2017	5	8	25/11/2017	3	3	20/03/2017	4	1
07/10/2017	5	1	25/11/2017	4	2	20/03/2017	4	2
07/10/2017	5	1	25/11/2017	4	1	21/03/2017	3	1
14/10/2017	2	6	25/11/2017	5	6	21/03/2017	3	1
14/10/2017	6	30	25/11/2017	5	2	21/03/2017	4	9
14/10/2017	3	1	25/11/2017	5	38	21/03/2017	4	10
14/10/2017	3	15	25/11/2017	5	30	21/03/2017	4	2
14/10/2017	6	5	02/12/2017	3	16	28/03/2017	4	1
14/10/2017	4	1	02/12/2017	3	35	28/03/2017	4	2
14/10/2017	5	1	02/12/2017	3	9	28/03/2017	2	7
21/10/2017	2	6	02/12/2017	4	1	04/04/2017	4	1
21/10/2017	3	3	02/12/2017	4	1	04/04/2017	4	5
21/10/2017	3	45	02/12/2017	5	1	04/04/2017	4	3
21/10/2017	3	3	09/12/2017	1	46	04/04/2017	6	5
21/10/2017	3	14	09/12/2017	3	180	06/04/2017	6	64
21/10/2017	3	10	13/12/2017	1	1	11/04/2017	3	2
21/10/2017	3	1	13/12/2017	1	1	11/04/2017	3	4
21/10/2017	4	5	15/12/2017	3	1	11/04/2017	4	17
21/10/2017	6	1	15/12/2017	3	8	11/04/2017	6	1
28/10/2017	1	11	18/01/2017	6	1	19/04/2017	3	1
28/10/2017	3	5	25/01/2018	4	1	19/04/2017	3	2
28/10/2017	3	23	25/01/2018	6	40	19/04/2017	6	1
28/10/2017	4	1	26/01/2018	3	4	28/04/2017	3	15
28/10/2017	5	1	26/01/2018	3	5			

Table B- 4: Curlew ground records (2017-2018)

Date	Survey Area	Number of birds	Date	Survey Area	Number of birds	Date	Survey Area	Number of birds
19/09/2017	6	10	04/12/2017	6	142	08/03/2018	3	45
19/09/2017	6	3	04/12/2017	6	1	08/03/2018	3	11
21/09/2017	5	0	05/12/2017	6	200	08/03/2018	6	31
22/09/2017	3	17	05/12/2017	6	201	08/03/2018	6	2
22/09/2017	3	2	18/12/2017	3	3	08/03/2018	2	1
22/09/2017	6	1	18/12/2017	6	48	12/03/2018	3	43
22/09/2017	6	3	18/12/2017	6	81	12/03/2018	4	47
26/09/2017	4	10	18/12/2017	6	0	12/03/2018	6	1
26/09/2017	6	45	18/12/2017	6	2	13/03/2018	3	12
27/09/2017	3	2	19/12/2017	5	5	13/03/2018	6	5
27/09/2017	6	5	19/12/2017	5	120	13/03/2018	6	3
27/09/2017	6	0	19/12/2017	6	61	19/03/2018	3	5
04/10/2017	3	2	08/01/2018	6	3	19/03/2018	4	1
05/10/2017	6	1	08/01/2018	6	4	19/03/2018	4	21
05/10/2017	6	132	08/01/2018	6	2	19/03/2018	6	1
11/10/2017	3	14	08/01/2018	6	41	20/03/2018	5	1
11/10/2017	6	3	08/01/2018	6	2	26/03/2018	6	1
11/10/2017	6	1	09/01/2018	5	1	26/03/2018	6	1
12/10/2017	6	1	09/01/2018	5	1	26/03/2018	6	2
12/10/2017	6	4	09/01/2018	6	50	26/03/2018	6	4
12/10/2017	6	1	23/01/2018	6	400	27/03/2018	3	2
18/10/2017	6	31	05/02/2018	6	150	27/03/2018	4	6
24/10/2017	5	2	05/02/2018	6	76	27/03/2018	4	16
25/10/2017	6	2	06/02/2018	4	22	27/03/2018	4	2
25/10/2017	6	1	06/02/2018	4	45	05/04/2018	6	1
26/10/2017	6	3	06/02/2018	6	3	06/04/2018	3	2
31/10/2017	3	4	06/02/2018	6	1	06/04/2018	4	5
31/10/2017	6	1	06/02/2018	6	2	06/04/2018	4	3
31/10/2017	6	2	06/02/2018	6	5	06/04/2018	4	14
31/10/2017	6	1	19/02/2018	4	2	06/04/2018	6	1
01/11/2017	5	5	19/02/2018	6	140	06/04/2018	6	2
01/11/2017	6	7	20/02/2018	6	1	10/04/2018	3	10
02/11/2017	5	1	20/02/2018	6	11	10/04/2018	4	8
02/11/2017	5	1	20/02/2018	6	3	10/04/2018	4	4
14/11/2017	6	1	20/02/2018	6	3	10/04/2018	6	1
14/11/2017	6	7	20/02/2018	6	50	10/04/2018	6	20
15/11/2017	6	2	20/02/2018	6	12	16/04/2018	4	4
16/11/2017	6	6	21/02/2018	2	13	16/04/2018	4	1
16/11/2017	6	1	07/03/2018	2	7	16/04/2018	6	1
16/11/2017	6	0	07/03/2018	4	15	26/04/2018	4	2
28/11/2017	6	1	07/03/2018	5	4	26/04/2018	5	18
04/12/2017	1	7	07/03/2018	5	4			
04/12/2017	1	7	07/03/2018	6	50			

Table B- 5: Lapwing ground records (2016-2017)

Date	Survey Area	Number of birds	Date	Survey Area	Number of birds	Date	Survey Area	Number of birds
23/09/2016	1	3	11/11/2016	4	14	26/01/2017	1	40
23/09/2016	3	1	11/11/2016	4	41	25/01/2017	4	3
23/09/2016	3	2	11/11/2016	6	84	25/01/2017	4	0
23/09/2016	4	400	11/11/2016	6	7	25/01/2017	6	35
23/09/2016	4	8	16/11/2016	1	100	25/01/2017	4	400
23/09/2016	4	800	16/11/2016	4	230	25/01/2017	6	51
23/09/2016	6	16	16/11/2016	4	20	16/02/2017	6	2
30/09/2016	3	100	16/11/2016	4	530	16/02/2017	6	1
30/09/2016	3	50	17/11/2016	3	2	16/02/2017	5	0
30/09/2016	3	25	21/11/2016	5	1	16/02/2017	5	0
30/09/2016	4	10	21/11/2016	5	1	16/02/2017	5	0
30/09/2016	4	0	21/11/2016	5	10	17/02/2017	4	8
30/09/2016	4	90	21/11/2016	5	5	17/02/2017	4	200
30/09/2016	4	48	25/11/2016	1	80	17/02/2017	1	52
30/09/2016	4	78	25/11/2016	1	90	17/02/2017	3	62
30/09/2016	4	40	25/11/2016	2	1	17/02/2017	3	25
30/09/2016	4	93	25/11/2016	3	1	17/02/2017	3	31
30/09/2016	5	35	25/11/2016	6	7	17/02/2017	3	100
07/10/2016	1	100	25/11/2016	6	25	17/02/2017	3	320
07/10/2016	1	36	25/11/2016	6	81	01/03/2017	4	1
07/10/2016	1	25	25/11/2016	6	21	03/03/2017	1	1
07/10/2016	6	6	25/11/2016	6	46	03/03/2017	1	54
07/10/2016	6	82	25/11/2016	6	21	13/03/2017	1	19
07/10/2016	3	43	02/12/2016		400	22/03/2017	1	2
07/10/2016	3	45	02/12/2016	6	155	22/03/2017	1	4
07/10/2016	4	126	02/12/2016		1	22/03/2017	1	1
07/10/2016	4	12	02/12/2016	6	1	22/03/2017	1	1
07/10/2016	5	24	02/12/2016	6	800	29/03/2017	1	1
14/10/2016	6	70	02/12/2016	4	7	29/03/2017	1	1
14/10/2016	3	20	02/12/2016	6	390	29/03/2017	1	1
14/10/2016	6	30	02/12/2016	5	2	30/03/2017	1	6
14/10/2016	6	2	09/12/2016		4	30/03/2017	1	1
14/10/2016	4	20	09/12/2016	3	8	30/03/2017	1	2
14/10/2016	6	10	09/12/2016	3	130	05/04/2017	1	280
21/10/2016	3	77	13/12/2016	1	1	05/04/2017	1	4
21/10/2016	3	257	13/12/2016	1	0	05/04/2017	1	1
21/10/2016	3	8	13/12/2016	1	1	11/04/2017	6	20
21/10/2016	6	240	13/12/2016	1	1	18/04/2017	4	2
21/10/2016	6	97	13/12/2016	1	1	18/04/2017	4	1
21/10/2016	6	92	13/12/2016	2	0	18/04/2017	4	2
28/10/2016	3	250	13/12/2016	2	9	19/04/2017	1	3
28/10/2016	3	10	14/12/2016	5	1	19/04/2017	1	1
28/10/2016	3	63	14/12/2016	5	1	19/04/2017	1	1
28/10/2016	4	55	15/12/2016	3	0	19/04/2017	1	3
28/10/2016	4	31	15/12/2016	3	1	27/04/2017	1	2
11/11/2016	1	90	15/12/2016	3	34	27/04/2017	2	35
11/11/2016	6	120	18/01/2017	3	45			
11/11/2016	3	20	20/01/2017	6	600			

Table B- 6: Lapwing ground records (2017-2018)

Date	Survey Area	Number of birds		Date	Survey Area	Number of birds
19/09/2017	4	26		05/12/2017	6	668
19/09/2017	4	9		18/12/2017	4	3
19/09/2017	6	44		18/12/2017	6	1
19/09/2017	6	21		18/12/2017	6	200
20/09/2017	6	248		18/12/2017	6	193
21/09/2017	5	45		18/12/2017	6	200
22/09/2017	6	4		18/12/2017	6	20
26/09/2017	4	49		19/12/2017	5	200
26/09/2017	6	420		19/12/2017	6	350
27/09/2017	6	260		19/12/2017	6	600
27/09/2017	6	197		19/12/2017	6	103
27/09/2017	6	36		08/01/2018	2	50
27/09/2017	6	110		08/01/2018	5	1
27/09/2017	6	28		08/01/2018	5	5
03/10/2017	5	320		08/01/2018	6	3
05/10/2017	4	146		08/01/2018	6	14
05/10/2017	6	50		08/01/2018	6	2
05/10/2017	6	80		09/01/2018	3	1
11/10/2017	6	7		09/01/2018	3	250
12/10/2017	6	253		09/01/2018	3	5
17/10/2017	4	110		09/01/2018	3	9
17/10/2017	4	60		09/01/2018	3	34
17/10/2017	4	60		09/01/2018	6	38
17/10/2017	6	23		09/01/2018	6	68
17/10/2017	6	130		09/01/2018	6	130
18/10/2017	6	20		09/01/2018	6	250
18/10/2017	6	15		22/01/2018	2	20
18/10/2017	6	21		22/01/2018	6	700
25/10/2017	6	189		22/01/2018	2	20
26/10/2017	6	222		23/01/2018	4	82
26/10/2017	6	287		23/01/2018	6	400
26/10/2017	6	57		05/02/2018	1	350
31/10/2017	6	91		05/02/2018	6	200
01/11/2017	6	60		05/02/2018	6	2
02/11/2017	5	7		06/02/2018	5	3
14/11/2017	6	37		06/02/2018	6	27
14/11/2017	6	64		06/02/2018	6	40
14/11/2017	6	615		06/02/2018	6	110
15/11/2017	6	77		19/02/2018	6	12
15/11/2017	6	1		20/02/2018	6	308
16/11/2017	4	2		20/02/2018	6	600
16/11/2017	4	1		20/02/2018	6	120
16/11/2017	4	1		20/02/2018	6	80
16/11/2017	4	11		08/03/2018	6	40
16/11/2017	6	225		13/03/2018	6	30
16/11/2017	6	3		26/03/2018	6	3
29/11/2017	2	4		05/04/2018	1	1
04/12/2017	6	83		11/04/2018	1	2
04/12/2017	6	200		17/04/2018	1	1
05/12/2017	5	15		26/04/2018	2	1
05/12/2017	6	500		26/04/2018	4	1

Table B- 7: Little egret ground records (2016-2017)

Date	Survey Area	Number of birds
23/09/2016	3	5
23/09/2016	6	1
23/09/2016	4	1
23/09/2016	4	9
30/09/2016	6	11
07/10/2016	3	1
21/10/2016	3	1
28/10/2016	6	3
11/11/2016	6	2
11/11/2016	3	2
11/11/2016	4	1
17/11/2016	6	1
17/11/2016	6	1
17/11/2016	4	1
25/11/2016	6	1
25/11/2016	6	1
13/12/2016	2	7
14/12/2016	5	1
14/12/2016	5	2
20/01/2017	4	1
20/01/2017	6	1
20/01/2017	5	1
17/2/2017	4	1
17/2/2017	4	1
01/03/2017	5	5
01/03/2017	4	3
01/03/2017	6	1
02/03/2017	2	1
03/03/2017	1	1
17/3/2017	5	3
17/3/2017	5	1
17/3/2017	5	3
20/3/2017	6	1
21/3/2017	3	1
21/3/2017	5	1
22/3/2017	5	2
22/3/2017	1	1
28/3/2017	4	1
28/3/2017	5	1
04/4/2017	4	1
04/4/2017	6	1
05/4/2017	1	2
05/4/2017	5	1
05/4/2017	5	1
05/4/2017	5	3
11/4/2017	3	1
11/4/2017	5	1
11/4/2017	5	1
18/4/2017	4	2
18/4/2017	5	2
28/4/2017	5	1

Table B- 8: Little egret ground records (2017-2018)

Date	Survey Area	Number of birds
19/09/2017	4	7
22/09/2017	6	1
26/09/2017	6	9
27/09/2017	6	1
04/10/2017	6	9
05/10/2017	6	1
10/10/2017	5	1
11/10/2017	3	1
12/10/2017	6	1
18/10/2017	6	2
24/10/2017	5	2
24/10/2017	5	3
24/10/2017	5	1
25/10/2017	6	1
31/10/2017	6	1
31/10/2017	6	1
14/11/2017	6	1
15/11/2017	6	1
15/11/2017	6	1
15/11/2017	6	2
16/11/2017	6	2
16/11/2017	6	1
29/11/2017	5	3
29/11/2017	5	3
29/11/2017	5	2
04/12/2017	5	3
05/12/2017	4	1
05/12/2017	5	2
05/12/2017	6	1
05/12/2017	6	1
05/12/2017	6	5
18/12/2017	6	1
18/12/2017	6	1
19/12/2017	4	1
19/12/2017	5	1
09/01/2018	3	8
22/01/2018	6	3
23/01/2018	5	1
05/02/2018	2	1
20/02/2018	4	2
20/02/2018	5	2
20/02/2018	6	1
21/02/2018	2	2
07/03/2018	2	1
08/03/2018	1	1
12/03/2018	5	1
13/03/2018	2	1
19/03/2018	6	1
20/03/2018	5	1
26/03/2018	6	1
26/03/2018	6	1
05/04/2018	6	1
05/04/2018	6	1
06/04/2018	6	1
10/04/2018	6	1
10/04/2018	6	1
16/04/2018	6	1
16/04/2018	6	3
27/04/2018	6	1

ANNEX C – Breeding Bird Survey Results (qualifying species)

Table C-1: Herring gull ground records (2017)

Date	Area	Number of birds
05/04/2017	6	3
05/04/2017	6	2
05/04/2017	5	9
05/04/2017	4	2
05/04/2017	4	1
06/04/2017	5	1
06/04/2017	5	1
06/04/2017	6	13
12/04/2017	1	2
12/04/2017	1	1
09/05/2017	4	3
09/05/2017	4	1
09/05/2017	6	1
09/05/2017	6	2
09/05/2017	4	1
14/06/2017	3	1

Table C-2: Lesser black-backed gull ground records (2017)

Date	Area	Number of birds
05/04/2017	Area 4	3
05/04/2017	Area 6	1
05/04/2017	Area 6	3
06/04/2017	Area 5	2
06/04/2017	Area 6	7
02/05/2017	Area 2	3
02/05/2017	Area 3	2
09/05/2017	Area 5	5
09/05/2017	Area 6	2
09/05/2017	Area 6	4
09/05/2017	Area 6	1
09/05/2017	Area 6	2
13/06/2017	Area 4	1
13/06/2017	Area 4	11
13/06/2017	Area 4	22
13/06/2017	Area 4	1
13/06/2017	Area 4	2

Date	Area	Number of birds
13/06/2017	Area 5	3
14/06/2017	Area 3	9

APPENDIX 4 - The Planning Inspectorate Matrices

The Planning Inspectorate

Advice Note 10

Habitats Regulations Assessment

Screening Matrices

Potential Effects

Potential effects upon the European site(s)* which are considered within the submitted HRA Report (HRA Report (document reference TR010035/APP/5.4 – Rev 2)) are provided in the table below. Impacts have been grouped where appropriate for ease of presentation.

Effects considered within the screening matrices

Designation	Effects described in submission information	Presented in screening matrices as
Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site	• Disturbance/displacement of SPA/Ramsar site species utilising fields within and adjacent to the Scheme, from noise and visual effects associated with the construction works	• Disturbance/displacement
	• Loss of foraging and roosting habitat used by SPA/Ramsar site species within and adjacent to the Scheme	• Loss of habitat
	• Air pollution from construction traffic and machinery • Dust from construction traffic and machinery	• Air pollution
	• Negative effects on water quality on the River Wyre and its associated tributaries, due to receipt of construction site runoff and potential for reduced flow conveyance capacity	• Change in water quality
Morecambe Bay SAC	• Degradation of qualifying features as a result of the Scheme	• Habitat loss/alteration
	• Air pollution from construction traffic and machinery • Dust from construction traffic and machinery	• Air pollution

* As defined in Advice Note 10.

Designation	Effects described in submission information	Presented in screening matrices as
	• Negative effects on water quality as a result of construction works	• Change in water quality
Ribble and Alt Estuaries SPA and Ramsar site	• Disturbance/displacement of SPA/Ramsar site species utilising fields within and adjacent to the Scheme, from noise and visual effects associated with the construction works	• Disturbance/displacement
	• Loss of foraging and roosting habitat used by SPA/Ramsar site species within and adjacent to the Scheme	• Loss of habitat
Liverpool Bay SPA	• Disturbance/displacement of SPA species from construction works	• Disturbance/displacement
Shell Flat and Lune Deep SAC	• Disturbance/displacement of SPA species from construction works	• Disturbance/displacement

STAGE 1: SCREENING MATRICES

The European sites included within the screening assessment are:

Morecambe Bay and Duddon Estuary SPA

Morecambe Bay Ramsar site

Morecambe Bay SAC

Ribble and Alt Estuaries SPA

Ribble and Alt Estuaries Ramsar site

Liverpool Bay SPA

Shell Flat and Lune Deep SAC

Evidence for, or against, likely significant effects on the European site(s) and its qualifying feature(s) is detailed within the footnotes to the screening matrices below.

Matrix Key:

✓ = Likely significant effect **cannot** be excluded
✗ = Likely significant effect **can** be excluded

C = construction
O = operation
D = decommissioning

= Effect not relevant to feature

HRA Screening Matrix 1: Morecambe Bay and Duddon Estuary SPA

Name of European site and designation: Morecambe Bay and Duddon Estuary SPA															
EU Code: UK9020326															
Distance to NSIP 0.3km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Air pollution*			*Change in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Article 4.1 - Breeding															
Little tern	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Sandwich tern	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Common tern	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Article 4.1 - Wintering															
Whooper swan	**×b**	**×b**		**×b**	**×b**		**×e**	**×e**		**×f**	**×f**		**×g**	**×g**	
Little egret	**✓d**	**✓d**		**✓d**	**✓d**		**×e**	**×e**		**×f**	**×f**		**×g**	**×g**	
Golden plover	**×b**	**×b**		**×b**	**×b**		**×e**	**×e**		**×f**	**×f**		**×g**	**×g**	
Bar-tailed godwit	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Ruff	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Mediterranean gull	**×b**	**×b**		**×b**	**×b**		**×e**	**×e**		**×f**	**×f**		**×g**	**×g**	
Article 4.2 - Breeding															
Lesser black-backed gull	**×c**	**×c**		**×c**	**×c**		**×e**	**×e**		**×f**	**×f**		**×g**	**×g**	
Herring gull	**×b**	**×b**		**×b**	**×b**		**×e**	**×e**		**×f**	**×f**		**×g**	**×g**	
Article 4.2 - Wintering															

Name of European site and designation: Morecambe Bay and Duddon Estuary SPA															
EU Code: UK9020326															
Distance to NSIP 0.3km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Air pollution*			*Change in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Pink-footed goose	**✓d**	**✓d**		**✓d**	**✓d**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Shelduck	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Pintail	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Oystercatcher	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Grey plover	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Ringed plover	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Curlew	**✓d**	**✓d**		**✓d**	**✓d**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Black-tailed godwit	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Turnstone	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Knot	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Sanderling	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Dunlin	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Redshank	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Lesser black-backed gull	**×c**	**×c**		**×c**	**×c**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Internationally important waterbird assemblage of	**×e**	**×e**		**×e**	**×e**		**×e**	**×e**		**✓g**	**×h**		**×i**	**×i**	

Name of European site and designation: Morecambe Bay and Duddon Estuary SPA															
EU Code: UK9020326															
Distance to NSIP 0.3km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Air pollution*			*Change in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
over 20,000 individuals															
Internationally important seabird population of over 20,000 individuals	**×e**	**×e**		**×e**	**×e**		**×e**	**×e**		**✓g**	**×h**		**×i**	**×i**	

Evidence supporting conclusions:

a. Species not recorded within the Bird Survey Area (HRA Report, Appendix 3, (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on this species as a result of this potential impact.

b. Species recorded within the Bird Survey Area, but no records of more than 1% of the Morecambe Bay and Duddon Estuary SPA population recorded within the Bird Survey Area (HRA Report, Appendix 3, (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on this species as a result of this potential impact.

c. Species recorded within the Bird Survey Area. Records of more than 1% of the Morecambe Bay and Duddon Estuary SPA population observed. However, all records of more than 1% of the SPA population more than 300m from the edge of the construction works (HRA Report, Section 6.6 (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on this species as a result of this potential impact.

d. Species recorded within the Bird Survey Area. Records of more than 1% of the Morecambe Bay and Duddon Estuary SPA population recorded within 300m of the edge of the construction works (HRA Report, Section 6.6 (document reference

TR010035/APP/5.4 – Rev 2)). Potential for likely significant effect cannot be ruled out. Further Appropriate Assessment required of this species.

e. The majority of birds which would constitute the seabird assemblage are associated with marine and coastal habitats to the north of the Scheme. (HRA Report, Section 6.6 (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on the assemblage as a result of this potential impact.

f. Air quality assessment determined no likely significant effect on Morecambe Bay and Duddon Estuary SPA as a result of the construction or operational phases of the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 6: Air Quality (document reference TR010035/APP/6.6)).

g. Water quality assessment determined potential for likely significant effect on water quality as a result of the construction phase cannot be ruled out. Further Appropriate Assessment required of this impact (HRA Report, Section 6.8 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12)).

h. Water quality assessment determined no likely significant effect on the SPA as a result of the operational phases of the Scheme (HRA Report, Section 6.8 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12).

i. Potential effects of the Scheme have been identified as temporary during construction; any in-combination effects would, therefore, not be significant in the long term (HRA Report, Section 6.10 and 7.5 (document reference TR010035/APP/5.4 – Rev 2).

a. HRA Screening Matrix 2: Morecambe Bay Ramsar site

Name of European site and designation: Morecambe Bay Ramsar site															
EU Code: UK11045															
Distance to NSIP 0.3km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Ramsar criterion 4 - Passage															
Ringed plover	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**×g**	**×h**		**×i**	**×i**	
Ramsar criterion 5 - Assemblage															
Species with peak counts in winter: 223,709 waterfowl (5 year peak mean 1998/99-2002/2003)	**×e**	**×e**		**×e**	**×e**		**×f**	**×f**		**×g**	**×h**		**×i**	**×i**	
Ramsar criterion 6 - Species regularly supported during the breeding season															
Sandwich tern	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Lesser black-backed gull	**×c**	**×c**		**×c**	**×c**		**×f**	**×f**		**×g**	**×h**		**×i**	**×i**	
Herring gull	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**×g**	**×h**		**×i**	**×i**	
Ramsar criterion 6 - Species with a peak Spring/Autumn															
Great Cormorant	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**×g**	**×h**		**×i**	**×i**	
Shelduck	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**×g**	**×h**		**×i**	**×i**	

Name of European site and designation: Morecambe Bay Ramsar site															
EU Code: UK11045															
Distance to NSIP 0.3km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Pintail	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Eider	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Oystercatcher	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Ringed plover	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Grey plover	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Sanderling	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Curlew	**✓d**	**✓d**		**✓d**	**✓d**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Redshank	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Turnstone	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Lesser black-backed gull	**×c**	**×c**		**×c**	**×c**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Ramsar criterion 6 - Species with a peak counts in winter															
Great crested grebe	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	
Pink-footed goose	**✓d**	**✓d**		**✓d**	**✓d**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Wigeon	**×c**	**×c**		**×c**	**×c**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Goldeneye	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Red-breasted merganser	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	

Name of European site and designation: Morecambe Bay Ramsar site															
EU Code: UK11045															
Distance to NSIP 0.3km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Golden plover	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Lapwing	**✓d**	**✓d**		**✓d**	**✓d**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Knott	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Dunlin	**×b**	**×b**		**×b**	**×b**		**×f**	**×f**		**✓g**	**×h**		**×i**	**×i**	
Bar-tailed godwit	**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**		**×a**	**×a**	

Evidence supporting conclusions:

a. Species not recorded within the Bird Survey Area (HRA Report, Appendix 3, (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on this species as a result of this potential impact.

b. Species recorded within the Bird Survey Area, but no records of more than 1% of the Morecambe Bay Ramsar site population recorded within the Bird Survey Area (HRA Report, Appendix 3, (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on this species as a result of this potential impact.

c. Species recorded within the Bird Survey Area. Records of more than 1% of the Morecambe Bay Ramsar site population observed. However, all records of more than 1% of the Ramsar site population more than 300m from the edge of the construction works (HRA Report, Section 6.6 (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on this species as a result of this potential impact.

d. Species recorded within the Bird Survey Area. Records of more than 1% of the Morecambe Bay Ramsar site population recorded within 300m of the edge of the construction works (HRA Report, Section 6.6 (document reference

TR010035/APP/5.4 – Rev 2)). Potential for likely significant effect cannot be ruled out. Further Appropriate Assessment required of this species.

e. Less than 1% of the Morecambe Bay Ramsar site assemblage population recorded within 300m from the edge of the construction works. (HRA Report, Section 6.6 (document reference TR010035/APP/5.4 – Rev 2)). There would be no likely significant effect on the assemblage as a result of this potential impact.

f. Air quality assessment determined no likely significant effect on Morecambe Bay Ramsar site as a result of the construction or operational phases of the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 6: Air Quality (document reference TR010035/APP/6.6)).

g. Water quality assessment determined potential for likely significant effect on water quality during the construction phase cannot be ruled out. Further Appropriate Assessment required of this impact (HRA Report, Section 6.8 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12)).

h. Water quality assessment determined no likely significant effect on the SPA as a result of the operational phases of the Scheme (HRA Report, Section 6.8 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12).

i. Potential effects of the Scheme have been identified as temporary during construction; any in-combination effects would, therefore, not be significant in the long term (HRA Report, Section 6.10 and 7.5 (document reference TR010035/APP/5.4 – Rev 2)).

HRA Screening Matrix 3: Morecambe Bay SAC

Name of European site and designation: Morecambe Bay SAC												
EU Code: UK0013027												
Distance to NSIP 8km												
European site features	**Adverse effect on integrity**											
Effect	*Habitat loss/alteration*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Annex I habitats that are a primary reason for selection of this site												
1130 Estuaries	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
1140 Mudflats and sandflats not covered by seawater at low tide	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
1160 Large shallow inlets and bays	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
1220 Perennial vegetation of stony banks	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
1310 Salicornia and other annuals colonizing mud and sand	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	

Name of European site and designation: Morecambe Bay SAC												
EU Code: UK0013027												
Distance to NSIP 8km												
European site features	**Adverse effect on integrity**											
Effect	*Habitat loss/alteration*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
2120 "Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
2130 "Fixed coastal dunes with herbaceous vegetation (""grey dunes"")"	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
2190 Humid dune slacks	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site												

Name of European site and designation: Morecambe Bay SAC												
EU Code: UK0013027												
Distance to NSIP 8km												
European site features	**Adverse effect on integrity**											
Effect	*Habitat loss/alteration*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
1110 Sandbanks which are slightly covered by sea water all the time	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
1150 Coastal lagoons	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
1170 Reefs	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
2110 Embryonic shifting dunes	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
2150 Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
2170 Dunes with Salix repens ssp. argentea (*Salicion arenariae*)	**×a**	**×a**		**×b**	**×b**		**×c**	**×c**		**×e**	**×e**	
Annex II species that are a primary reason for selection of this site												

Name of European site and designation: Morecambe Bay SAC												
EU Code: UK0013027												
Distance to NSIP 8km												
European site features	**Adverse effect on integrity**											
Effect	*Habitat loss/alteration*			*Air pollution*			*Changes in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
1166 Great crested newt *Triturus cristatus*	**×d**	**×d**										

Evidence supporting conclusions:

- **a.** Qualifying habitats associated with the SAC located more than 8km from the Scheme. There would be no habitat loss/alteration of the qualifying habitats as a result of the Scheme. (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)).
- **b.** Air quality assessment determined no likely significant effect on the SAC as a result of the construction or operational phases of the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 6: Air Quality (document reference TR010035/APP/6.6)).
- **c.** Water quality assessment determined no likely significant effect on the SAC as a result of the construction or operational phases of the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2) and Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.6))
- **d.** Although great crested newts have been identified within the Scheme, the population of great crested newts associated with the SAC are located on the southern shore of the Duddon Estuary (more than 30km from the Scheme) and would not be affected by the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)).
- **e.** No in combination effects identified. (HRA Report, Section 6.10 and 7.5 (document reference TR010035/APP/5.4 – Rev 2)).

HRA Screening Matrix 4: Ribble and Alt Estuaries SPA

Name of European site and designation: Ribble and Alt Estuaries SPA															
EU Code: UK9005103															
Distance to NSIP 10km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Article 4.1 - Breeding															
Common tern	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Ruff	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Article 4.1 – Wintering															
Bar-tailed godwit	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Bewick's swan	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Golden plover	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Whooper swan	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Article 4.2 – Breeding															
Lesser black-backed gull	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Article 4.2 – Passage															
Ringed plover	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Sanderling	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Article 4.2 - Wintering															
Black-tailed godwit	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	

Name of European site and designation: Ribble and Alt Estuaries SPA															
EU Code: UK9005103															
Distance to NSIP 10km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Dunlin	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Grey plover	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Knot	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Oystercatcher	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Pink-footed goose	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Pintail	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Redshank	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Sanderling	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Shelduck	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Teal	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Wigeon	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Article 4.2 Assemblage															
Regularly supporting at least 20,000 seabirds during the breeding season	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	

Name of European site and designation: Ribble and Alt Estuaries SPA															
EU Code: UK9005103															
Distance to NSIP 10km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Regularly supporting at least 20,000 waterfowl during the winter	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	

Evidence supporting conclusions:

- **a.** Species not recorded within the Bird Survey Area (HRA Report, Appendix 3, (document reference TR010035/APP/5.4 – Rev 2)).
- **b.** The Ribble and Alt Estuaries SPA is 10km from the Scheme. It was agreed with Natural England that, providing there are no impacts from the Scheme which lead to an effect upon the integrity of the Morecambe Bay and Duddon Estuary SPA (JNCC, 2017) and Morecambe Bay Ramsar site (JNCC, 2017), it will inevitably confirm that potential impacts associated with the Ribble and Alt Estuaries SPA and Ramsar site would also not be significant or affect the integrity of the sites. The Appropriate Assessment of the Scheme determined that there would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site as a result of the construction phase (with mitigation in place). Therefore, potential effects on the Ribble and Alt Estuaries SPA during the construction phase can be ruled out. (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)
- **c.** The Ribble and Alt Estuaries SPA is 10km from the Scheme. It was agreed with Natural England that, providing there are no impacts from the Scheme which lead to an effect upon the integrity of the Morecambe Bay and Duddon Estuary SPA

(JNCC, 2017) and Morecambe Bay Ramsar site (JNCC, 2017), it will inevitably confirm that potential impacts associated with the Ribble and Alt Estuaries SPA and Ramsar site would also not be significant or affect the integrity of the sites. The Appropriate Assessment of the Scheme determined that there would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site as a result of the operational phase. Therefore, potential effects on the Ribble and Alt Estuaries SPA during the operational phase can be ruled out. (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)

d. No in combination effects identified. (HRA Report, Section 6.10 and 7.5 (document reference TR010035/APP/5.4 – Rev 2)

HRA Screening Matrix 5: Ribble and Alt Estuaries Ramsar site

Name of European site and designation: Ribble and Alt Estuaries Ramsar site															
EU Code: UK11057															
Distance to NSIP 10km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Ramsar criterion 2															
Natterjack toad	**×e**	**×e**		**×e**	**×e**								**×e**	**×e**	
Ramsar criterion 5															
Assemblage of international importance during the winter (222,038 birds)	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Ramsar criterion 6 – Species regularly supported during the breeding season															
Lesser black-backed gull	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Ramsar criterion 6 – Species with peak counts in Spring/Autumn															
Ringed plover	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Grey plover	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Knot	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Sanderling	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Dunlin	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	

Name of European site and designation: Ribble and Alt Estuaries Ramsar site															
EU Code: UK11057															
Distance to NSIP 10km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Loss of habitat*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Black-tailed godwit	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Redshank	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Lesser black-backed gull	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Ramsar criterion 6 – Species with peak counts in Winter															
Bewick's swan	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	
Whooper swan	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Pink-footed goose	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Shelduck	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Wigeon	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Teal	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Pintail	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Oystercatcher	**×b**	**×c**		**×b**	**×c**								**×d**	**×d**	
Bar-tailed godwit	**×a**	**×a**		**×a**	**×a**								**×a**	**×a**	

Evidence supporting conclusions:

a. Species not recorded within the Bird Survey Area (HRA Report, Appendix 3, (document reference TR010035/APP/5.4))

b. The Ribble and Alt Estuaries Ramsar site is 10km from the Scheme. It was agreed with Natural England that, providing there are no impacts from the Scheme which lead to an effect upon the integrity of the Morecambe Bay and Duddon

Estuary SPA (JNCC, 2017) and Morecambe Bay Ramsar site (JNCC, 2017), it will inevitably confirm that potential impacts associated with the Ribble and Alt Estuaries SPA and Ramsar site would also not be significant or affect the integrity of the sites. The Appropriate Assessment of the Scheme determined that there would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA/Morecambe Bay Ramsar site as a result of the construction phase (with mitigation in place). Therefore, potential effects on the Ribble and Alt Estuaries SPA during the construction phase can be ruled out. (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)

c. The Ribble and Alt Estuaries Ramsar site is 10km from the Scheme. It was agreed with Natural England that, providing there are no impacts from the Scheme which lead to an effect upon the integrity of the Morecambe Bay and Duddon Estuary SPA (JNCC, 2017) and Morecambe Bay Ramsar site (JNCC, 2017), it will inevitably confirm that potential impacts associated with the Ribble and Alt Estuaries SPA and Ramsar site would also not be significant or affect the integrity of the sites. The Appropriate Assessment of the Scheme determined that there would be no adverse effect on the integrity of Morecambe Bay and Duddon Estuary SPA/Morecambe Bay SPA as a result of the operational phase. Therefore, potential effects on the Ribble and Alt Estuaries SPA during the operational phase can be ruled out. (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)

d. No in combination effects identified. (HRA Report, Section 6.10 and 7.5 (document reference TR010035/APP/5.4– Rev 2)

e. The population of natterjack toad associated with the Ramsar site are located more than 10km from the construction works and would not be affected by the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2)

HRA Screening Matrix 6: Liverpool Bay SPA

Name of European site and designation: Liverpool Bay SPA															
EU Code: UK9020294															
Distance to NSIP 6km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Effect 2*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Annex 1 – Wintering															
Red-throated diver	**×a**	**×a**													
Little gull	**×a**	**×a**													
Common scoter	**×a**	**×a**													
Annex 1 – Breeding															
Little tern	**×a**	**×a**													
Common tern	**×a**	**×a**													
Assemblage															
Internationally important waterfowl assemblage	**×a**	**×a**													

Evidence supporting conclusions:

a. Qualifying species associated with the SPA forage exclusively at sea or around coastal areas. There would be no likely significant effects on the qualifying species associated with the SPA as a result of the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2))

HRA Screening Matrix 6: Shell Flat and Lune Deep SAC

Name of European site and designation: Shell Flat and Lune Deep SAC															
EU Code: UK0030376															
Distance to NSIP 9km															
European site features	**Likely effects of NSIP**														
Effect	*Disturbance/ displacement*			*Effect 2*			*Effect 3*			*Effect 4*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Annex I habitats that are a primary reason for selection of this site															
1110 Sandbanks which are slightly covered by sea water all the time	**×a**	**×a**													
1170 Reefs	**×a**	**×a**													

Evidence supporting conclusions:

a. Qualifying habitats associated with the SAC located more than 9km from the Scheme. There would be no likely significant effects on the qualifying habitats associated with the SAC as a result of the Scheme (HRA Report, Section 6.3 (document reference TR010035/APP/5.4 – Rev 2))

The Planning Inspectorate

Advice Note 10

Habitats Regulations Assessment

Integrity Matrices

STAGE 2: EFFECTS ON INTEGRITY

The table below shows the potential impacts on the European sites which are considered within the submitted HRA Report (HRA Report, Table 14 (document reference TR010035/APP/5.4 – Rev 2)).

Potential impact	Feature	Construction	Operation
Disturbance/ displacement	Pink-footed goose Curlew Lapwing Little egret Waterbird assemblage of the SPA/Ramsar site	Disturbance to birds using within and adjacent to the construction works (including construction traffic, noise and visual effects)	Disturbance to birds using land adjacent to the operational road (including noise and visual effects)
Loss of foraging/ roosting habitat	Pink-footed goose Curlew Lapwing Little egret	Direct loss of foraging/ roosting habitat under the footprint of the construction works (temporary)	Direct loss of foraging/ roosting habitat under the footprint of the construction works (permanent)
Change in water quality	Waterbird assemblage of the SPA/Ramsar site	Change in water quality downstream of the Main Dyke and its tributaries as a result of construction works	Screened out

Likely significant effects have been identified for the following sites:

Morecambe Bay and Duddon Estuary SPA
Morecambe Bay Ramsar site

These sites have been subject to further assessment in order to establish if the NSIP could have an adverse effect on their integrity. Evidence for the conclusions reached on integrity is detailed within the footnotes to the matrices below.

Matrix Key

✓ **=** Adverse effect on integrity **cannot** be excluded
× **=** Adverse effect on integrity **can** be excluded

C = construction
O = operation
D = decommissioning

= Effect not relevant to feature

HRA Integrity Matrix 1: Morecambe Bay and Duddon Estuary SPA

Name of European site and designation: Morecambe Bay and Duddon Estuary SPA												
EU Code: UK9020326												
Distance to NSIP 0.3km												
European site features	**Adverse effect on integrity**											
Effect	*Disturbance/ displacement*			*Loss of foraging/ roosting habitat*			*Change in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Article 4.2 - Wintering												
Pink-footed goose	**×a**	**×c**		**×d**	**×f**					**×h**	**×h**	
Curlew	**×a**	**×c**		**×d**	**×f**					**×h**	**×h**	
Internationally important water-bird assemblage of over 20,000 individuals	**xd**	**xc**					**×g**	**×g**		**×h**	**×h**	
Article 4.1 - Wintering												
Little egret	**×b**	**×c**		**×e**	**×f**					**×h**	**×h**	

Evidence supporting conclusions

a. The potential short-term disturbance/displacement effect from the construction works is unlikely to be detrimental to the fulfilment of the conservation objectives for the SPA/Ramsar site in relation to pink-footed geese and curlew; however, such effects cannot be ruled out, therefore mitigation measures will be put in place to provide an alternative foraging/ roosting area for these birds for the duration of the construction work in order to ensure no adverse effect on integrity of the European site during the construction phase (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4 – Rev 2)).

b. The potential short-term disturbance/displacement effect from the construction works would not have any adverse effects on the integrity of the SPA population of little egret, or the overwintering waterbird assemblage. No specific mitigation for little egret or the overwintering waterbird assemblage is proposed. However, the mitigation measures put in place for curlew and lapwing (including the provision of scrapes), would provide suitable alternative foraging habitat for other species, should they wish to use it during the construction phase (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4 – Rev 2)).

c. The potential long-term disturbance/displacement effect from the completed Scheme would not have any adverse effects the integrity of the SPA populations of pink-footed geese, curlew, little egret and the overwintering waterbird assemblage. Measures in place to reduce noise and visual disturbance/displacement from the completed Scheme. Results of the traffic forecasting and noise assessments show a decrease in noise levels within the River Wyre (where the majority of SPA bird species have been recorded). Therefore, no mitigation is required for potential displacement/ disturbance to pink-footed geese, curlew, little egret and the overwintering waterbird assemblage during the operational phase. [The Scheme could potentially have some net beneficial effects through the decrease in noise levels within the River Wyre which falls within the SPA] (HRA Report, Section 7.7 (document reference TR010035/APP/5.4 – Rev 2)).

d. The habitat loss associated with the construction phase of the Scheme (5ha) would not significantly reduce the available foraging/roosting habitat for pink-footed geese and curlew associated with the SPA. Specific mitigation for loss of habitat is therefore not proposed. However, the mitigation measures put in place for disturbance/displacement during the construction phase of the Scheme, would provide suitable alternative foraging habitat for pink-footed geese and curlew should they wish to use it during the construction phase (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4 – Rev 2)).

e. The majority of the permanent wetland features (such as Main Dyke) observed to be used by little egret during the bird surveys would not be directly affected by the Scheme. Although, a number of field ditches would be affected due to the requirement to culvert ditches that pass under the Scheme, only very small sections would be effectively lost during the construction period. No specific mitigation for little egret is proposed. However, the mitigation measures put in place for

curlew and lapwing (including the provision of scrapes), would provide suitable alternative foraging habitat for this species, should they wish to use it during the construction phase (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4 – Rev 2)).

f. The habitat loss associated with the operational phase of the Scheme would not significantly reduce the available foraging/roosting habitat for pink-footed geese, curlew and little egret associated with the SPA. Specific mitigation for loss of habitat is therefore not proposed (HRA Report, Section 7.7 (document reference TR010035/APP/5.4 – Rev 2)).

g. Whilst the embedded mitigation measures to protect water quality across the construction site would be sufficient to avoid adverse impacts on Morecambe Bay and Duddon Estuary SPA, additional mitigation measures will be required to protect water quality during the construction phase, particularly at the new bridge crossing of the Main Dyke which flows directly into the River Wyre (HRA Report, Section 7.4 (document reference TR010035/APP/5.4 – Rev 2)).

h. Potential effects of the Scheme have been identified as temporary during construction; any in-combination effects would, therefore, not be significant in the long term (HRA Report, Section 6.10, 6.11 and 7.5 (document reference TR010035/APP/5.4 – Rev 2)).

HRA Integrity Matrix 2: Morecambe Bay Ramsar site

Name of European site and designation: Morecambe Bay Ramsar site												
EU Code: UK11045												
Distance to NSIP 0.3km												
European site features	**Adverse effect on integrity**											
Effect	*Disturbance/ displacement*			*Loss of foraging/ roosting habitat*			*Change in water quality*			*In combination effects*		
Stage of Development	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*	*C*	*O*	*D*
Ramsar criterion 6 - Species with a peak counts in winter												
Pink-footed goose	**×a**	**×b**		**×c**	**×d**					**×f**	**×f**	
Lapwing	**×a**	**×b**		**×c**	**×d**					**×f**	**×f**	
Ramsar criterion 5 - Assemblage												
Species with peak counts in winter: 223,709 waterfowl (5 year peak mean 1998/99-2002/2003)		**xb**					**×e**	**×e**		**×f**	**×f**	

Evidence supporting conclusions

- **a.** The potential short-term disturbance/displacement effect from the construction works is unlikely to be detrimental to the fulfilment of the conservation objectives for the SPA/Ramsar site in relation to pink-footed geese and lapwing; however, such effects cannot be ruled out. Therefore mitigation measures will be put in place to provide an alternative foraging/ roosting area for these birds for the duration of the construction work in order to ensure no adverse effect on integrity of the European site during the construction phase (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4 – Rev 2)).
- **b.** The potential long-term disturbance/displacement effect from the completed Scheme would not have any adverse effects the integrity of the SPA populations of pink-footed geese, lapwing and the overwintering waterbird assemblage. Measures in place to reduce noise and visual disturbance/displacement from the completed Scheme. Results of the traffic forecasting and noise assessments show a decrease in noise levels within the River Wyre (where the majority of SPA bird species have been recorded). Therefore, no mitigation is required for potential displacement/disturbance to pink-footed geese, curlew and little egret during the operational phase. [The Scheme could potentially have some net beneficial effects through the decrease in noise levels within the River Wyre which falls within the SPA] (HRA Report, Section 7.7 (document reference TR010035/APP/5.4 – Rev 2)).
- **c.** The habitat loss associated with the construction phase of the Scheme (5ha) would not significantly reduce the available foraging/roosting habitat for pink-footed geese and lapwing associated with the Ramsar site. Specific mitigation for loss of habitat is therefore not proposed. However, the mitigation measures put in place for disturbance/displacement during the construction phase of the Scheme, would provide suitable alternative foraging habitat for pink-footed geese and lapwing should they wish to use it during the construction phase (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4– Rev 2)).
- **d.** The habitat loss associated with the operational phase of the Scheme would not significantly reduce the available foraging/roosting habitat for pink-footed geese and lapwing associated with the Ramsar site. Specific mitigation for loss of habitat is therefore not proposed (HRA Report, Section 7.7 (document reference TR010035/APP/5.4 – Rev 2)).
- **e.** Whilst the embedded mitigation measures to protect water quality across the construction site would be sufficient to avoid adverse impacts on Morecambe Bay Ramsar site, additional mitigation measures will be required to protect water quality during the construction phase at the new bridge crossing of the Main Dyke which flows directly into the River Wyre (HRA Report, Section 7.4 and 7.6 (document reference TR010035/APP/5.4 – Rev 2)).
- **f.** Potential effects of the Scheme have been identified as temporary during construction; any in-combination effects would, therefore, not be significant in the long term (HRA Report, Section 6.10, 6.11 and 7.5 (document reference TR010035/APP/5.4 – Rev 2)).

APPENDIX 5 - Natural England Consultation and The Planning Inspectorate Comments

Report Title: A585 Windy Harbour to Skippool Improvement Scheme Habitats Regulations Assessment

Doc Ref / date: 01/06/18

Reviewer: Natural England

Section/ paragraph	Page	Natural England Comment	Response
Contents page	-	Contents are duplicated	Contents page updated to remove the duplication
4.3.23	22	Liverpool Bay SPA & Shell Flat and Lune Deep SAC - The test in the Habs Regs is whether the plan or project will have a significant effect on the European site's interest features; it is not whether the plan/ project leads to any of the threats/ pressures detailed in the SIP. Whilst we agree that there will not be any significant impacts on these sites, the HRA needs to provide a correct audit trail as to the reasoning behind this conclusion. Therefore we would advise using distance, and the fact that the Liverpool Bay SPA species do not use the habitat in and around the road scheme.	Text updated to clarify the reasoning for screening Liverpool Bay SPA out of the assessment
4.3.25	22	As Liverpool Bay comment above	Text updated to clarify the reasoning for screening Shell Flat and Lune Deep SAC out of the assessment
4.5.2	24	Same comment as Liverpool Bay SPA above. The SIP can be used to inform the HRA, however it should not be relied upon. You should use the conservation objectives to determine how the proposal may (or may not) affect the designated site.	Text updated to clarify the reasoning for screening Morecambe Bay and Duddon Estuary SPA into the assessment
5.4.2	30	It's 1% or greater of the SPA population.	Text amended throughout the document to refer to '1% or greater' rather than 'more than 1%'
Table 8	32	As comment above, this should be 1% of the population or greater	As above, text amended throughout the document
5.6.1	35	This should be done at LSE stage ie. Impacts screened out as no LSE alone, now need to check whether they are LSE in-combination.	Text comment refers to deleted when the document was re-worked to combine the two screening sections. In combination effects dealt with within Sections 5.9, 5.10 and 6.8 of the HRA Report
6.1.1	36	There should only be one LSE screening assessment where you incorporate all the data into one screening assessment	Document has been re-worked to combine the two screening sections
6.3.5	38	To be clear, the impact on the waterbird assemblage should be assessed for each important species which form the assemblage ie. Assess teal against the whole site teal population, not against the whole SPA population of all birds.	Waterbird assemblage calculated as per NE email (dated 17th May 2018). Text amended to further clarify how the waterbird assemblage was calculated
Table 12	39	How was the data gathered to populate this table? Do the counts need to be amalgamated? i.e. if the survey work was done at the same time there are counts of teal = 30+28+62+12+93 = 225 and therefore nearly 6% of the Morecambe Bay teal population (although note WeBS doesn't have the new Morecambe Bay and Duddon Estuary SPA). It would not be appropriate to rule this impact out as the calculation has been undertaken against the whole waterbird assemblage (see comment above).	See comment above
Table 13	43	Need to add herring gull	Herring gull added to Table 13
7.3.4	48	The noise report should include the existing baseline and what the predicted noise levels will be (measured in LAeq and LAmax). We would also expect to see mitigation measures (e.g. acoustic hoarding) being built into the proposed development that would negate/ reduce noise impacts impact if required.	Noise modelling currently being undertaken for the Scheme. The results will be included in the next iteration of the HRA Report once the noise assessment has been completed. Acoustic hoarding has been incorporated into the Scheme design

Section/ paragraph	Page	Natural England Comment	Response
		As a rule of thumb we should consider that an increase of 3dB from baseline to predicted noise levels as a guide to significance.	
7.3.4	48	Natural England does not endorse the evidence provided in the IECS toolkit. We were involved in some previous work IECS did through the Humber INCA (now Humber Nature Partnership) several years ago. This involved a literature review which reported that there was little evidence available on the impacts of construction disturbance to birds. It is therefore unclear to Natural England how it was then possible to come up with very specific noise and distance 'triggers' for individual species of birds in this toolkit. We are not sure that you need to reference the ICES toolkit anyway because we agreed that you could use a 300m displacement buffer around the site.	Reference to the IECS toolkit has been removed from the document
7.4.9	56	The test at this stage of the Habs Regs Assessment is whether the proposal would affect the integrity of the SPA in light of the sites conservation objectives. There aren't different hierarchies of effect that need to be considered. The area within the 300m buffer supports significant counts of SPA birds, it is not relevant to the project if other areas support more or less birds because there is the potential that this project could affect the designated site and that's what the HRA should be assessing. We would also say that 15 significant counts of SPA birds during the survey period does demonstrate regular use (there are only 14 shown in the table; is one missing?). Given that we've agreed the 300m buffer and the work to ID the relevant spp within this buffer has been completed, it seems like an odd approach to conclude that there won't be any effect on the SPA. Also if mitigation is being included as an EIA measure, there is nothing additional required to resolve HRA issues. Given that there are significant numbers of 3 SPA spp within the 300m buffer, these are not low numbers (e.g. like the little egret), the total loss is 48ha and the construction period covers 2 winters, it's our advice that mitigation is required to avoid an adverse effect on site integrity	Text amended to include the need for precautionary mitigation during the construction phase to ensure no adverse effect on integrity of the European sites
7.4.13	57	We agree with the rationale that screens out little egret.	Noted
7.4.27	60	We would disagree with this statement – the 5ha referred to in this paragraph is direct loss (ie. Doesn't include areas that could be disturbed)	Text amended to clarify calculation of habitat loss
7.4.31	61	Additional work in required for Water Quality. WQ has been taken through to the AA and so the detailed mitigation measures are needed to demonstrate that they are sufficient to rule out adverse effect – i.e. provide the necessary level of certainty "*a competent authority must be certain – i.e. there is no reasonable scientific doubt - that the project will not have an adverse effect on integrity before giving consent*".	Water quality measures to be implemented are still being determined. Additional text will be added to the next iteration of the HRA to confirm the details of the water quality measures which will be implemented to protect water quality in the SPA/Ramsar site
7.4.37	62	If the field is used by SPA birds and construction works will occur within it, it is not appropriate to include a mitigation measure that states "where possible".	Text has been amended to clarify the timings of the works and any potential mitigation measures
7.5.3	62	Is this all spp species?	Yes. The reduction in noise levels in the vicinity of the River Wyre, as a result of de-trunking the A585, will have benefit to all SPA species which utilise the River Wyre and adjacent fields during the winter
7.5.4	63	The anticipated noise increases should be included here to provide context to the comments. This also needs to be considered with reference to the proposed planting as discussed on our call – ie. Is planting needed to reduce	Noise modelling currently being undertaken for the Scheme. The results will be included in the next iteration of the HRA once the noise assessment has been completed.

Section/ paragraph	Page	Natural England Comment	Response
		noise levels to birds in the surrounding fields or would it be preferable to leave the area as open as possible? This comment is also relevant to paragraph 8.2.2	A review of the landscape planting will be undertaken at the same time as the noise assessment
Table 21	63	Based on the current figures, we agree with your conclusion in 7.5.11 but we may need to update our advice if any of these figures increase	Noted
8.2.2	65	See comment on paragraph 7.5.4	See above
8.2.5	65	Our advice is that mitigation during construction is needed for the HRA.	Text amended to include the need for mitigation during the construction phase to ensure no adverse effect on integrity of the European sites
8.2.5	65	No further details included in section 9.	Reference corrected, further details provided in Table 22
Table 22	66	We agree with the principles of the mitigation measures – but, we reserve the right to comment on the full details of what will be provided.	Further details of the mitigation measures have been included within Section 6.5 of the HRA Report following receipt of the construction information and final road design. A separate Mitigation Strategy is also being developed for the mitigation area to the north of the Scheme
8.2.10	67	We agree that monitoring of the mitigation site will inform site management and will need to link to remedial measures where required. Who will be responsible for managing the habitat for the 2yrs?	Highways England will manage the land for the duration of the construction phase
9	68	We disagree with your conclusion of no adverse on integrity unless mitigation is provided.	Text amended to include the need for mitigation during the construction phase to ensure no adverse effect on integrity of the European sites

Report Title: A585 Windy Harbour to Skippool Improvement Scheme Habitats Regulations Assessment

Doc Ref / date: 16/08/18

Reviewer: The Planning Inspectorate

Point	Report para	Extract from Report	The Planning Inspectorate Question/ Comment	Response
1	n/a	n/a	Consultation with the Statutory Nature Conservation Body (SNCB) It is noted that Natural England (NE) has been consulted, with references to meetings and correspondence made throughout the HRA Report, and a summary of comments included in Appendix 5. A record of this engagement should be appended to the HRA Report and/or through cross reference to a signed Statement of Common Ground (SoCG), where available. This may reduce the need for the Examining Authority to ask questions in this regard.	A signed Statement of Common Ground will be produced, providing details of the consultation and agreements made with Natural England
2	2.5.9; 5.9; 6.8.2	"AWAITING COMFIRMATION OF FINAL LIST OF IN COMBINATION PLANS/PROJECTS" (para 2.5.9)	There are currently 18 in combination plans/projects identified in the HRA Report, but these are awaiting confirmation. Evidence of consultation and agreement with relevant consultation bodies (such as NE and the local authorities) on this point should be provided as per point 1 above.	In combination assessment has now been completed Agreement of the plans/projects included in the in combination assessment will be set out within the Statement of Common Ground
		"TO BE COMPLETED ONCE LIST OF OTHER PLANS/PROJECTS TO BE CONSIDERED HAS BEEN FINALISED" (5.9 – screening of in combination effects).	The Inspectorate notes the release of a new NE Guidance Note, Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. The Applicant should explain in the HRA report how they have taken this new guidance into account.	Reference to the new NE guidance is included within Section 5.11, of the HRA Report
		"Only the effects of other plans or projects which would not be likely to be significant alone, need to be included in the in-combination assessment. If the effects of other plans or projects would already be significant on their own, they are not added to those associated with the Scheme as they already have their own measures in place to mitigate for those effects" (para 6.8.2).	With reference to paragraph 6.8.2 of the draft HRA report, it should be explained further why a mitigated plan or project could not give rise to significant in-combination effects with the Proposed Development.	The in combination section of the HRA Report has now been completed and the text within paragraph 6.8.2 has been removed
3	3.3.5	"The farmland within and adjacent to the southern end of the Scheme is within the IRZ, and therefore has the potential to be functionally-linked to the Morecambe Bay and Duddon Estuary SPA/ Morecambe Bay Ramsar site".	It should be clear what value/importance has been attached to the potential functionally-linked land and this should be clearly identified on a plan (possibly link to Figure 7?).	Text within this section has been re-worked and this sentence has subsequently been removed
4	Table 7	n/a	Have the 2km and 10km study areas (30km where bats are noted as a qualifying interest), and the list of European sites identified in Table 7 in Chapter 5, been agreed with NE? Evidence of consultation and agreement by NE on this point should be provided as per point 1 above.	Agreement of these distances will be set out within the Statement of Common Ground

Point	Report para	Extract from Report	The Planning Inspectorate Question/ Comment	Response
5	5.2.1	"The location of the Scheme, in the context of nearby European sites, is shown on Figure 2, Appendix 1".	Figure 2, Appendix 1 illustrates the location of the Morecambe Bay Ramsar site and Morecambe Bay Duddon Estuary SPA. Suggest that the full extent of these sites, as well as the locations of the other European sites identified in Table 7, are also illustrated on figure/s in the HRA report.	Figure 2 has been amended to show all European sites shown in Table 7
6	5.3.3	"There are 16 potential pressures / threats which have been identified for these European sites within the Site Improvement Plan (SIP) for Morecambe Bay (Natural England, 2014). […] The potential pressures/ threats relevant to this assessment would comprise: air pollution, water pollution and changes in species distribution."	It is explained that 16 potential pressures/threats are identified in the Site Improvement Plan for Morecambe Bay, but only three have been considered "relevant to this assessment" (air pollution water pollution and changes in species distribution). It is not explained why the other pressures/threats were not considered relevant; the Applicant is advised that the HRA report should provide a clear justification to support this approach. (NB. This point applies throughout Chapter 5 where potential pressures/threats are discounted but justification is not provided). Evidence of consultation and agreement by NE on likely effects of the NSIP at each European site should be provided as per point 1 above.	Further clarification has been included in Chapter 5 to confirm why potential pressures/threats have been screened out of further assessment. Agreement of this will be set out within the Statement of Common Ground
7	5.3.12	"The Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site have been screened in for further assessment, but only in relation to potential impacts on qualifying bird species and potential effects associated with water quality."	Has NE made comments on the conclusion of the screening stage – in particular, are they in agreement with the impacts and features taken forward for appropriate assessment? Evidence of consultation and agreement by NE on this point should be provided as per point 1 above.	Yes, NE are in agreement with the impacts and features taken forward for Appropriate Assessment. Details of the agreement of this will be set out within the Statement of Common Ground
8	5.11.1	"Those sites and features subsequently taken forward into the AA stage as a result of the screening exercise are included in".	Incomplete sentence/ missing reference to Table?	Missing table reference updated
9	6.4.4	"shows information on disturbance/displacement for the 4 individual qualifying species scoped in to the AA".	Incomplete sentence/ missing reference to Table?	Missing table reference updated
10	Chapter 6	n/a	Where reference is made to specific measures such as restrictions on night time working (paragraph 6.4.12); provision of a construction phase lighting scheme (paragraph 6.4.13) and avoidance of works during the winter period (paragraph 6.4.15), it should be stated in the HRA report how each measure would be secured through the REAC/DCO.	Further clarification text added to Chapter 6 to confirm that each of the measures will be outlined in the CEMP/ REAC and secured in the DCO
11	Chapter 6	Noise effects; Disturbance/displacement distances	It is acknowledged that the noise modelling has not yet been finalised. The anticipated noise levels which would be experienced by birds within and outside of the 300m zone (during both construction and operation) should be quantified in the final HRA report. With regards to the 300m disturbance/displacement distance which has been utilised in the assessment (as explained in para 6.4.5 of the draft HRA report), suggest adding cross-reference to where evidence of agreement with NE is presented (Appendix 5?).	The noise assessment has now been completed and the HRA updated to show the anticipated noise levels which would be experienced by birds within and outside of the 300m zone (during both construction and operation) Reference to NE agreement of the 300m buffer will be set out within the Statement of Common Ground
12	Table 10	Ramsar criterion 4: Assemblages of international importance: Species with peak counts in winter:	Should this be Criterion 5?	Yes, typo amended

Point	Report para	Extract from Report	The Planning Inspectorate Question/ Comment	Response
		223,709 waterfowl (5 year peak mean 1998/99-2002/2003)		
13	Table 19	n/a	It is noted in Table 19 that the details of mitigation measures relating to impacts from disturbance are yet to be agreed with NE, but that discussions are ongoing. Specific measures relating to water quality have not yet been defined. The HRA Report should include a detailed description of all mitigation measures (including how each is secured in the REAC/DCO – with reference to specific DCO requirements), and should provide an agreement by NE as per point 1 above.	Table 19 updated to reflect all mitigation measures for the Scheme. Agreement of the mitigation measures with NE will be set out within the Statement of Common Ground
14	Table 19; para 7.1.4	Mitigation Strategy	A Bird Mitigation Strategy is referenced in Requirement 4 of the draft DCO. Presumably this is the same as the 'Mitigation Strategy' referenced in Table 19 and para 7.1.4 of the HRA report, but for the avoidance of doubt suggest amending the references in the HRA report.	References in the HRA Report have been updated to reflect references in the draft DCO
15	Screening matrices 1 and 2	n/a	Para 5.3.9-10 state that "However, further assessment is required as to whether the Scheme would lead to any likely significant indirect effects, in terms of water quality, on the qualifying features of the Morecambe Bay Ramsar site or the Morecambe Bay and Duddon Estuary SPA. This potential impact has been screened in to the AA". It is not apparent from the corresponding screening matrices (1 and 2) that this impact has been screened into the AA –should the 'Change in water quality' column be amended to include ticks rather than crosses in some instances? Footnote G to these matrices indicates that LSE cannot be excluded for construction phase impacts to water quality.	'X' amended to a '✓' in matrices 1 and 2 to confirm that water quality has been screened into the Appropriate Assessment for some species
16	n/a	n/a	The HRA report would benefit from a brief explanation of why impacts from decommissioning have not been considered. Reference should also be made to any likely maintenance works, including confirmation of whether any likely significant effects could occur as a result of such works.	Reference to decommissioning included within Section 5.8. Reference to maintenance works included in the HRA Report

Report Title: A585 Windy Harbour to Skippool Improvement Scheme Habitats Regulations Assessment, ES Chapter 8: Biodiversity and draft Protected Species Licences

Doc Ref / date: 03/05/19

Reviewer: Natural England

Paragraph Number	Natural England Comment	Arcadis Response	NE Response (April 2019)	Arcadis Response (May 2019)
HRA General Comments				
5.1.4	The HRA analysis (in section 6 of this letter) should be using and referencing the Morecambe Bay & Duddon Estuary SPA Draft Supplementary Advice Document which has been available since 14 September 2018.	Updates have been made in Sections 6.3.3 and 6.5.2 to reference the Supplementary Advice.	Ok	No further response required.
5.1.5	There are several places within the HRA which refers to mitigation 'where possible'. These include paragraphs 7.4.15 and 7.7.6. This should be removed as 'where possible' is unacceptable in HRA terms because it does not provide the necessary level of certainty that an impact would not occur.	Reference to 'where possible' has been removed to demonstrate that the mitigation will be delivered within paragraphs 7.4.15 [now 7.4.19] and 7.7.6 of the HRA (document reference TR010035/APP/5.4).	Ok	No further response required.
5.1.6	Paragraph 7.4.23 in the HRA references the temporary bird mitigation area and lists this as a 'precautionary measure'. This mitigation is required to offset disturbance to three key SPA and Ramsar species during construction. The need for this mitigation is clearly evidenced and this should not be referred to as 'precautionary' mitigation.	Paragraph 7.4.23 [now 7.4.25] of the HRA (document reference TR010035/APP/5.4) has been amended to remove reference to 'as a precautionary measure'.	Ok	No further response required.
5.1.7	In the HRA, Table 23 of section 7.8.2 regarding Direct loss of foraging/roosting habitat from construction is contradictory; it notes that mitigation is not required, then concludes no adverse effect with mitigation in place. Mitigation is clearly being considered and so the field labelled 'Mitigation required' should say 'Yes'.	The third column of Table 23 within the HRA (document reference TR010035/APP/5.4) has been amended to remove 'with mitigation in place'.	Ok	No further response required.
5.1.8	Paragraph 7.3.1 in the HRA regarding Embedded Mitigation - it would be useful to include a list of the embedded mitigation within the HRA as this is not clear which mitigation measures are considered to be 'Embedded'.	Mitigation considered to be 'embedded' is provided in Section 7.3 of the HRA (document reference TR010035/APP/5.4). However, it should be noted that there is no standard and accepted definition of what is considered to be 'embedded' mitigation.	Ok	No further response required.
5.1.9	Under Schedule 8 Deemed Marine Licence, Part 2, 4. (a) and (b), none of this work is reflected in the submitted HRA and therefore the impacts of the project on the marine environment/ Morecambe Bay SPA have not been considered. This assessment needs to be included within the HRA and a separate MCZ assessment submitted before the Marine Licence can be granted	Section 6.2 of the HRA (document reference TR010035/APP/5.4) has been amended to include reference to the pMCZ. As the qualifying feature of the pMCZ is smelt and is not a qualifying feature of any European designated sites, or Ramsar sites considered in the assessment, no further consideration of the pMCZ is required within the HRA. A separate MCZ screening assessment has	Ok	No further response required.

Paragraph Number	Natural England Comment	Arcadis Response	NE Response (April 2019)	Arcadis Response (May 2019)
		been prepared and submitted to the Marine Management Organisation as part of the Marine Licence application. Note: the only element of the Scheme considered to be 'marine works' is the replacement of Skippool Clough culvert which involves demolishing and replacing the north headwall located within the mean high-water springs.		
HRA Water Quality and Run-off				
5.2.1	We agree with the conclusion of the appropriate assessment that mitigation measures are required for water run-off however there are no details of the proposed mitigation – there are only links to the Outline CEMP which does not include any specific measures to combat water run off/pollution via Main Drain.	Further detail has been included in Section 7.4.45 [now 7.4.55] and Table 20 of the HRA (document reference TR010035/APP/5.4) and within the draft Pollution Control Plan appended to the Outline CEMP (Appendix G) (document reference TR010035/APP/7.2) – this document will be submitted at Deadline 1.	Will make comments when seen amended Outline CEMP.	Awaiting further comment - Pollution Control Plan issued to NE for comment 03/05/2019. Revision 1 of the Pollution Control Plan (document reference TR010035/APP/7.2 Appendix G – Rev 1) will be issued to the Inspectorate at Deadline 2.
5.2.2	The same conclusion has also been made in the Environmental Statement Chapter 8 Biodiversity (paragraph 8.6.5) but again, no details have been included.	Further detail has been included within the draft Pollution Control Plan appended to the Outline CEMP (Appendix G) (document reference TR010035/APP/7.2)– this document will be submitted at Deadline 1.	Will make comments when seen amended Outline CEMP.	As above.
5.2.3	We have previously advised that detailed mitigation measures are needed to demonstrate that the proposed mitigation is sufficient to rule out adverse effect i.e. provide the necessary level of certainty. There must be reasonable scientific doubt, that the project will not have an adverse effect on integrity before giving consent.	Further detail has been included in Section 7.4.45 [now 7.4.55] and Table 20 of the HRA (document reference TR010035/APP/5.4) and within the draft Pollution Control Plan appended to the Outline CEMP (Appendix G) (document reference TR010035/APP/7.2), to confirm that the Scheme will not have an adverse effect on the integrity of the European sites. The updated draft Pollution Control Plan will be submitted at Deadline 1.	Will make comments when seen amended Outline CEMP.	As above.
5.2.4	Appendix 5 of the submitted HRA includes a table of how Highways England have taken into account Natural England's previous comments. For water quality it states that 'Additional text will be added to the next iteration of the HRA to confirm the details of the water quality measures which will be implemented to protect water quality in the SPA/Ramsar site.' The additional text included now relies on mitigation within the Outline CEMP, included as appendices which have not been submitted. To be effective mitigation within the HRA, either the relevant appendices in the Outline CEMP need to be	Further detail has been included in Section 7.4.45 [now 7.4.55] and Table 20 of the HRA (document reference TR010035/APP/5.4) and within the draft Pollution Control Plan appended to the Outline CEMP (Appendix G) (document reference TR010035/APP/7.2). As stated above the Pollution Control Plan will be submitted at Deadline 1.	Will make comments when seen amended Outline CEMP.	As above.

Paragraph Number	Natural England Comment	Arcadis Response	NE Response (April 2019)	Arcadis Response (May 2019)
	submitted upfront or full details of the mitigation requirements need to be included in the HRA and Draft DCO. The Environmental Statement Chapter 8 Biodiversity should also be updated with details of the mitigation proposed.	Chapter 8: Biodiversity (document reference TR010035/APP/6.8) has not been updated as it is considered the pollution prevention mitigation proposed is adequately secured by the draft Pollution Control Plan.		
HRA - Night Time Construction Working				
5.3.1-5.3.4	Paragraph 7.4.12. In the HRA, it is stated that night time working will not exceed 95 days over the 2-year construction period, that this will be agreed in advance with the LPA and the restrictions outlined in the Outline CEMP and REAC. This concludes by saying that this is short-term and small-scale working and therefore any potential disturbance or displacement effects are negligible and not significant. We disagree with this conclusion and would consider that up to 95 days over a two-year construction period could potentially be significant especially if the majority of those 95-night working days are concentrated over the winter period. Therefore, this needs clarification and further analysis and potentially further mitigation measures. Also, there are no restrictions outlined in the Outline CEMP relating to night time working. And where there are requirements and restrictions for night time working included within submitted documents, the detail differs. This needs to be clarified.	Additional text has been added to paragraph 7.4.12 of the HRA (document reference TR010035/APP/5.4) to provide further details of potential night working requirements during the construction phase of the Scheme. No further mitigation is required as no significant adverse disturbance / displacement effects of night time working are anticipated.	There is a discrepancy in para 7.4.13 with quoting of 31 nights then 30 night of night time working. Also need to get conclusion wording right, should be no likely significant effect or no adverse effect on integrity, not both. We are still concerned that Skippool Junction & Bridge are very close to the bird mitigation area and there doesn't appear to be adequate consideration of this when night time working – will be works affect the bird mitigation area? What consideration is there of the lighting required?	Typo corrected in para 7.4.13 – 30 nights within Revision 2 of the HRA (document reference TR010035/APP/5.4 – Rev 2). Wording amended. (Paragraph 7.4.14) within Revision 2 of the HRA (document reference TR010035/APP/5.4 – Rev 2). Night time works at Skippool Junction and Bridge (totalling 22 days across two winters) would be screened from the bird mitigation area by existing development and/or vegetation present in the vicinity of Old Mains Road. Text amended to clarify (paragraph 7.4.13) REAC section 4AL also updated. REAC issued to NE for comment on 03/04/2019. Revision 1 of the REAC will be issued to the Inspectorate at Deadline 2.
5.3.5 - 5.3.7	The REAC reference no. 4Z states that – 'Construction works would be phased to allow the most sensitive sections of the Scheme to be constructed outside of the winter months. In addition, … avoiding night-time working would be required.' This sentence is also repeated in the Environmental Statement Chapter 8 Biodiversity (paragraph 8.6.8). Natural England supports this however, REAC reference no. 4AL states 'To ensure no potential impacts on birds utilising adjacent habitats. Any night working would be agreed in advance with the local authority, and the restrictions outlined within the Outline CEMP (document reference TR010035/APP/7.2)'. However, agreeing night working measures in advance with the LPA is not considered an acceptable form of	Additional text has been added to paragraph 7.4.12 to 7.4.16 of the HRA (document reference TR010035/APP/5.4) to provide further details of potential night working requirements during the construction phase of the Scheme. Commitment 4AL within the REAC (document reference TR010035/APP/7.3) has been updated to include further detail of night time restrictions. No significant adverse disturbance / displacement effects of night time working are anticipated.	As above & will make comments when seen updated REAC.	As above. Additional text added to Revision 1 of the REAC 4AL to confirm no adverse effect on integrity from current proposals and consultation with NE will ensure any deviation from this is properly assessed.

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	mitigation for the HRA, and as already stated, we can find no reference to any restrictions included within the Outline CEMP.			
HRA - Noise Disturbance				
5.4.3	We previously advised that – 'the HRA should include the existing baseline and what the predicted noise levels will be (measured in LAeq and LAmax). We also expect to see mitigation measures (e.g. acoustic hoarding) being built into the proposed development that would negate / reduce noise impact if required.	It was not deemed necessary to include predicated noise levels (LAeq or LAmax) as the assessment assumes that birds with 300m of the Scheme could be affected by noise disturbance, therefore mitigation land has been included on this basis. The inclusion of the mitigation land (which will provide alternative habitat for birds during the construction phase of the Scheme) also negates the need to include additional acoustic hoarding (specifically for noise disturbance of birds) during the construction phase of the Scheme.	Ok	No further response required.
5.4.4	We note that a noise report has now been submitted and is referenced in the HRA (Environmental Statement Chapter 6.11) however this report is based solely on human receptors and does not include any consideration of birds as sensitive receptors.	Chapter 11: Noise and Vibration (document reference TR010035/APP/6.11) has been undertaken in accordance with the methodology outlined within the DMRB. Birds are not defined as a sensitive receptor within the methodology, although, designated sites are. There were no Ramsar sites, SACs, SPAs or SSSIs identified within the noise study area, therefore the assessment did not assess effects on these features. Reference to the noise assessment outlined in Chapter 11: Noise and Vibration (document reference TR010035/APP/6.11) in relation to birds has been removed from the HRA (document reference TR010035/APP/5.4). The assessment assumes that birds within 300m of the	Ok	No further response required.

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		Scheme could be affected by noise disturbance and the mitigation land has been included within the Scheme.		
5.4.5	The HRA acknowledges that there is potential for noise impacts throughout the construction period but gives no information or summary of where the greatest risk may occur.	Given the inclusion of the mitigation area, it was not deemed necessary to identify specific locations within the Scheme where noise impacts may occur to a greater or lesser degree, as part of the HRA (document reference TR010035/APP/5.4) as with the bird mitigation land in place it is considered there would be no significant effects on the integrity of the SPA/Ramsar site. ~~The construction phasing would be finalised following the appointment of the main works contractor. A commitment has been included within the REAC (document reference TR010035/APP/7.3) to state the Contractor (once phasing has been finalised) will include sections of the Scheme considered to be sensitive, what constitutes loud activities and what would be avoided at high tide within the final REAC. Natural England will have opportunity to comment on the final REAC when the Contractor issues it to discharge the DCO Requirements.~~	This reasoning needs to be included within the HRA, so it is clear that noise impacts could be significant and therefore this is the mitigation applied to mitigate this impact.	Text amended (paragraph 7.4.26) within Revision 2 of the HRA (document reference TR010035/APP/5.4 – Rev 2).
5.4.6	The HRA cites an increase in noise levels of 0 – 5db but again gives no details of where, when or what distance to the sensitive bird receptors.		As above.	As above.
5.4.7 - 5.4.8	Appendix 5 of the submitted HRA includes a table of how Highways England have taken into account Natural England's previous comments. HRA paragraph 7.3.4 it states that 'Acoustic hoarding has been incorporated into the Scheme design'. However, it is not clear whether this is as part of the construction period or at end use and there are no further details regarding this within the HRA. This should be clarified. Therefore, we consider that this part of the HRA, including the conclusions at paragraph 7.4.23 needs to be re-assessed.	Acoustic hoarding and bunding is embedded into the operational design of the Scheme and presented on the Environmental Masterplan (document reference TR010035/APP/6.19). Text has been added to HRA (Section 7.7.4) (document reference TR010035/APP/5.4).	Ok	No further response required.
5.4.9 - 5.4.10	We would also disagree with the conclusion that 14 significant counts of flocks of SPA birds during the two-year survey period doesn't demonstrate regular use. Natural England has already agreed the 300m buffer and the work to ID the relevant SPA species within this buffer has been completed and has shown, what Natural England considers to be, a significant number of SPA species using the land within the 300m buffer. In addition,	The HRA assessment (document reference TR010035/APP/5.4) accepts that there will be an increase in noise disturbance during construction within 300m of the Scheme. However, given the limited number of records of significant numbers of birds and taking into account that half of the 14 flocks comprising 1% or	It is the wording 'doesn't demonstrate regular use' which is contradictory to then providing mitigation for SPA species. Check the wording to make sure that it backs up the need for the proposed mitigation.	Text amended (paragraphs 7.4.24/5 and 7.4.43) within Revision 2 of the HRA (document reference TR010035/APP/5.4 – Rev 2).

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	given that there are significant numbers of three SPA species (pink footed goose, lapwing and curlew) within the 300m buffer, the total habitat loss is 48ha and the construction period covers two winter periods, it's our advice that mitigation for noise disturbance, in addition to the bird mitigation area, is required to avoid an adverse effect on the integrity of the SPA and Ramsar site.	greater of SPA species were recorded in close proximity to the existing A585 road (and therefore already subject to noise disturbance), provision of an alternative feeding area away from the construction area is considered to provide the most effective mitigation. This is considered sufficient to avoid an adverse impact on the integrity of the SPA, without requiring further noise mitigation measures.		
5.4.11 - 5.4.12	The REAC reference no. 4Z states that – 'Construction works would be phased to allow the most sensitive sections of the Scheme to be constructed outside of the winter months. In addition, avoiding particularly loud activities at high tide when birds are more likely to be utilising inland habitats….'. This sentence is also repeated in the Environmental Statement Chapter 8 Biodiversity (paragraph 8.6.8). Natural England supports this however there are no details as to which sections of the project are considered to be sensitive and what constitutes loud activities. This should be clarified and represented in the HRA.	The construction phasing would be finalised following the appointment of the main works contractor. A commitment has been included within the REAC (document reference TR010035/APP/7.3) to state the Contractor (once phasing has been finalised) will include sections of the Scheme considered to be sensitive, what constitutes loud activities and what would be avoided at high tide within the final REAC. Natural England will have opportunity to comment on the final REAC when the Contractor issues it to discharge the DCO Requirements.	It needs to be clear what mitigation the REAC needs to address and what it is trying to achieve. This needs to be clear within the REAC so we have confidence that the avoidance measures proposed are carried forward by the Contractor at project stage.	Wording in the REAC and our previous response was based on information from the ES Chapter 8: Biodiversity (document reference TR010035/APP/6.8) which has not been updated in line with the HRA since the DCO submission in October 2018. The inclusion of the mitigation land means any birds affected by any part of the Scheme and at any time (including high tide) have suitable alternative habitat to use during the construction phase of the Scheme. The potential mitigation options have therefore been removed from Revision 1 of the REAC (document reference TR010035/APP/7.3) and a correction to ES Chapter 8: Biodiversity paragraph 8.6.8 submitted in October 2018 (refer to the Environmental Statement Changes and Corrections Document (document reference TR010035/APP/7.11) to be consistent with the updated HRA. These documents will be submitted at Deadline 2.
HRA – Vibration				
5.5.2 - 5.5.4	The only reference within the HRA to vibration relates to the report written for the Environmental Statement - Chapter 11 Noise and Vibration. There is no assessment within the HRA to look at the likely significant effects from vibration impacts during construction. As previously stated, the Noise and Vibration report has been written based solely on human receptors and does not include any consideration of birds or habitats as sensitive	Consideration of vibration from piling has been included within Section 7.4 of the HRA (document reference TR010035/APP/5.4). No significant effects are anticipated.	We can't find any reference within the amended HRA (including within Section 7.4) to impacts from vibration or piling.	See paragraphs 7.4.38 -7.4.42 (sub heading Vibration Effects) within Revision 2 of the HRA (document reference TR010035/APP/5.4 – Rev 2).

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	receptors. Therefore, we are concerned that there is no assessment of vibration impacts on SPA species within the HRA or within the Environmental Statement and this should be remedied.			
HRA - Waterbird Assemblage				
5.6.2 - 5.6.3	Section 6.12 of the HRA summarises what should be considered at the Appropriate Assessment (AA) stage. This notes that waterbird assemblage should be considered in relation to disturbance/displacement and water quality (construction only); it does not include consideration of loss of forage/roosting habitat (construction or operation). It is unclear why this has been screened out and Natural England considers that this impact should be considered at AA. The consideration of construction impacts within the AA relating to impacts to water quality does not include any consideration of the waterbird assemblage (HRA paragraphs 7.5.3 to 7.5.5).	Assessment of the waterbird assemblage has been included within Sections 6.8 and 7.4.54 (as required) and Table 14 (Section 6.12). Paragraphs 7.5.3 to 7.5.5 relate to in-combination water quality effects therefore the waterbird assemblage has not been specifically assessed in these paragraphs.	Ok	No further response required.
5.6.4	HRA paragraphs 7.7.9 to 7.7.11 consider Operational Loss of Foraging/Roosting Habitat but does not include consideration of the waterbird assemblage.	Reference to and assessment of the waterbird assemblage has been added to the HRA within Section 7.7 (document reference TR010035/APP/5.4). There is no change to the conclusions reported.	Ok	No further response required.
5.6.5	The HRA table 23, paragraph 7.8.2 does not address waterbird assemblage relating to disturbance or loss of foraging/roosting habitat.	Reference to and assessment of the waterbird assemblage added to the HRA within Section 7.8 (document reference TR010035/APP/5.4). There is no change to the conclusions reported.	Ok	No further response required.
5.6.6	The overall conclusion (HRA paragraphs 8.1.1 to 8.1.4) does not refer to the waterbird assemblage.	Reference to and assessment of the waterbird assemblage added to the HRA within Section 8.1 (document reference TR010035/APP/5.4). There is no change to the conclusion reported.	Ok	No further response required.
Environmental Statement Chapter 8 Biodiversity - Wyre-Lune proposed Marine Conservation Zone				
5.7.2 - 5.7.3	We note the inclusion of paragraph 8.5.7 identifying the Wyre-Lune recommended Marine Conservation Zone (rMCZ) as being partially within the draft order limits however, the MCZ is now a proposed MCZ (pMCZ) since 8 June 2018 and therefore must now be treated as a material consideration for all proposals. Therefore, the Environmental Statement should now be updated to reflect the current position of the pMCZ.	A separate MCZ screening assessment has been undertaken and issued to the Marine Management Organisation to inform the application for Marine Licence. As noted above the works considered to be 'marine works' are minor. No updates have been made to Chapter 8: Biodiversity (document reference TR010035/APP/6.8) as the change from	Ok	No further response required.

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		a recommended MCZ to a proposed MCZ would not change the conclusions of the assessment on this receptor. The pMCZ was assessed in Chapter 8 as though it was MCZ. A corrections document will be submitted at Deadline 1 and this update will be included within it.		
5.7.4 - 5.7.5	In addition, in accordance with Section 126 of the Marine and Coastal Access Act (MCAA) (2009), this guidance, an MCZ assessment should also be completed to fully assess the impact of the project on the pMCZ and to allow the DCO to grant a Deemed Marine Licence. The Environmental Statement Chapter 8 Biodiversity should also be updated with the conclusions from the MCZ assessment.	As above.	Ok	No further response required.
Outline CEMP - Appendix B Bird Mitigation Strategy				
5.8.2 - 5.8.4	There is still an agreed, outstanding matter to be resolved concerning Highways England obtaining the shooting rights around the mitigation area for the duration of the construction period. However, after reviewing the submitted strategy we are concerned that the reference to removing the shooting rights from the foreshore as well as from the surrounding fields has been removed from the submission version. The strategy should be amended to clarify that, in order for the mitigation site to be effective, all the shooting rights from the surrounding fields and the foreshore will be removed for the duration of the construction works.	Highways England is currently liaising with the Duchy of Lancaster's land agents to prevent shooting on the foreshore opposite the bird mitigation area during the construction phase of the Scheme. The Bird Mitigation Strategy (document reference TR010035/APP/7.2 – Appendix B) submitted to the Inspectorate included a section on obtaining shooting rights it was not omitted – refer to Section 2.4. At Deadline 1 an updated Bird Mitigation Strategy will be submitted which will outline an updated position regarding shooting rights.	We will comment on the updated Bird Mitigation Strategy once it is available.	The Bird Mitigation Strategy (document reference TR010035/APP/7.2 – Appendix B) will be updated once legal agreements associated with the shooting rights and land management have been agreed. This is currently in progress and the updated Strategy will be submitted to NE for comment as soon as it is available.
Soils, including Best and Most Versatile (BMV) Land				
5.9.2	The majority of the land within the project is considered to be BMV land and there is currently no direct mitigation proposed for the loss of the agricultural land. The land is predominantly grass for silage/haylage and grazing with some land under arable production. No detailed ALC survey has been carried out. The ALC data which has been provided is for strategic planning purposes and should not be presented at a scale greater than 1:250	It is accepted that the available ALC mapping used for the assessment in Chapter 10: People and Communities (document reference TR010035/APP/6.10) is only for strategic purposes, and this is stated in paragraph 10.6.3. Presenting the mapping at a scale of 1:20,000 was undertaken to allow the	Ok	No further response required.

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	000. This data has been presented at 1:20 000 which is misleading. It does however show that there is the potential for a significant area of BMV land to be affected.	extent of the Scheme to be understood in detail and was not meant to be misleading and the worst-case scenario (all land comprises BMV land) was assessed to take account of this.		
5.9.3 - 5.9.4	We understand that Highways England propose to carry out an ALC survey prior to the commencement of construction and Natural England has agreed this approach on the basis that the current assessment is based on a worst-case scenario. A Requirement therefore should be added to the DCO for Highways England to undertake the ALC survey prior to construction works commencing and that survey should be submitted to Natural England for comment before the Requirement is discharged.	Noted – A commitment to undertake soil surveys (which would gather ALC information) is included within the Record of Environmental Actions and Commitments (REAC) (document reference TR010035/APP/7.3) which is secured by Requirement 4 of the dDCO (document reference TR010035/APP/3.1). Before Requirement 4 is discharged, as part of the standard process Natural England would have opportunity to comment.	Ok	No further response required.
5.9.5	The submitted soil data has also been presented incorrectly. This data should be presented at 1:250 000 and it has been enlarged to 1:15 000. This data is not suitable as a substitute for a Soil Management Plan or a detailed Soil Resource Survey. We understand that a Soil Management Plan has been written however, this may have to be amended because the Soil Resource Survey will inform the Soil Management Plan.	As previously noted, the scale used was to allow the detail of the Scheme to be visible. A draft SMP has been written and is appended to the Outline Construction Environmental Management Plan (document reference TR010035/APP/7.2) this document outlines a pre-construction soil survey would be undertaken to inform the final version developed by the Contractor. There is also a commitment within the REAC (commitment 6G) (document reference TR010035/APP/7.3) which states '*Soil handled and stored in line with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Full details will be presented in a Soil Management Plan which will be informed by a detailed soil survey undertaken in advance of any soil stripping operations commencing.*'	Ok	No further response required.
5.9.6	We note the commitment to producing a Soil Resource Plan as part of the Outline CEMP, this should be provided prior to construction for agreement with Natural England to check that the soil resource is being adequately protected and properly handled.	Noted – A commitment to prepare a SRP is included within the REAC (Commitment 1B) (document reference TR010035/APP/7.3) which is secured by Requirement 4 of the dDCO (document reference TR010035/APP/3.1). Before	Ok	No further response required.

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		Requirement 4 is discharged, as part of the standard process Natural England would have opportunity to comment.		
5.9.7	Without the ALC and soil survey, a mitigation plan cannot be written as per the National Policy Statement for National Networks (paragraph 5.179). A Requirement for the production of this mitigation plan should be included within the Draft DCO and Natural England would like to comment on this Plan before it is considered acceptable.	Noted – the commitment to prepare the final SMP and SRP is included within the REAC (document reference TR010035/APP/7.3) which is secured by Requirement 4 of the dDCO (document reference TR010035/APP/3.1). Before Requirement 4 is discharged, as part of the standard process Natural England would have opportunity to comment.	Ok	No further response required.
Protected Species - Great Crested Newts				
5.11.1 - 5.11.2	The information which has been submitted as part of the draft licence is inconsistent, un-clear and is in-adequate to assess what habitat is being lost and what habitat is being provided as compensation. Therefore, Natural England is currently unable to assess the draft licence under the favourable conservation test.	An updated draft licence will be issued to Natural England addressing all outstanding comments on the 29/03/2019.	Ok – this has now been received and is currently being looked at.	Awaiting NE feedback
5.11.3 - 5.11.5	Based on the current figures provided, it is Natural England's opinion that insufficient compensation has been provided to grant the licence under License Policy 1. Further information and assessment therefore need to be provided before Natural England can consider issuing a letter of no impediment. This may also necessitate alterations to the Environmental Statement Chapter 8 Biodiversity.	An updated draft licence will be issued to Natural England addressing all outstanding comments on the 29/03/2019. It is not envisaged that any updates to Chapter 8: Biodiversity (document reference TR010035/APP/6.8) are required.	Ok	No further response required.
Protected Species - Bats (various species)				

Paragraph Number	Natural England Comment	Arcadis Response	NE Response (April 2019)	Arcadis Response (May 2019)
5.12.2	There an outstanding issue regarding Skippool Bridge (ref B5) and whether hibernacula roost surveys have been undertaken.	An updated draft licence will be issued to Natural England addressing all outstanding comments on the 29/03/2019.	Ok – this has now been received and is currently being looked at.	Awaiting NE feedback
5.12.3	We are also recommending that further surveys are undertaken for structure ref B1 and that further details are provided regarding the capture and exclusion during construction.	An updated draft licence will be issued to Natural England addressing all outstanding comments on the 29/03/2019.	Ok	No further response required.