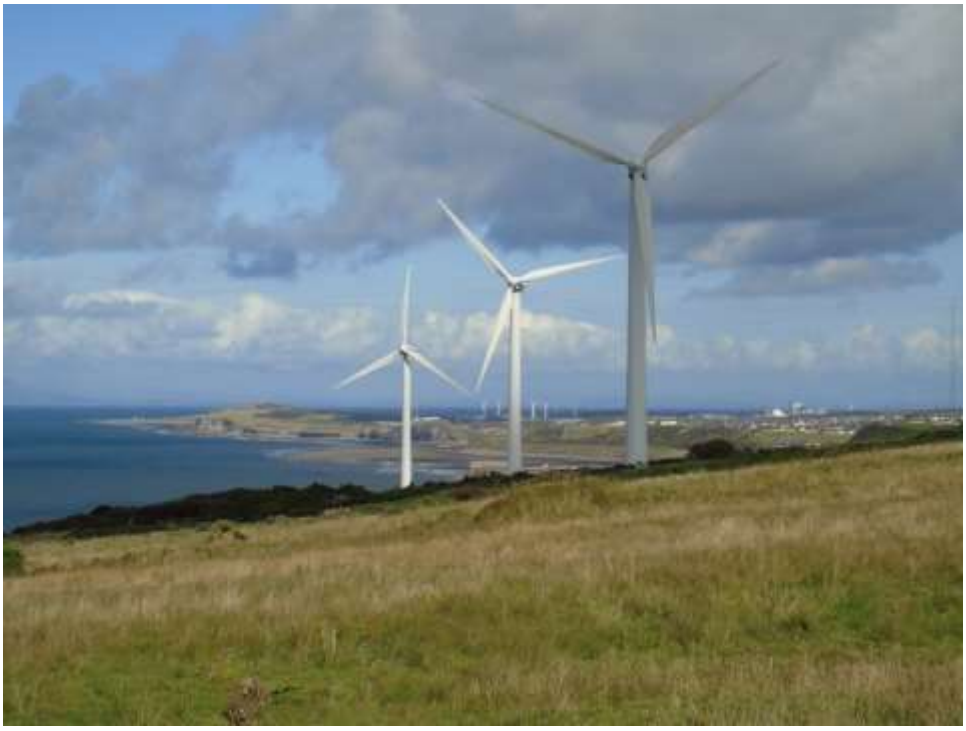
Park House Farm Wind Farm, Lowca, Cumbria

Report to Inform Habitats Regulations Assessment Stage 1 & 2



For Cannock Wind Farm Services Ltd

May 2020

4th Floor, Rotterdam House, 116 Quayside, Newcastle Upon Tyne, NE1 3DY

Tel: 0191 249 9828

Email: ecology@wyg.com

Document Control

Project:	Park House Farm Wind Farm
Client:	Cannock Wind Farm Services Limited
Job Number:	A108663
File Origin:	N:\Projects\Projects A108000\A108663 Lowca Wind Farm\REPORTS

Issue 2	April 2020	FINAL
Prepared by:		Kirstin Aldous MCIEEM **Principal Ecologist**
And:		Phil Preston MCIEEM **Principal Ecologist**
Checked By:		Penny Ward MCIEEM CEnv **Principal Ecologist**
Verified By:		Rachel Kerr MCIEEM CEnv **Associate Ecologist**

Rev:	Date:	Updated by:	Verified by:	Description of changes:
2	12.05.20	Phil Preston	Rachel Kerr	• Updated title page, header, footer, contents • Updated **Executive Summary** to include Stage 2 result and conclusion • Revision of term "site" to "study area" throughout • Updated **Section 1.1** to include reference to Stage 2 • Updated **Section 1.4** to include reference to Stage 2 • Updated **Section 1.5** to include Stage 2 purpose • Updated **Section 6.1.1** to include additional assessment to Stage 1 In-Combination - Projects • Addition of Stage 2 HRA reporting **Section 8**

Contents

Appendix A – Report Conditions

Executive Summary

Contents	Summary
Site Location	The 'study area' is located on land at Park House Farm, to the north of the village of Lowca, in Cumbria - Ordnance Survey National Grid Reference NX 98376 23260. The site comprises seven wind turbines set within predominantly grassland habitat.
Development Proposals	The planning application seeks to extend the life of the seven existing turbines within the study area until the end of March 2030.
Existing site information	The following reports have been reviewed to inform the assessment: • WYG (2020a) Ecological Appraisal
Scope of this assessment	WYG was commissioned to prepare a report to inform Habitats Regulations Assessment Screening.
Results of Stage 1 Screening; **Natura 2000 sites screened in.**	Using a precautionary approach, this screening assessment has concluded that in the absence of mitigation, there are Likely Significant Effects (LSE) on qualifying interest features of the following Natura 2000 site: • The Solway Firth pSPA
Result of Stage 2 Appropriate Assessment	Appropriate Assessment has been carried out for the following pathways of effect: • Direct mortality or injury of birds from collision with turbine blades or towers (alone and in-combination); • Pollution (alone or in-combination).
Conclusion	The stage 2 Appropriate Assessment concludes that when relevant mitigation measures are taken into consideration, this project is unlikely to result in any appreciable or discernible impact upon the integrity of the relevant internationally designated sites either in isolation or in-combination with any other plans or projects.

Glossary

AA	Appropriate Assessment
ALSE	Assessment of Likely Significant Effects
CEnv	Chartered Environmentalist
CJEU	Court of Justice of the European Union
CIEEM	Chartered Institute of Ecology & Environmental Management
Habitats Regulations	Conservation of Habitats and Species Regulations 2017
DTA	David Tyldesley Associates
HRA	Habitats Regulations Assessment
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
MCZ	Marine Conservation Zone
Natura 2000 site	A European site designated for its nature conservation value
NE	Natural England
OSNGR	Ordnance Surveys National Grid Reference
pSPA	potential SPA
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site(s) of Special Scientific Interest
VP	Vantage Point
W&CA	Wildlife & Countryside Act 1981 (as amended)
WeBS	Wetland Bird Survey
ZoI	Zone of Influence

1.0 Introduction

1.1 Background

WYG was commissioned by Cannock Wind Farm Services Limited in January 2020 to prepare a report to inform Habitats Regulations Assessment (HRA) Screening (also known as an Assessment of Likely Significant Effect or ALSE) and Appropriate Assessment (AA) for a proposed extension to the life of Park House Farm Wind Farm in Lowca, Cumbria.

This report has been prepared by WYG Principal Ecologist Kirstin Aldous BSc (Hons) MSc MCIEEM and Phil Preston BSc (Hons) MSc MCIEEM should be read in conjunction with the Report Conditions in Appendix A.

1.2 Site Location

The 'study area' is located on land at Park House Farm, to the north of Lowca, in Cumbria – see Figure 1. The study area is centred at Ordnance Survey National Grid Reference (OSNGR) NX 98376 23260 and comprises seven wind turbines set within grass dominated habitat. The west coast railway line forms the western boundary of the site, separating the site from coastal habitats and the Solway Firth. In the wider area there are arable and grassland habitats to the north, south and east.

1.3 Planning Application

The section 73 planning application seeks to vary the planning condition, which requires the wind farm to cease operating at the end of March 2020 with the effect of extending the life of the seven existing turbines on site until 2030.

The existing planning permission was granted consent in 1998 following a successful appeal against a refusal of planning permission by Copeland Borough Council - reference no: 4/98/0486/0. Construction commenced in 1999 and the existing wind turbines are currently consented to be operational until the end of March 2020

1.4 Requirements for Habitats Regulations Assessment

The European Directive (92/43/EEC), termed 'the Habitats Directive,' was introduced to protect and enhance species and habitats of nature conservation importance at the European level (European Commission, 2020). As outlined in Article 6 (3) and 6 (4) of this directive, an 'Appropriate Assessment' (AA) must be carried out on any plans or projects where it is considered that they are likely to have significant effects on Natura 2000 sites, either alone or in-combination with other plans or projects.

This report covers:

- Stage 1 of HRA - ALSE.
- Stage 2 of HRA, known as AA

Details regarding methods and relevant case law which steers assessment methodology for both stages is presented within Section 2.1.

1.5 Purpose of the Report

This report aims to inform the HRA screening process, identifying impact pathways which may result in likely significant effects (LSE) from the project on European (Natura 2000) designated sites within a defined Zone of Influence (ZoI). In addition, the stage 2 AA section assesses the effects of such pathways upon the integrity of relevant designated sites alone and in combination with relevant plans or projects.

2.0 Assessment Methodology

2.1 HRA Guidance

The HRA process involves the following tasks split according to the guidance stages, these are described below:

- **Stage 1: Screening** – the process which identifies the 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. This is also known as an 'assessment of likely significant affects' (ALSE);
- **Stage 2: Appropriate assessment** – 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, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts (in accordance with guidance following the recent decision by the CJEU; People Over Wind and Sweetman v Coillte Teoranta (C-323/17) regarding application of embedded mitigation at Stage 1 or Stage 2 of an HRA (Freeths, 2018);
- **Stage 3: Assessment of alternative solutions** – the process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site; and
- **Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain** – an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Over-riding Public Interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of IROPI).

The Stage 1 Screening Assessment comprises four steps, as described below:

- **Step 1.** Determining whether the project or plan is directly connected with or necessary to the management of the Natura 2000 site(s);
- **Step 2.** Describing the project or plan and the description and characterisation of other projects or plans that in-combination have the potential for having significant effects on the Natura 2000 site(s);
- **Step 3.** Identifying the potential effects on the Natura 2000 site(s); and
- **Step 4.** Assessing the likely significance of any effects on the Natura 2000 site(s).

The Stage 2 AA should identify the effects of those plans or projects on qualifying features of the European sites in relation to the Conservation Objectives of those sites and determine whether these effects will result in an adverse effect on the integrity of the designated site. Only where the decision maker (the Competent Authority), is satisfied that there will be no adverse effect on integrity, or where there are imperative reasons of overriding public interest, can the plan or project be approved.

It is important to note that Stage 1 has recently been called into question by recent European case law. In April 2018 the CJEU published it's ruling in the Case C323/17 (People Over Wind case) with regards to the Habitats Directive. Prior to this ruling standard practice was to incorporate mitigation into development proposals and assess within the HRA Stage 1 Screening stage. Mitigation could be

used to determine whether a project had the potential to have LSE on a European/International designated site. In employing this method, the need to proceed to a full AA was sometimes negated.

The ruling on the recent case determines that mitigation cannot be taken into account when considering the screening test for LSE (i.e. Stage 1). This may have implications for whether other projects can be screened out of requiring an AA (Freeths, 2018).

Compliance with this judgement is still under consideration with key statutory bodies and competent authorities; although, in the interim it is advised that this ruling be taken into account to avoid potential future legal challenge.

2.2 Information used in the Assessment

2.2.1 Desk Study

The following sources have been consulted during the preparation of this report for information relating to designated sites:

- The Joint Nature Conservation Committee (JNCC) website (www.jncc.defra.gov.org.uk) for information on Natura 2000 designated sites;
- The MAGIC website (www.magic.gov.uk) for information on statutory designated sites within 10 km of the site;
- The Copeland Borough Council Planning Portal (copeland.gov.uk) to search for existing planning applications within 10 km of the site;
- Copeland Local Plan 2013-2028: Core Strategy and Development Management Policies (Copeland Borough Council, 2013).

2.2.2 Field Surveys

WYG has produced a range of technical reports to accompany the planning submission. Of relevance to this assessment is:

- Ecological Appraisal (WYG 2020a).

2.2.3 Consultation

WYG consulted Natural England (NE) via its Discretionary Advice Service in August 2019. Following a meeting on the 12th August 2019, NE stated *"s73 application to be submitted - Baseline surveys have commenced in preparation. Natural England have no concerns. Though standard ecology surveys are likely to be required by the LPA*".

A later clarification from NE was sought with regard to the scope of survey works on 26th September 2019, and NE responded as follows: *"We have no concerns of any designated site impacts at Lowca, despite its proximity, as there is nothing that will be attract the pSPA birds inland to cause flights through the site, so these surveys are not required here".*

The local planning authority Copeland Borough Council was informed of the scope of works to be undertaken at Park House Farm wind farm to support the extension of life application and its response on the 9th January 2020 was as follows: *"It is considered that the scope of works outlined*

in your email of the 31st October 2019 is reasonable and appropriate given nature of the proposed development etc..
It is recommended that any justification or reasoning for the scoping out of specific works be explicitly detailed in the submission for the avoidance of doubt. Details of the consultation with Natural England should also be included for completeness."

No further consultation was held with NE to support the AA section of this report.

3.0 Ecological Baseline of the Site

3.1 Ecological Appraisal

3.1.1 Habitats

An Ecological Appraisal was completed on the 23rd September 2019 (WYG, 2020a). The following habitats were recorded within the physical footprint of the windfarm:

- Semi-improved acid grassland;
- Semi-improved neutral grassland;
- Improved grassland;
- Marshy grassland;
- Scattered scrub;
- Dense scrub;
- Bracken;
- Tall ruderal;
- Intact species poor hedgerow;
- Running water; and,
- Open water.

Habitats present within the site are shown in Figure 2.

4.0 Scope of the Assessment

4.1 Zone of Influence

Projects may have spatial implications, which can have further reaching effects than those predicted to fall within the development footprint. Specifically, it is recognised that distance between a proposed route and a designated site is not a definitive determinant as to the likelihood or severity of an impact occurring. Site variables such as prevailing wind conditions, surface and groundwater flow direction will all have an influence on the relative distance at which an impact can occur.

Additionally, the mobile nature of qualifying interest species must also be considered, since an adverse effect on the qualifying species of a designated site, even if they are present outside the designated site for which they are a qualifying feature, may still result in a significant adverse effect upon that designated site. Hence, a development some distance away from a European site could still have effects on the site and, therefore, needs to be considered as part of the screening process.

For this scheme, Natura 2000 sites within a maximum radius of 10 km of the study area were considered and are provided in section 4.2 below, along with a summary of the qualifying features. This ZoI was considered adequate to address potential LSEs on qualifying species within designated sites and on functionally linked land (as SPA birds may be affected). Marine Conservation Zones are included below. The boundaries of the designated sites are illustrated in Figure 3.

4.2 Identification and characterisation of Natura 2000 Sites

Table 1 presents information relating to each of the internationally designated sites within the ZOI for this project.

Table 1: Qualifying Features of Internationally Designated Sites

Designated Site	Features	Conservation Objectives	Site Condition /Vulnerabilities
Solway Firth pSPA - 242m west of the site at closest point (this site is to include the whole of the Upper Solway Flats and Marshes SPA)	The proposed marine features are: ○ Common *scoter Melanitta nigra* (non-breeding); 1590 individuals representing 2% of GB population; ○ Goosander *Mergus merganser* (non-breeding), 150 individuals representing 1% of GB population; ○ Red throated diver *Gavia stellata* (non-breeding); 530 individuals representing 3% of GB population. Proposed additional SPA review features: ○ Lapwing *Vanellus vanellus* (non-breeding); 5040 individuals representing 1% of GB population; ○ Ringed plover *Charadrius hiaticula* (non-breeding) 980 individuals representing 1% of GB population; ○ Cormorant *Phalacrocorax carbo* (non-breeding) 580 individuals representing 2% of the GB population; ○ Black-headed gull *Chroicocephalus ridibundus* (non-breeding) 13,730 individuals representing 1 % of GB population;	This proposed SPA has been specifically selected to protect areas used by non-breeding red-throated diver, common scoter and goosander (Natural England, 2019). The conservation objectives for the Solway Firth proposed SPA are: ○ To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution will be achieved through delivering the following objectives for each of the site's qualifying features: a) Avoid significant mortality, injury and disturbance of the qualifying features, so that the	The following activities are considered likely to affect the qualifying features of the pSPA: ○ Fishing – mobile gear; ○ Fishing – static gear; ○ Harvesting – intertidal shellfish, bait and blue mussel fishery; ○ Navigational and maintenance dredging; ○ Ports and harbours; ○ Recreational users (angling, boating, wildlife tours, wildfowling, jet skiing); ○ Renewables (wind, tidal). SNH anticipates that for activities not covered by the Advice to Support Management document, and for existing activities where no need for additional management has been identified, that impacts from these activities on the qualifying features can be

Designated Site	Features	Conservation Objectives	Site Condition /Vulnerabilities
	○ Common gull *Larus canus* (non-breeding) 12,490 individuals representing 2% of GB population; ○ Herring Gull *Larus argentatus* (non-breeding) 3030 individuals representing 0.4% of the GB population. Qualifying features of the existing Upper Solway Flats and Marshes SPA are non-breeding: barnacle goose *Branta leucopsis*, golden plover *Pluvialis apricaria*, bar-tailed godwit *Limosa lapponica*, pink footed goose *Anser brachyrhynchus*, shelduck *Tadorna tadorna*, teal *Annas crecca*, pintai *Anas acutal*, shoveler *Anas clypeata*, scaup *Aythya marila*, goldeneye *Bucephala clangula*, whooper swan *Cygnus cygnus*, oystercatcher Haematopus ostralegus, knot *Calidris canutus*, grey plover *Pluvialis squatarola*, dunlin *Calidris alpina*, sanderling *Calidris alba*, redshank Tringa totanus, turnstone *Arenaria interpres* and *curlew Numenius arquata* (SNH, undated).	distribution of the species and ability to use the site are maintained in the long-term; b) To maintain the habitats and food resources of the qualifying features in favourable condition.	scoped out at an early stage of HRA (SNH, 2016).
Cumbria Coast MCZ - 4.8 km south-west of the site	The MCZ designation protects the following features (DEFRA, 2019): ○ High energy intertidal rock; ○ Honeycomb worm *Sabellaria alveolate*; reefs; ○ Intertidal biogenic reefs; ○ Intertidal sand and muddy sand;	The general management approach is to maintain the protected features in favourable condition. Razorbill are to be recovered to favourable condition (DEFRA, 2019).	Most marine activity is already regulated by the relevant regulatory bodies. There are existing byelaws, national laws and European Regulations which regulators use to manage fishing, coastal development, recreation and pollution. These also apply in MCZs.

Designated Site	Features	Conservation Objectives	Site Condition /Vulnerabilities
	○ Intertidal under-boulder communities; ○ Moderate energy infralittoral rock; ○ Peat and clay exposures; and, ○ Razorbill *Alca torda*.		Regulators will manage each site according to the features and activities in, or near, a specific area. Management measures will be implemented at sites most at risk of damage first, regulating only those activities, which have a detrimental impact on the designated features. Any management measures that are required for MCZs will be applied on a case-by-case basis (DEFRA, 2019).
River Derwent and Bassenthwaite Lake SAC - 6.1 km north and 7.8 km east of the site.	Annex I habitats that are a primary reason for selection of this site (JNCC, 2015): ○ Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: ○ Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Annex II species that are a primary reason for selection of this site:	To ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: ○ The extent and distribution of qualifying natural habitats and habitats of qualifying species; ○ The structure and function (including typical species) of qualifying natural habitats;	The River Derwent and Tributaries SSSI (which underlies the SAC) comprises 29 units. 45% of SSSI units are favourable or unfavourable recovering Natural England, 2020). The Bassenthwaite Lake SSSI (which also underlies the SAC) comprises 11 units, 20.35% of which are favourable or unfavourable recovering (Natural England, 2020a). The site improvement plan for the SAC (Natural England, 2014) lists the following threats / pressures:

Designated Site	Features	Conservation Objectives	Site Condition /Vulnerabilities
	○ Marsh fritillary butterfly *Euphydryas aurinia*; ○ Sea lamprey *Petromyzon marinus*; ○ Brook lamprey *Lampetra planeri*; ○ River lamprey *Lampetra fluviatilis*; ○ Atlantic salmon *Salmo salar*; ○ Otter Lutra lutra; and, ○ Floating water-plantain *Luronium natans*.	○ The structure and function of the habitats of qualifying species; ○ The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; ○ The populations of qualifying species; and, ○ The distribution of qualifying species within the site (Natural England, 2018).	○ Water pollution; ○ Siltation; ○ Invasive species; ○ Physical modification; ○ Water abstraction; ○ Changes in species distribution; ○ Forestry and woodland management; ○ Fisheries; ○ Hydrological changes; and, ○ Air pollution.
River Ehen SAC - 10 km south -east of site	Annex II species that are a primary reason for selection of this site: ○ Freshwater pearl mussel *Margaritifera margaritifera*. Annex II species present as a qualifying feature, but not a primary reason for site selection: ○ Atlantic salmon (JNCC, 2015a).	To ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: ○ The extent and distribution of the habitats of qualifying species; ○ The structure and function of the habitats of qualifying species;	The River Ehen (Ennerdale Water to Keekle Confluence) SSSI, which underlies the SAC, comprises two units with conditions of Unfavourable – Declining (Natural England, 2020b). The site improvement plan for the SAC (Natural England, 2014a) lists the following threats / pressures:

Designated Site	Features	Conservation Objectives	Site Condition /Vulnerabilities
		○ The supporting processes on which the habitats of qualifying species rely; ○ The populations of qualifying species; and, ○ The distribution of qualifying species within the site (Natural England, 2018a & 2019).	○ Water abstraction (freshwater pearl mussel only); ○ Low breeding success/poor recruitment (freshwater mussel only); ○ Siltation; ○ Water pollution; ○ Inappropriate weirs, dams and other structures; ○ Agricultural management practices; ○ Invasive species; ○ Forestry and woodland management; ○ Public access/disturbance; and, ○ Transportation and service corridors.

Solway Flats and Marshes is not highlighted in the above table but is located within the ZoI. The reasons for this are presented within the citation for this designated site which states: *"This document provides Scottish Natural Heritage's (SNH) and Natural England's (NE) advice on the proposed extension to the existing Upper Solway Flats and Marshes Special Protection Area (SPA) in the marine waters of the "Solway Firth" for inshore non-breeding waterfowl and non-breeding gulls. The proposal includes a name change from the Upper Solway Flats and Marshes SPA to the Solway Firth proposed SPA to include the marine extension. From this point forward, the site will be referred to as the Solway Firth proposed SPA (pSPA)."*

5.0 Stage 1: Screening

This section considers the pathways of potential effects as a result of the proposed on-going operation of the wind farm and decommissioning works and assesses whether or not these pathways could result in a significant effect on qualifying features of the Natura 2000 sites listed in Section 4.0. Potential threats to the integrity of each Natura 2000 site have been listed above in Table 1.

The Habitats Regulations Assessment Handbook (DTA, 2020) confirms that during the Screening Stage, *"If significant effects cannot be excluded on the basis of objective information without extensive investigation, a plan or project should be considered to have a likely significant effect and taken through to an appropriate assessment*".

5.1 Is the Project Directly Connected with or Necessary to Site Management for Nature Conservation?

The project proposals are not connected with and are not necessary for the management of any internationally designated sites, although it does have the potential to affect them.

5.2 Threats / Pathways of Effect Potentially Likely to Arise during Continued Operation

With reference to SNH guidance on assessing the significance of impacts from onshore wind farms (SNH 2018), potential threats / pathways of effect are:

- Direct mortality or injury of birds from collision with turbine blades or towers;
- Loss of habitat due to wind farm infrastructure;
- Displacement of birds from designated site and functionally linked habitat within and surrounding the wind farm area; and
- Barrier effects if bird populations are prevented from reaching a destination due to wind farms acting as a barrier along the flight path.

5.3 Threats / Pathways of Effect Potentially Likely to Arise during Decommissioning

The following threats / pathways could occur during decommissioning:

- Noise and visual disturbance of during decommissioning works; and
- Pollution.

5.4 Assessment of LSEs - Operation

5.4.1 The Solway Firth pSPA

Direct mortality or injury of pSPA birds from collision with turbine blades or towers

Death of bird species through collision or interaction with turbine blades and other infrastructure is cited as one of the main potential risks to bird species (SNH 2017). Regular mortality events as a result of collision with the operational turbines on site have the potential to significantly reduce

population numbers of qualifying feature populations in the local area. Such reduction will adversely affect the favourable conservation status of qualifying features of the designated site.

Therefore, LSEs on this designated site as a result of this pathway of effect are anticipated.

Loss of habitat due to wind farm infrastructure

Continued operation of the wind farm (which will not involve any additional physical development) is located beyond the boundary of the designated site and therefore will not result in direct loss of habitat availability to support associated qualifying features. Nor is the continued operation of the wind farm considered likely to result in the direct loss of functionally linked habitat, which supports qualifying features associated with this designated site.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Displacement of pSPA birds from designated site and functionally linked habitat within and surrounding the wind farm area

Displacement effects (including those caused by noise and visual disturbance of the operational wind farm) of operational wind farms are known to be one of the main potential risks to bird species (SNH 2017). However, as part of its DAS (received on 26th September 2019), NE has confirmed that it considers displacement is unlikely to result in adverse effects upon the favourable conservation status of bird species associated with the designated site. This is due to the fact that turbines are set back from the coast and are not located near any key roosts, feeding areas, or nesting sites for qualifying features associated with this designated site.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Barrier effects if bird populations are prevented from reaching a destination due to wind farms acting as a barrier along the flight path.

WYG consulted NE regarding the scope of bird surveys necessary to inform the application. NE advised "*we have no concerns of any designated site impacts at Lowca, despite its proximity, as there is nothing that will attract the pSPA birds inland to cause flights through the site*" (Natural England, via email, 26th September 2020). Therefore, adverse effects upon the favourable conservation status of qualifying features of the designated site are considered highly unlikely.

Therefore, no LSE is anticipated as a result of this pathway of effect.

5.4.2 The Cumbria Coast MCZ

Direct mortality or injury of birds from collision with turbine blades or towers

Razorbill breed at St Bees Head, which is approximately 8.7 km south of the study area (Cumbria Naturalists Union, 2019). Due to the distance between the wind farm and the breeding site along with a lack of connectivity to foraging habitat between these sites it is considered highly unlikely that the operational wind farm will cause direct mortality to individual razorbills. Therefore, no adverse effect upon the favourable conservation status of this qualifying feature of the designated site is likely.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Loss of habitat due to wind farm infrastructure

The operational wind farm (which will not involve any additional physical development) will not result in any direct loss of habitats, which form qualifying features of this designated site. Nor will operation of the wind farm result in the loss of habitats or habitat features which support qualifying features of the designated site. It is therefore considered that favourable conservation status of qualifying features of this designated site will not be affected as a result of this impact pathway.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Displacement of birds from designated site and functionally linked habitat within and surrounding the wind farm area

Razorbill breed at St Bees Head, which is approximately 8.7 km south of the study area (Cumbria Naturalists Union, 2019). The operational wind farm will not result in the direct or indirect loss of suitable breeding habitat for razorbills. Nor will the operational wind farm adversely affect functionally linked habitat associated with this designated site. Adverse effects upon the favourable conservation status of this qualifying feature as a result displacement is considered highly unlikely.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Barrier effects if bird populations are prevented from reaching a destination due to wind farms acting as a barrier along the flight path.

WYG consulted NE regarding the scope of bird surveys necessary to inform the application. NE advised "*we have no concerns of any designated site impacts at Lowca, despite its proximity, as there is nothing that will attract the pSPA birds inland to cause flights through the site*" (Natural England, via email, 26th September 2020). Therefore, adverse effects upon the favourable conservation status of qualifying features of the designated site are considered highly unlikely.

Therefore, no LSE is anticipated as a result of this pathway of effect.

5.4.3 River Derwent and Bassenthwaite Lake SAC

Bird species do not form qualifying features of this designated site, therefore potential effect pathways associated with the effects upon bird species are not considered in relation to this designated site.

Loss of habitat due to wind farm infrastructure

The River Derwent and Bassenthwaite Lake SAC is 6.1km north of the study area at its closest point. The operational wind farm (which will not involve any additional physical development) will not result in the direct or indirect loss of habitat which forms or supports qualifying features of this designated site. Therefore, no adverse effects upon the favourable conservation status of qualifying features of this designated site are anticipated.

Therefore, no LSE is anticipated as a result of this pathway of effect.

5.4.4 River Ehen SAC

Bird species do not form qualifying features of this designated site, therefore potential effect pathways associated with the effects upon bird species are not considered in relation to this designated site.

Loss of habitat due to wind farm infrastructure

The River Ehen SAC is 10 km south-east of the study area. The operational wind farm (which will not involve any additional physical development) will not result in the direct or indirect loss of habitat which forms or supports qualifying features of this designated site. Therefore, no adverse effects upon the favourable conservation status of qualifying features of this designated site are anticipated.

Therefore, no LSE is anticipated as a result of this pathway of effect.

5.5 Assessment of LSEs - Decommissioning

5.5.1 The Solway Firth pSPA

Noise and visual disturbance of birds during decommissioning works.

The Solway Firth pSPA is designated for its assemblage of non-breeding birds. A detailed decommissioning schedule has not been prepared at this stage. However, the initial review of decommissioning and restoration requirements and costs at Askam and Park House Farm wind farms by BVG Associates (2019) indicates that works would take place over a 12-month period from cessation of energy production. Works are therefore considered likely to take place during the winter period when qualifying features associated with this site are present. Some temporary noise and visual disturbance during decommissioning could cause minor disturbance to the pSPA qualifying species. However, due to the availability of suitable habitat in the wider area, this is unlikely to have an effect on the favourable conservation status of qualifying species of this designated site.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Pollution

There are hydrological links between the study area and coastal habitats to the west in the form of the watercourses, which flow through the study area. In the absence of mitigation, a pollution event within the study area could affect the coastal habitats, which support the qualifying species of the pSPA. Therefore, adverse effects upon the favourable conservation status of qualifying features of the designated site are considered likely.

Therefore, LSE is anticipated as a result of this pathway of effect.

5.5.2 The Cumbria Coast MCZ

Noise and visual disturbance during decommissioning works

A breeding population of razorbill forms a qualifying feature of the designated site. A detailed decommissioning schedule has not been prepared at this stage. However, the initial review of decommissioning and restoration requirements and costs at Askam and Park House Farm wind farms by BVG Associates (2019) indicates that works would take place over a 12-month period from cessation of energy production. Works are therefore considered likely to take place during the bird breeding season period (March – August) when qualifying features associated with this designated site are present. Due to the distance between the wind farm and breeding colony of razorbill along with a lack of connectivity to foraging habitat between these sites it is considered highly unlikely that the decommissioning works will adversely affect the favourable conservation status of this qualifying feature as a result of noise and visual disturbance.

Therefore, no LSE is anticipated as a result of this pathway of effect.

Pollution

The Cumbria Coast MCZ is 4.8 km south-west of the study area and covers an area of 45 km^2. Due to the separation distances between the study area and the MCZ, it is considered unlikely that a pollution event would adversely affect species or habitats, which form qualifying features of the designated site.

Therefore, no LSE is anticipated as a result of this pathway of effect.

5.5.3 River Derwent and Bassenthwaite Lake SAC

Noise and visual disturbance during decommissioning works

The River Derwent and Bassenthwaite Lake SAC is 6.1 km north of the study area at its closest point. Due to the distance between the wind farm and this designated site it is considered highly unlikely that noise and visual disturbance will adversely affect the favourable conservation status of qualifying features of this designated site.

Therefore, LSEs as a result of this pathway are not anticipated.

Pollution

The River Derwent and Bassenthwaite Lake SAC is 6.1 km north of the study area at its closest point. There are hydrological links between the study area and the SAC via the coast. The Port of Workington is 6 km north of the study area and it is possible that the qualifying species (otter and fish) use the marine and coastal habitats between the SAC and the study area. The SAC is upstream of the study area and due to the coastal separation distances between the study area and the SAC; it is considered unlikely that a pollution event would adversely effect the favourable conservation status of qualifying features of this designated site.

Therefore, LSEs as a result of this pathway are not anticipated.

5.5.4 River Ehen SAC

Noise and visual disturbance during decommissioning works

The River Ehen SAC is 10 km north of the wind farm at its closest point. Due to the distance between the wind farm and this designated site it is considered highly unlikely that noise and visual disturbance will adversely affect the favourable conservation status of qualifying features of this designated site.

Therefore, LSEs as a result of this pathway are not anticipated.

Pollution

The closest part of the River Ehen SAC is 10 km south-east of the study area and the mouth of the river Ehen is approximately 20 km south of the study area along the coast. The SAC is upstream of the study area and due to the separation distances between the study area and the SAC; it is considered unlikely that a pollution event would adversely effect the favourable conservation status of qualifying features of this designated site.

Therefore, LSEs as a result of this pathway are not anticipated.

5.6 Summary of LSEs

Table 2 summarises the aspects of the proposed scheme that could result in LSE on the qualifying features of the designated sites as a result of the proposed development, alone. Cells shaded in green have concluded no LSE and cells shaded in amber indicate that the pathways should be considered further at AA.

Table 2 Summary of LSEs

Aspect of Project Assessed	Qualifying Features and supporting habitats/species	Pathway(s) of Effect	LSE Anticipated?	AA Required?
Solway Firth pSPA				
Continuing operation of wind farm.	The proposed marine features are: • Common scoter (non-breeding); 1590 individuals representing 2% of GB population; • Goosander (non-breeding), 150 individuals representing 1% of GB population; • Red throated diver (non-breeding); 530 individuals representing 3% of GB population. Proposed additional SPA review features: • Lapwing (non-breeding); 5040 individuals representing 1% of GB population; • Ringed plover (non-breeding) 980 individuals representing 1% of GB population; • Cormorant (non-breeding) 580 individuals representing 2% of the GB population; • Black-headed gull (non-breeding) 13,730 individuals representing 1 % of GB population; • Common gull (non-breeding) 12,490 individuals representing 2% of GB population; • Herring Gull (non-breeding) 3030 individuals representing 0.4% of the GB population. Additional features of the Upper Solway Flats and Marshes SPA are non-breeding: barnacle goose, golden plover, bar-tailed godwit, pink footed goose, shelduck, teal, pintail, shoveler, scaup, goldeneye, whooper swan, oystercatcher, knot, grey plover, dunlin, sanderling, redshank, turnstone and curlew.	• Direct mortality or injury of birds from collision with turbine blades or towers.	Yes	Yes
		• Loss of habitat due to wind farm infrastructure.	No	No
		• Displacement of birds from the wind farm area (and potentially a wider zone surrounding the wind farm).	No	No
		• Barrier effects - bird populations prevented from reaching a destination due to wind farms acting as a barrier along the flight path.	No	No
Decommissioning of wind farm.	Qualifying features as listed above.	• Noise and visual disturbance	No	No
		• Pollution	Yes	Yes
The Cumbria Coast MCZ				
Continuing operation of wind farm.	The MCZ designation protects the following features: • High energy intertidal rock; • Honeycomb worm reefs, • Intertidal biogenic reefs; • Intertidal sand and muddy sand; • Intertidal underboulder communities; • Moderate energy infralittoral rock; • Peat and clay exposures; and, • Razorbill.	• Habitat degradation habitat loss; • Direct mortality or injury of birds from collision with turbine blades or towers; • Displacement of birds; • Barrier effects.	No	No
			No	No
Decommissioning of wind farm.	Qualifying features as listed above.	• Noise and visual disturbance	No	No
		• Pollution	No	No
River Derwent and Bassenthwaite Lake SAC				
Continuing operation of the wind farm.	Annex I habitats that are a primary reason for selection of this site: • Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.	• No pathways of effect identified.	No	No

	Annex II species that are a primary reason for selection of this site: • Marsh fritillary butterfly; • Sea lamprey; • Brook lamprey; • River lamprey; • Atlantic salmon; • Otter; and, • Floating water-plantain.			
Decommissioning of the wind farm	Qualifying features as listed above.	• Noise and visual disturbance during decommissioning works Pollution	No	No
River Ehen SAC				
Continuing operation of the wind farm.	Annex II species that are a primary reason for selection of this site: • Freshwater pearl mussel. Annex II species present as a qualifying feature, but not a primary reason for site selection: • Atlantic salmon.	• N/A	No	No
Decommissioning of the wind farm	Qualifying features as listed above.	• Noise and visual disturbance during decommissioning works	No	No
		• Pollution	No	No

6.0 Consideration of In-combination Effects

In-combination effects can be defined as the additional changes caused by a proposed development in conjunction with other similar developments, or as a combined set of developments, taken together (SNH, 2012).

In this section, the potential for LSE in-combination with other plans and projects is considered with reference to the potential pathways where LSEs are possible, i.e.:

- Direct mortality or injury of pSPA birds from collision with turbine blades or towers;
- Loss of habitat due to wind farm infrastructure;
- Displacement of pSPA birds from the wind farm area (or a potentially wider zone surrounding the wind farm);
- Barrier effects whereby pSPA bird populations are prevented from reaching a destination due to wind farms acting as a barrier along the flight path.

The in-combination assessment is restricted to plans and projects, which are 'live' at the same, time as this assessment being undertaken and include:

- Incomplete or non-implemented projects already commissioned;
- Plans/projects with consent but not started;
- Plans/projects subject to application for consent;
- Projects under appeal;
- On-going plans/projects subject to regular review;
- Draft plans by Local Planning Authorities (LPA's);
- Any proposed plans/projects that are reasonably foreseeable and/or published for consultation prior to application.

6.1.1 Projects

Wind Energy Developments

A search of the Allerdale Borough Council and Copeland Borough Council Planning Portals was completed to identify planning applications within 10 km of the study area with the potential to have in-combination effects. Table 3 summarises the wind farm developments / turbines were identified within 10 km of the study area. The locations of the developments are shown in Figure 4.

Table 3: Data from cumulative wind database, which includes turbines 15m, and above that are consented or awaiting determination

Planning Application Number	Name	LPA	Status	Potential for in-combination effects?
2/2010/0533	Lucy Close	Allerdale	Consented	No – No HRA produced in support of this project however ecological information submitted to support this planning application indicates that relevant designated sites will not be affected by the proposed development, therefore this

Planning Application Number	Name	LPA	Status	Potential for in-combination effects?
				project is unlikely to act in-combination with Park House Farm wind farm.
2/2010/0530	Outgang Farm	Allerdale	Consented	No – No HRA produced in support of this project however ecological information submitted to support this planning application indicates that relevant designated sites will not be affected by the proposed development, therefore this project is unlikely to act in-combination with Park House Farm wind farm.
4/14/9005/0F2	Arelecdon Wastewater Treatment Works	Copeland	Consented	No – No ecological information submitted to support the planning application. No designated sites considered likely to be affected by this project therefore this project is unlikely to act in-combination with Park House Farm wind farm.
4/15/2187/0F1	High Farm	Copeland	Consented	No - No HRA produced in support of this project however ecological information submitted to support this planning application indicates that relevant designated sites will not be affected by the proposed development therefore this project is unlikely to act in-combination with Park House Farm wind farm.

Other Developments

In addition to the above wind farm developments, a list of other developments, which have the potential to act in-combination, are provided in Appendix C. These are primarily residential or commercial developments, which cumulatively could result in the loss of habitat. The locations of the planning applications are shown in Figure 5.

Key developments identified in close proximity to the study area are:

Planning Application 4/06/2013/0 – Land at Micklam, Lowca

The Environmental Statement (White Young Green 2006) for this project indicates that there are no internationally designated sites within the ZOI of this project. **It is therefore considered that LSE are not anticipated in-combination with this project.**

Planning Application 4/20/2022/0F1 – Land to the North of Woodland Nurseries, Stamford Hill, Lowca

The Ecological Impact Assessment (Open Space Ecology and Habitat Solutions 2019) for this project determines that there are no internationally designated sites within the ZOI of this project. **It is therefore considered that LSE are not anticipated in-combination with this project.**

Table 4 below summarises the LSE, which could occur in-combination with other plans or projects.

6.1.2 Plans

Allerdale Local Plan

The 'Allerdale Borough Council - Local Plan Habitats Regulations Assessment Amended' (WYG 2013) states that *"there is scope for there to be indirect effects on qualifying species and habitats of the Solway Firth and the River Derwent and Bassenthwaite Lake Natura 2000 sites. These developments are not in themselves considered likely to result in an adverse significant effect on the integrity of the sites alone, but there is potential for 'coastal squeeze' and cumulative effects as a result of the combination of other plans and policies, sea level and climate change along the west Cumbrian coast resulting in a lack of high tide roost and foraging areas for SPA birds from the Solway Firth. This would not only be as a result of land lost to employment but also to wind farm schemes along the coast."* In addition, this HRA states that *"The extent of wind power development along the Cumbrian coast in recent years and future potential developments close to areas such as the Solway Firth SPA/Ramsar render assessment of potential cumulative impact particularly on birds, but also bats, complicated. The potential for likely significant cumulative effects through the promotion of future wind farm development cannot be easily ruled out so this policy has been carried forward into the more detailed appropriate assessment."*

It is therefore considered that LSE are anticipated in-combination with the Allerdale Local Plan.

Copeland Local Plan

The Habitats Regulations Assessment Screening Report (Copeland Borough Council 2012) produced to inform the Core Strategy for Copeland Borough does not take into consideration potential effects of the core strategy upon Solway Firth pSPA or the Cumbria Coast MCZ. The potential increase in pollution to River Derwent and Bassenthwaite Lake SAC and River Ehen as a result in increased traffic levels is highlighted. However, the screening report concludes that LSE are not anticipated as a result of the Core Strategy at the time of writing.

It is therefore considered that LSE, are not anticipated in-combination with the Copeland Local Plan.

However, the HRA screening report goes on to note that further assessment would be required upon review of site allocations. At the time of writing this assessment, scoping of allocations by Copeland Borough Council was not complete and is therefore not considered further.

Cumbria Wind Energy Supplementary Planning Document (SPD)

Cumbria County Council published a Supplementary Planning Document (SPD) dealing with onshore wind energy (Cumbria County Council, 2017). The SPD produced by Cumbria County Council was

formally adopted by the LPAs in Allerdale, Carlisle, Copeland, Eden, South Lakeland and the Lake District National Park. The supplementary policies contained within it provide guidance for developers putting together development proposals for wind energy generation. This document contains guidance only and does not carry the status of an adopted Local Plan document.

The 'Habitats Regulations Assessment Cumbria Wind Energy Supplementary Planning Document' (Allerdale Borough Council et al 2007) states:

"It was concluded that significant effects could be possible for any European site in Cumbria for the following reasons:

- In order to demonstrate no LSE, alone and in combination, an assessment would need to be carried out on a site by site basis as wind energy proposals come forward. It is only at this stage that the necessary details of the location and characteristics of a scheme will be known and information on the proximity of a wind energy site to a European site would be established along with any potential effects on habitats and species associated with the European site.
- Although there is some text in the draft SPD referring to the need for developers to carry out an assessment on nature conservation interests it does not refer to the need for a Habitats Regulations Assessment to be carried out in accordance with the Habitats Regulations 1994.

Although the SPD is not site specific it seeks to support wind energy development that by its nature could cause LSE to habitats and associated species for the reasons set out above."

In order to demonstrate no LSE, alone and in-combination, an assessment would need to be carried out on a site by site basis as wind energy proposals come forward. It is only at this stage that the necessary details of the location and characteristics of a scheme will be known and information on the proximity of a wind energy site to a European site would be established along with any potential effects on habitats and species associated with the European site.

Although there is some text in the draft SPD referring to the need for developers to carry out an assessment on nature conservation interests it does not refer to the need for a Habitats Regulations Assessment to be carried out in accordance with the Habitats Regulations 1994.

As concluded above, in order to ascertain that wind energy schemes, alone and in-combination, will not have an adverse effect on the integrity of a European site or feature a Habitats Regulations Assessment would need to be carried out on a site by site basis as wind energy proposals come forward."

It is therefore not possible to conclude at this stage that LSE can be screened out, when the project is taken into consideration in-combination with this supplementary planning document.

Table 4: Summary of In-Combination Effects

Aspect of Project Assessed	Qualifying Features and supporting habitats/species	Pathway(s) of Effect	Assessment of LSEs in-Combination - projects	Assessment of LSEs in-Combination - plans	AA Required?
Solway Firth pSPA					
Continuing operation of wind farm.	The proposed marine features are: ○ Common scoter (non-breeding); 1590 individuals representing 2% of GB population; ○ Goosander (non-breeding), 150 individuals representing 1% of GB population; ○ Red throated diver (non-breeding); 530 individuals representing 3% of GB population. Proposed additional SPA review features: ○ Lapwing (non-breeding); 5040 individuals	Direct mortality or injury of birds from collision with turbine blades or towers. Loss of habitat due to wind farm infrastructure. Displacement of birds from the wind farm area (and potentially a wider zone surrounding the wind farm). Barrier effects - bird populations prevented from reaching a destination due to wind farms acting as a barrier along the flight path.	Review of planning applications for wind farm and non-wind farm projects included for in-combination assessment determines that this designated site and associated qualifying features are not within the ZOI for such projects and so are unlikely to be affected by other relevant wind farm projects. This is confirmed in relation to wind energy projects via written consultation with Natural England in respect of each planning application. NE discretionary Advice Service does not appear in planning application documentation for non-wind projects. Therefore, when the study area is considered in-combination with relevant	Review of relevant evidence base documents for the Allerdale Local Plan and Cumbria Wind Energy SPD identifies potential for LSE and the requirement for further assessment. Therefore, when the study area is considered in-combination with Allerdale Local Plan and Cumbria Wind Energy SPD, LSE are **anticipated**.	Yes- Allerdale local plan and Cumbria wind SPD only

	representing 1% of GB population; ○ Ringed plover (non-breeding) 980 individuals representing 1% of GB population; ○ Cormorant (non-breeding) 580 individuals representing 2% of the GB population; ○ Black-headed gull (non-breeding) 13,730 individuals representing 1 % of GB population; ○ Common gull (non-breeding) 12,490 individuals representing 2% of GB population; ○ Herring Gull (non-breeding) 3030 individuals representing 0.4% of the GB population. Existing qualifying features of the SPA		projects, LSE are **not anticipated**.		

	are non-breeding: barnacle goose, golden plover, bar-tailed godwit, pink footed goose, shelduck, teal, pintail, shoveler, scaup, goldeneye, whooper swan, oystercatcher, knot, grey plover, dunlin, sanderling, redshank, turnstone and curlew.				
Decommissioning of wind farm.	Qualifying features as listed above.	Noise and visual disturbance			
		Pollution			
The Cumbria Coast MCZ					
Continuing operation of wind farm.	The MCZ designation protects the following features: ○ High energy intertidal rock; ○ Honeycomb worm; reefs, ○ Intertidal biogenic reefs; ○ Intertidal sand and muddy sand;	Changes to habitats: ○ Habitat loss; ○ Habitat degradation.	The operational wind farm will not have any effects upon the qualifying habitats of the MCZ alone or in-combination with other plans or projects due to the separation distance between the study area and the MCZ.	The operational wind farm will not have any effects upon the qualifying habitats of the MCZ alone or in-combination with other plans due to the separation distance between the study area and the MCZ. Therefore, when considered in-combination with the study area, LSEs are **not anticipated**.	No
		○ Direct mortality or injury of birds from collision with turbine	Razorbill breeds around the coast of the UK, including St Bees Head. The future of this species is linked to the health		No

	○ Intertidal under-boulder communities; ○ Moderate energy infralittoral rock; ○ Peat and clay exposures; and, Razorbill.	blades or towers; ○ Displacement of birds; ○ Barrier effects.	of the marine environment. Fishing nets, pollution and declining fish stocks all threaten the razorbill. The operational wind farm is unlikely to have any effects upon razorbill either alone or in-combination with other plans or projects.		
Decommissioning of wind farm.	Qualifying features as listed above.	Noise and visual disturbance	The Cumbria Coast MCZ is 4.8 km south-west of the study area and covers an area of 45 km^2. Due to the separation distances between the study area and the MCZ, it is considered unlikely noise of visual disturbance would have a LSE upon the qualifying bird species (razorbill) either alone or in-combination.		No
		Pollution	The Cumbria Coast MCZ is 4.8 km south-west of the study area and covers an area of 45 km^2. Due to the separation distances between the study area and the MCZ, and the likely dilution effects from the sea, it is considered unlikely that a pollution event would have a LSE upon the qualifying habitats or species associated		No

			with the MCZ either alone or in-combination.		
River Derwent and Bassenthwaite Lake SAC					
Continuing operation of the wind farm.	Annex I habitats that are a primary reason for selection of this site: Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea.* Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.	No pathways of effect identified.	The river Derwent and Bassenthwaite Lake SAC is 6.1km north of the study area at its closest point. Due to the separation distances between the SAC and the study area, there are unlikely to be any LSE on the qualifying habitats or species of the SAC. No LSE are anticipated alone or in-combination with other plans or projects.	Not applicable. No impact pathway identified within relevant local plans/SPD docs which could act in-combination with the effects of the study area. Therefore, when the study area is considered in-combination with Allerdale Local Plan and Cumbria Wind Energy SPD, LSE are **not anticipated.**	No

	Annex II species that are a primary reason for selection of this site: ○ Marsh fritillary butterfly; ○ Sea lamprey; ○ Brook lamprey; ○ River lamprey; ○ Atlantic salmon; ○ Otter; and, ○ Floating water-plantain.				
Decommissioning of the wind farm	Qualifying features as listed above.	Pollution	The river Derwent and Bassenthwaite Lake SAC is 6.1km north of the study area at its closest point. Due to the separation distances between the SAC and the study area, there are unlikely to be any LSE on the qualifying habitats or species of the SAC either alone or in-combination.	The HRA for Allerdale Local Plan (WYG 2012) highlights pollution as a potential impact pathway which may result in LSE. However, given the distance of the study area to this designated site it is considered unlikely that this impact pathway will act in-combination with this local plan. Therefore, when the study area is considered in-combination with Allerdale Local Plan and Cumbria Wind Energy SPD, LSE are **not anticipated**.	No
River Ehen SAC					

Continuing operation of the wind farm.	Annex II species that are a primary reason for selection of this site: ○ Freshwater pearl mussel. Annex II species present as a qualifying feature, but not a primary reason for site selection: ○ Atlantic salmon.	N/A	The River Ehen SAC is 10 km south-east of the study area. There are no pathways of effect between the study area and the SAC and no LSE are anticipated alone or in-combination during operation.	The HRA for Allerdale Local Plan (WYG 2012) states that the LSE are not anticipated as a result of the local plan. Copeland Local Plan and Cumbria Wind Energy SPD are not considered relevant to this designated study area. Therefore, when the study area is considered in-combination with the relevant Local Plan, LSE are **not anticipated during operation and decomissioning phase**.	No
Decommissioning of the wind farm	Qualifying features as listed above.	Pollution	The River Ehen SAC is 10 km south-east of the study area. The SAC is upstream of the study area and due to the separation distances between the study area and the SAC, it is considered unlikely that a pollution event would have a LSE upon the qualifying habitats or species associated with the SAC, either alone or in-combination.		No

7.0 Summary – Stage 1

Using a precautionary approach, this assessment has concluded that LSE on qualifying interest features associated with the pSPA Solway Firth **are anticipated alone and in-combination (with relevant plans only).**

As such, the 'Competent Authority', in consultation with Natural England is considered likely to require further assessment under the Habitats Regulations in order to determine if this project can proceed without any adverse effects on the integrity of the internationally designated sites within 10 km of the study area.

8.0 Information to Inform an Appropriate Assessment

The above Stage 1 assessment has determined that LSE as a result of the continuing operation and decommissioning of the wind farm are anticipated at the Solway Firth pSPA as a result of:

- Increased mortality of pSPA populations (during the operation phase); and
- Potential pollution events (during the decommissioning phase).

Therefore, this section of the report to inform HRA Stage 2 only discusses the impacts of these impact pathways.

It is recognised that the qualifying features of the designated sites included within this assessment include breeding, wintering and passage bird species and assemblages along with the functionally linked habitat which supports these features.

To inform this AA, vantage point bird surveys were undertaken from 2019 to 2020. Detailed results are presented within the Park House Farm Wind Farm Bird Vantage Point Survey Report (WYG, 2020).

The Stage 1 assessment also concluded that LSE may occur in-combination with Allerdale Local Plan and Cumbria wind SPD only. Therefore a detailed review of relevant policies and the HRA documents included within the Evidence Base for relevant plans has been undertaken to inform this report.

8.1 Non-breeding bird populations designated under the Solway Firth pSPA

A summary of bird species recorded on or flying through the study area which form qualifying features of the above designated sites is provided in table 5.

Table 5 Comparison between non-breeding bird survey data and the Solway Firth pSPA designated site qualifying feature survey data.

Species Name	Qualifying feature population status (mean peak population for specified years)	Peak recorded within the study area during surveys	Surveys % of the qualifying feature on site	Total flights recorded during surveys	Total time recorded flying within study area during surveys (h:m:s)	% of flights recorded at rotor collision risk height
Black-headed gull	Article 4.2: regularly supporting in excess of 20,000 waterbirds, nationally important non-breeding populations. 13,732 birds, 0.6% of GB population (2003/04 – 2005/06). 2nd largest non-breeding population in Scotland.	150	1.09%	935	23:16:30	61.94%
Herring gull	Article 4.2: regularly supporting in excess of 20,000 waterbirds, nationally important non-breeding populations. 3,034 birds, 0.4% of GB population (2003/04 – 2005/06). 2nd largest non-breeding population in Scotland.	40	1.31%	667	11:24:45	57.76%

Species Name	Qualifying feature population status (mean peak population for specified years)	Peak recorded within the study area during surveys	Surveys % of the qualifying feature on site	Total flights recorded during surveys	Total time recorded flying within study area during surveys (h:m:s)	% of flights recorded at rotor collision risk height
Curlew	Article 4.2: regularly supporting populations of European importance of migratory species. 6,700 birds, 7% of GB population (1986/87 – 1990/91).	40	<1%	326	03:57:00	37.24%
Pink-footed goose	Article 4.2: regularly supporting populations of European importance of migratory species. 14,900 birds, 14% of the Icelandic population, all of which winter in Britain (1986/87 – 1990/91).	120	<1%	231	03:39:30	31.32%
Cormorant	Article 4.2: regularly supporting in excess of 20,000 waterbirds, nationally important non-breeding populations.	-	-	201	04:18:15	22.17%

Species Name	Qualifying feature population status (mean peak population for specified years)	Peak recorded within the study area during surveys	Surveys % of the qualifying feature on site	Total flights recorded during surveys	Total time recorded flying within study area during surveys (h:m:s)	% of flights recorded at rotor collision risk height
	581 individuals, 1.6% of GB population (2007/8 – 2011/12). 7th largest non-breeding population in GB.					
Common gull	Article 4.2: regularly supporting in excess of 20,000 waterbirds, nationally important non-breeding populations. 12,486 individuals, 1.8% of GB population (2003/04 – 2005/06). 2nd largest non-breeding population in Scotland.	-	<1%	71	02:20:30	90.75%

Species Name	Qualifying feature population status (mean peak population for specified years)	Peak recorded within the study area during surveys	Surveys % of the qualifying feature on site	Total flights recorded during surveys	Total time recorded flying within study area during surveys (h:m:s)	% of flights recorded at rotor collision risk height
Lapwing	Article 4.2: regularly supporting in excess of 20,000 waterbirds, nationally important non-breeding populations. 5,037 individuals, 0.8% of GB population (2007/08 – 2011/12).	-	<1%	14	00:09:30	21.05%
Redshank	Article 4.2: regularly supporting populations of European importance of migratory species. 2,100 individuals, 3% of the GB population, 2% of east Atlantic flyway (1986/87 – 1990/91).	-	<1%	9	00:09:00	20%
Common scoter	Article 4.2: regularly supporting in excess of 20,000 waterbirds,	-	<1%	6	00:12:00	0%

Species Name	Qualifying feature population status (mean peak population for specified years)	Peak recorded within the study area during surveys	Surveys % of the qualifying feature on site	Total flights recorded during surveys	Total time recorded flying within study area during surveys (h:m:s)	% of flights recorded at rotor collision risk height
	nationally important non-breeding populations. 1,588 individuals, 1.6% GB population (2001/02 – 2005/06).					
Goosander	Article 4.2: regularly supporting in excess of 20,000 waterbirds, nationally important non-breeding populations. 146 individuals, 1.6% of GB population (2007/08 – 2011/12). Largest marine population in GB.	2	1.37%	2	00:06:00	100%

Black-headed gull and herring gull (designated as qualifying features under the Solway Firth pSPA for their nationally important non-breeding populates) have been recorded within the study area or within 1km of the turbines at levels exceeding 1% of the current pSPA. Therefore, these species require further assessment as the mortality resulting from the collision with the wind farm infrastructure may contribute to the significant increase (more than 1%) in baseline mortality for the pSPA populations of the above species.

Other bird species which form qualifying features of the designated site were recorded during surveys. However, these were recorded at a density below 1% of the pSPA population and do not therefore meet the threshold to be considered of international importance and are therefore not discussed further in this report.

8.2 Confirmation of designated sites and features to include

Based on the above information the designated sites and qualifying features considered relevant to AA are presented in table 6. All other designated sites and qualifying features are excluded from this assessment.

Table 6: summary of relevant designated sites and features to consider in HRA Stage 2 AA.

Designated site	Qualifying feature	Operation Phase Impact pathway – in isolation	Decommission Phase Impact pathway- in isolation	In-combination assessment
The Solway Firth pSPA	Black-headed gull Herring gull	Direct mortality or injury of birds from collision with turbine blades or towers.	Pollution of habitat supporting qualifying features during decommissioning works.	Plans only

8.3 Assessment of Effects

The Stage 1 HRA considers potential for effects of the study area alone and in-combination with other relevant plans and projects without mitigation. However, at the HRA Stage 2 Appropriate Assessment (AA) stage any appropriate mitigation adopted can be considered in the assessment to avoid or prevent LSEs/ effects on the integrity of Natura 2000 sites.

8.3.1 Direct mortality or injury of birds from collision with turbine blades or towers.

Black headed gulls and herring gulls were observed flying frequently near the wind turbines with significant proportion of flights recorded at the potential rotor collision height (61.94% for black-headed gull and 57.40% for herring gull).

The maximum number of birds recorded during the surveys at one time comprised 150 birds for black-headed gull and 40 birds for herring gull. This represents 1.09% and 1.31% respectively of the Solway Firth pSPA populations for these species. As the number of birds exceeds 1% of the pSPA

baseline populations there is a risk the mortality resulting from the collision with the wind farm infrastructure may contribute to the significant increase (more than 1%) in baseline mortality for the pSPA populations of the above species. The maximum annual baseline mortality of black-headed gull and herring gull Solway Firth pSPA populations is considered to be 1,373.2 and 324.6 respectively (see table 7).

In order to calculate the potential number of bird collisions likely to occur at the Park House Farm wind farm and hence the potential mortality which may be caused by the Park House Farm wind farm, the Band Model was applied (SNH, 2010; Band et al. 2007). The model calculates the rate of collision by taking flight activity, bird size and speed, and turbine size and speed and then it applies the collision avoidance rate which varies for different bird species.

Gull species have one of the highest wind turbine avoidance rates (0.995 for large gulls and 0.992 for small gull species) (Furness, 2019).

In order to calculate the collision risk at the Park House Farm wind farm for black-headed gull and herring gull, the flight data for the non-breeding period (September - February) for the 2019 – 2020 season was used. Only flight lines overlapping with the potential impact zone the wind farm (200m radius area around each turbine) were considered for these calculations; the avoidance rate of 0.992 was assumed for black-headed gull and 0.995 for herring gull. Detailed maps depicting bird flight lines and bird activity results have been included in the Bird Vantage Point Survey Report (WYG, 2020).

Table 7 presents collision risk modelling results for black-headed gull and herring gull at Park House Farm wind farm.

Table 7 Collision Risk Modelling Data for Park House Farm wind farm

Common Name	Total time recorded within 200m radius zone (s)	Total time at potential collision height (s)	Avoidance rate	Estimated no. of collision per year with no avoidance	Estimated no. of collision per year after allowing for avoidance	Equivalent of one bird collision every x years	Estimated total collisions for the operational period of the windfarm (2020 – 2030)	Percentage of qualifying feature affected during operational period of the windfarm, (2020-2030)
Black-headed gull	13800	7485	0.992	71.23	0.57	One bird every 1.75 years	5.7	0.04
Herring gull	18900	14820	0.995	189.97	0.95	One bird every 1.05 years	9.5	0.14

Based on the above assessment it is considered that the effects of collision with structures within the wind farm will be significantly lower than the 1% population threshold to be determined significant during all years of operation. It is therefore highly unlikely that continued operation of the wind farm study area will result in any significant adverse effects upon the favourable conservation status of relevant qualifying features of the Solway Firth pSPA.

Therefore, it is considered that there will no risk of adverse effects on the integrity of relevant designated site as a result of this impact pathway and no mitigation is required.

8.3.2 Pollution

The decommissioning phase of the study area carries the risk of causing pollution events as a result of chemical or fuel spill within designated site via hydrological connections.

Such pollution events have the potential to result in direct injury or mortality to bird species which form qualifying features of Solway Firth pSPA (i.e. should birds become coated within or ingest petrochemicals spill). Such spills may also reduce the availability of prey items within the designated site in close proximity to the study area. Such negative effects have the potential to adversely affect the integrity of the designated site and the favourable conservation status of relevant qualifying features as noted above.

At the time of writing this assessment, no detailed mitigation has been produced. However, in line with the relevant planning condition (Condition 2) attached to the consent for this project (which would be reinstated upon approval of the extension of life for this project) detailed mitigation measures would be produced at the end of the project life (in approximately 10 years time). Details regarding likely best practice standards can not be predicted at this time however, however it is considered that a Construction and Environmental Management Plan (CEMP) or similar document will be produced for the study area. The principals of such a CEMP will incorporate mitigation measures designed to avoid and or minimise the risk of pollution event as a result of spillage. Such measures will include:

- Avoidance of use of diesel or petrol-powered generators through using mains electricity or battery powered equipment;
- Appropriate COSHH and fuel storage facilities (bunded);
- Robust spillage procedures and sufficient clean up equipment available on site to promptly address any spillages;
- The use of biodegradable oils in plant working near water.

Providing the measures designed within the CEMP for the study area are applied, it is considered that there will be no risk of adverse effects on the integrity of relevant designated site as a result of pollution effects.

8.4 In-combination

Stage 1 of this assessment determined that when the study area is considered in-combination with Allerdale Local Plan and Cumbria wind SPD then LSE is anticipated. However, the emphasis within relevant sections of relevant local plans included in stage 2 assessment is to undertake HRA assessment on land allocated for wind farm development on a project by project basis.

The in-combination assessment of wind farm projects relevant to the study area has concluded that LSE is not anticipated. In addition, the measures described within the CEMP conclude that integrity of relevant designated site will not be affected.

It is therefore considered highly unlikely that, when the study area is taken into consideration in-combination with relevant local plans/supplementary planning documents, there are any appreciable or discernible adverse effects upon the designated site.

8.5 Conclusion

It is recognised that, in the absence of inbuilt and additional mitigation, there is potential for adverse effects upon the favourable conservation status of qualifying features and the integrity of the Solway Firth pSPA associated with the proposed decommissioning of the development.

However, the CEMP provides measures to prevent any adverse effects upon qualifying features of the Solway Firth pSPA or functionally linked land which support such features during the decommission phases of the proposed development.

As such it is considered that the identified impact pathways are unlikely to have any appreciable or discernible effect upon the designated site when the study area is considered in isolation or in combination with Allerdale Local Plan and Cumbria wind SPD.

It is therefore considered that no further assessment is required in relation to this project when considered in isolation.

9.0 References

- Allerdale Borough Council, CarlisleCity Council, Copeland Borough Council, Cumbria County Council, Eden District Council, Lake District National Park Authority, South Lakelane District Council (2007) Habitats Regulations Assessment Cumbria Wind Energy Supplementary Planning Document
- Band, W., Madders, M. and Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at windfarms. In De Lucas, M., Janss, G. and Ferrer, M. (eds) 'Birds and Wind Power'.
- BVG Associates (2019) Initial review of decommissioning and restoration requirements and costs at Askam and Lowca wind farms
- Copeland Borough Council (2013) Copeland Borough Council Core Strategy 2013-2028 [Online] Available at https://www.copeland.gov.uk/content/copeland-local-plan. Accessed 28.02.2020.
- Cumbria Naturalists Union (2019). Birds and Wildlife in Cumbria 2017. A County Natural History Report.
- DEFRA (2019) Cumbria Coast Marine Conservation Zone [Online]. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/805616/mcz-cumbria-2019.pdf. Accessed 28.02.2020.
- DTA (2020). The Habitats Regulations Assessment Handbook [online]. Available at: https://www.dtapublications.co.uk. Accessed 28.02.2020
- European Commission (2020) The Habitats Directive [Online] Available at https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm. Accessed 28.02.2020
- Freeths (2018) Environmental Bulletin – Spring 2018: Habitat Regulations Assessments: No More Screening Out with Mitigation Measures? A Summary of the Recent Case of People Over Wind and Sweetman (C-323/17) http://www.freeths.co.uk/2018/04/19/environmental-bulletin-spring-2018/. Accessed January 2019.
- Furness, R.W. (2019). Avoidance rates of herring gull, great black-backed gull and common gull for use in the assessment of terrestrial wind farms in Scotland. Scottish Natural Heritage Research Report No. 1019.
- JNCC (2015) Natura 2000 Standard Data Form. River Derwent and Bassenthwaite Lake SAC. [Online] Available at: https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030032.pdf. Accessed 28.02.2020.
- JNCC (2015a) Natura 2000 Standard Data Form. River Ehen [Online]. Available at https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030057.pdf. Accessed 28.02.2020.
- Natural England (2014) Site Improvement Plan River Derwent & Bassenthwaite Lake [Online] Available at: http://publications.naturalengland.org.uk/publication/5735697705074688. Accessed 28.02.2020.
- Natural England (2014a) Site Improvement Plan: River Ehen (SIP192) [Online] Available at http://publications.naturalengland.org.uk/publication/6203335036108800. Accessed 28.02.2020.
- Natural England (2018) European Site Conservation Objectives for River Derwent and Bassenthwaite Lake Special Area of Conservation. Site Code: UK0030032.
- Natural England (2018a) River Ehen SAC Conservation Objectives [Online] Available at: http://publications.naturalengland.org.uk/publication/4544671464292352 Accessed 28.02.2020.

- Natural England (2019) River Ehen SAC Conservation Objectives Supplementary Advice [Online] Available at: http://publications.naturalengland.org.uk/publication/4544671464292352. Accessed 28.02.2020.
- Natural England (2020) SSSI Condition Summary – River Derwent and Tributaries SSSI. [Online] Available at https://designatedsites.naturalengland.org.uk/ReportConditionSummary.aspx?SiteCode=S2000214&ReportTitle=River%20Derwent%20and%20Tributaries%20SSSI. Accessed 28.02.2020.
- Natural England (2020a) SSSI Condition Summary – Bassenthwaite Lake SSSI. https://designatedsites.naturalengland.org.uk/ReportConditionSummary.aspx?SiteCode=S1003782&ReportTitle=Bassenthwaite%20Lake%20SSSI
- Natural England (2020b) SSSI Condition Summary - River Ehen (Ennerdale Water to Keekle Confluence) SSSI [Online]. Available at: https://designatedsites.naturalengland.org.uk/ReportConditionSummary.aspx?SiteCode=S2000147&ReportTitle=River%20Ehen%20(Ennerdale%20Water%20to%20Keekle%20Confluence)%20SSSI Accessed 28.02.2020.
- Open Space Ecology and Habitat Solutions (2019) Ecological Impact Assessment of Land at Blomfield, Lowca
- RSPB (2020) Razorbill [Online] Available at: https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/razorbill. Accessed 28.02.2020
- SNH (undated) Solway Firth Proposed Special Protection Area (pSPA) NO. UK9005012. SPA Site Selection Document: Summary of the scientific case for site selection [Online] Available at https://www.nature.scot/sites/default/files/2017-12/Marine%20Protected%20Area%20%28Proposed%29%20-%20Site%20selection%20document%20-%20Solway%20Firth.pdf. Accessed 28.02.2020.
- SNH (2012) assessing the cumulative impact of onshore wind energy developments. [Online] Available at: https://www.nature.scot/sites/default/files/2019-11/Guidance%20-%20Assessing%20the%20cumulative%20impact%20of%20onshore%20wind%20energy%20developments.pdf. Accessed 28.02.2020.
- SNH (2016) Solway Firth pSPA - Advice to Support Management. [Online]. Available at: https://www.nature.scot/sites/default/files/2017-12/Marine%20Protected%20Area%20%28Proposed%29%20-%20Advice%20to%20support%20management%20-%20Solway%20Firth.pdf. Accessed 28.02.2020.
- SNH (2018) Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas [Online] Available at https://www.nature.scot/sites/default/files/2018-02/Guidance%20-%20Assessing%20the%20significance%20of%20impacts%20on%20bird%20populations%20from%20onshore%20wind%20farms%20that%20do%20not%20affect%20protected%20areas.pdf. Accessed 28.02.2020.
- SNH (2019) European Site Conservation Objectives for Upper Solway Flats and Marshes Special Protection Area & Solway Firth potential Special Protection Area. Site Code: UK9005012 [Online] Available at https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030057.pdf. Accessed 28.02.2020.
- WYG (2020a) Park House Farm Wind Farm: Ecological Appraisal.
- WYG (2020b) Park House Farm Wind Farm: Bird Vantage Point Survey Report.
- WYG (2013) Allerdale Borough Council - Local Plan Habitats Regulations Assessment

- WYG (2020) Park House Farm Wind Farm, Lowca, Cumbria Bird Vantage Point Survey Report
- White Young Green (2006) Proposed Leisure Development Micklam Farm, Lowca Environmental Statement

FIGURES

Appendix A – Report Conditions

REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Cannock Wind Farm Services Limited ("the client") for the proposed uses stated in the report by WYG Environment Planning Transport Limited ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

No liability is accepted or warranty given for; unconfirmed data, third party documents and information supplied to WYG or for the performance, reliability, standing etc. of any products, services, organisations or companies referred to in this report. WYG does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information, which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.

ecology@wyg.com

WYG Environment Planning Transport Limited.

Registered in England & Wales Number: 3050297
Registered Office: 3 Sovereign Square, Sovereign Street, Leeds, West Yorkshire, LS1 4ER

creative minds safe hands