Able Marine Energy Park: Article 7 Extension of Time

Habitats Regulations Assessment Report

Part 1: Likely Significant Effect (LSE) Test

DRAFT FOR CONSULTATION

Ecology Consulting Report to Able UK Ltd

February 2024

Executive Summary

This document sets out the assessment of the likely significant effects of the proposed Article 7 extension of time for the Able Marine Energy Park Project on the network of Natura 2000 European protected ecological sites, also known as "the National Site Network". It provides the necessary information to enable Natural England, as the Government's statutory nature conservation body, to advise on the potential impacts of the project and, in particular, whether an appropriate assessment is required.

This proposed time extension is to allow the development consented under the AMEP Material Change 2 application in July 2022 to be completed, or substantially commenced, within 17 years from the coming into force of the DCO (a time extension of 7 years).

The requirement for this Assessment is set out under Article 6 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna, (the 'Habitats Directive'). Article 6 requires that any plan or project which is not directly connected to, or necessary to the management of the National Site Network and which is likely to have a significant effect on the conservation objectives of the site, either individually or in combination with other plans and projects, should be subject to an appropriate assessment. Article 6(3) is fully transposed in English law by Requirement 63 of the Conservation of Habitats and Species Regulations 2017 (SI2017/1012).

This Assessment has been prepared with due consideration given to the information provided in Planning Inspectorate's (PINS) tenth advice note on 'Habitat Regulations Assessment relevant to nationally significant infrastructure projects (NSIP)'.

The proposed time extension to the Able Marine Energy Park Project was considered to have the potential to have effects on the Humber Estuary SPA, the Humber Estuary Ramsar site and the Humber Estuary SAC. It concludes Likely Significant Effects for eight of the qualifying SPA species (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, shelduck and redshank) and for six of the wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal).

There would also be LSE for the Humber Estuary SAC, for its (a) estuarine habitat; (b) intertidal mudflat, (c) *Salicornia* and other annuals colonising mud and sand; (d) Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*); (e) grey seal and (f) river lamprey and sea lamprey populations.

The same conclusions were reached in the HRA Information Report for the original consented application[1] and for the consented Material Change 2[2].

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000572-16%20-%20Habitat%20Regulations%20Assessment%20Report%20(15).pdf

[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000531-TR030006%20-%20HRA%20Report.pdf

1. Introduction and Background

1.1. This report forms part of the application for a time extension to the consented Able Marine Energy Park Development (referred to hereafter as the 'Project'). It addresses the nature conservation issues raised by the Project, specifically in relation to the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'). It comprises the first part of the information to inform the Habitat Regulations Assessment (HRA) for the project, and considers the proposal's potential to have likely significant effects (LSE) on relevant sites of international nature conservation importance.

1.2. The document is set out as follows:

- A brief overview of the Project;
- An outline of the HRA process;
- A summary of information on the designated sites of nature conservation interest to be included in the HRA;
- An update to the baseline for all of the SPA/Ramsar/SAC populations/communities, including:
  - Changes to baseline habitats
  - Changes to baseline bird numbers
  - Changes to development baseline for cumulative
- An assessment of whether the proposed Time Extension to the Project would have a likely significant effect with regard to the designated features of the international sites under consideration, or on any designated feature's supporting habitats and species.

1.3. The purpose of the report is to update the previous HRA that was undertaken for the DCO and for the Material Change 2. Those HRAs could not rule out LSE for a range of qualifying features of the Humber Estuary SPA/Ramsar site, so Appropriate Assessments were undertaken by the Secretary of State for Transport. They concluded that an adverse effect on integrity could not be discounted with the required degree of certainty. The Project was determined to be both needed and having imperative reasons of overriding public interest (IROPI), and a compensation scheme was agreed. [3]

1.4. Brexit has made no change to the process of HRA so far, so for simplicity the previous language and references to EU Directives are retained in this assessment.

Outline of the Habitats Regulations Assessment Process

1.5. The EU Directive 92/43/EEC on the conservation of habitats and of wild flora and fauna (known as the 'Habitats Directive') protects habitats and species of European nature conservation importance. Together with Directive (2009/147/EC) on the conservation of wild birds (the 'Birds Directive'; European Commission 2009), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation (SACs) and Sites of Community Importance (SCIs) are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas (SPAs) are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of

[3] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002225-SoS%20Decision%20letter%20with%20annexes.pdf

designated sites, which are hereafter referred to as 'European Sites'. The term 'European Site' also includes European Marine Sites.

1.6. The Habitats Regulations incorporate all SPAs into the definition of 'European sites' and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

1.7. In addition to sites designated under European nature conservation legislation, it is UK Government policy that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them. The Government also affords the same level of protection to potential SPAs (pSPAs) and proposed SACs (pSACs).

1.8. Regulation 63 of the 2017 Conservation of Habitats and Species Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if the proposed development is unconnected with site management and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 63(1)).

1.9. The Planning Inspectorate (PINS, November 2017) published version 8 of its tenth advice note, on '*Habitat Regulations Assessment relevant to nationally significant infrastructure projects*'[4]. The note sets out non-statutory advice, information and recommendations on the approach to the Habitats Regulations assessment. The note should be also read in conjunction with the Habitats Directive, the Habitats Regulations (as amended), relevant Government Planning Policy, and non statutory European guidance applicable in English law before 31.12 20 (exit day). It recommends a four-stage process:

i. Screening: Determining whether the plan or project '*either alone or in-combination with other plans or projects*' is likely to have a significant effect on a European site (or sites);

ii. Appropriate Assessment: Determining whether, in view of the European site's conservation objectives, the plan or project *'either alone or in-combination with other plans or projects*' would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed; and

iii. Mitigation and Alternatives: Where the plan or project is assessed as having an adverse effect (or risk of this) on the integrity of a site, there should be an examination of mitigation measures and alternative solutions. Mitigation should be considered first, so as to avoid an adverse effect if possible.

iv. If it cannot be proven that there is no adverse effect on site integrity, it must be demonstrated that no alternatives to the proposal exist and then imperative reasons of overriding public interest (IROPI) can be considered. This is not considered a standard part of the process and will only be carried out in exceptional circumstances. If consent is granted at this stage compensation is required to ensure the coherence of the Natura site network.

1.10. All four stages of the process are referred to cumulatively as the Habitats Regulations Assessment, to clearly distinguish the whole process from the step within it referred to as the 'Appropriate Assessment'.

1.11. Non statutory guidance is further provided in Natural England's Standard: HRA Habitats Regulations Assessment (HRA) (NESTND026), including on the 'Determination of Likely Significant Effects under the Habitats Regulations' . This involves a preliminary consideration of whether a qualifying feature is likely to be directly, or indirectly, affected (in which case there is a procedural presumption that a significant effect is likely). In such a case, a fuller consideration

[4] https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf

should then be applied, using further analysis and information, to confirm and justify the presence or absence of Likely Significant Effects. A Likely Significant Effect is, in this context, 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. The English courts have also clarified that likely involves real risk and probability, not hypothetical scenarios, which is also captured in Defra's Guidance (Habitats Regulation Assessment: Protecting a European Site).

1.12. Figure 1 is reproduced from Advice Note Ten and shows how effects on European sites are considered.

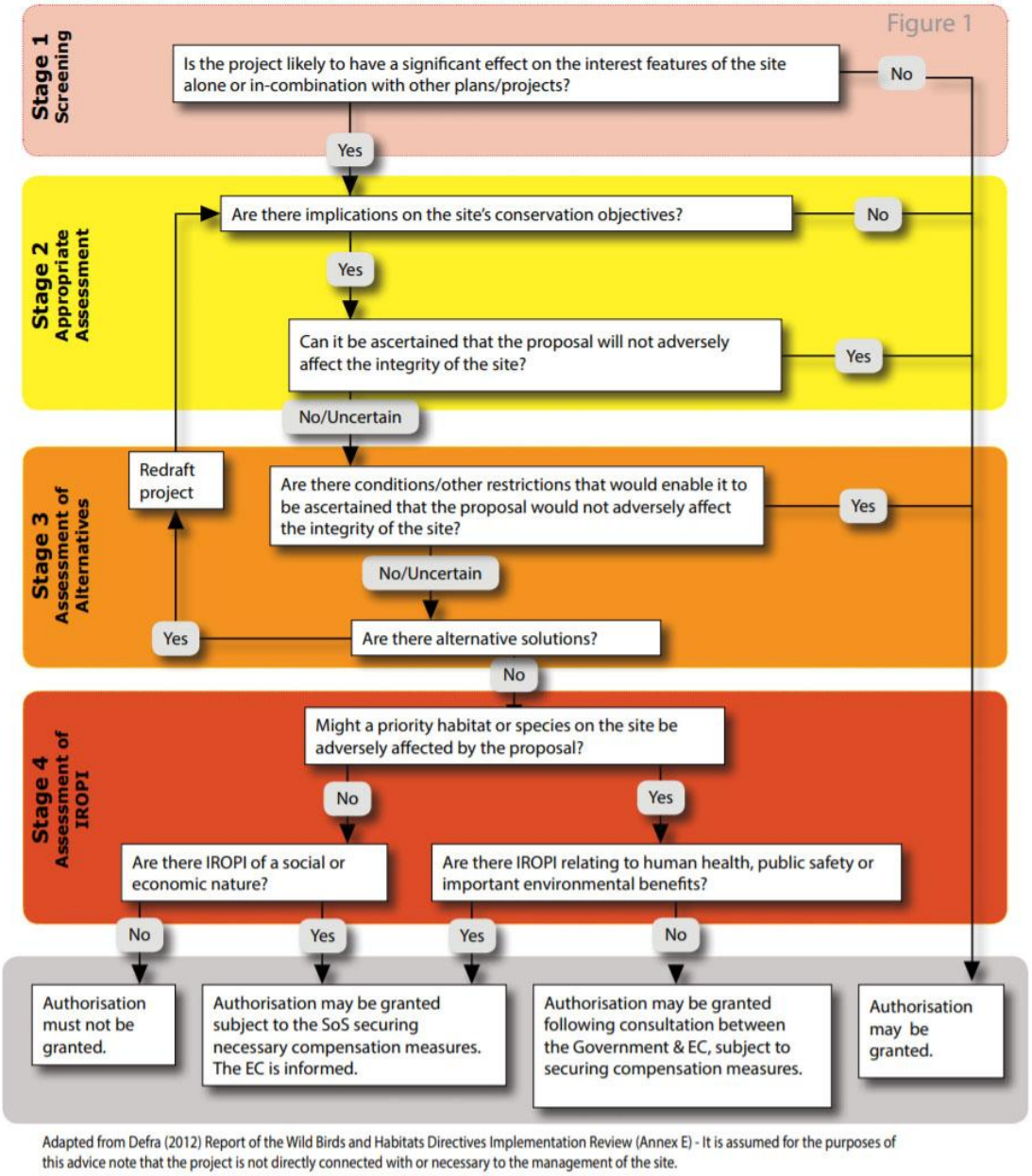

Figure 1. Consideration of projects affecting European sites

2. Project Description

Introduction

2.1. A description of the consented Project is set out in (1) Chapter 2 of the shadow HRA Information Report submitted by the Applicant with the original application in December 2011[5] (see footnote 1), and (2) the proposed material changes in Chapter 4 of the Updated Environmental Statement (UES) submitted with that application[6]. Further information on the proposed time extension is given in the Environmental Review Report[7].

2.2. The proposed Time Extension would make no changes to the Material Change 2 scheme as consented in July 2022, but simply extend the time period over which that project would be constructed by an additional 7 years to 29 October 2031. This would allow the development to be completed, or substantially commenced, within 17 years from the coming into force of the Order.

2.3. No changes are proposed to the compensation measures already consented by the Secretary of State for the loss of intertidal and estuarine habitat and its possible consequential effects on the waterbird assemblage.

2.4. No new operations are proposed as part of the Time Extension, and consequently, there would be no additional noise disturbance.

[5] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000572-16%20-%20Habitat%20Regulations%20Assessment%20Report%20(15).pdf

[6] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000126-TR030006-APP-6-4.pdf

[7] https://www.ableuk.com/sites/port-sites/humber-port/able-dco-extension/

3. Consultation

3.1. Able Humber Port Ltd has consulted on this proposed time extension, including the production of an Environmental Review. The consultation material is available at: https://www.ableuk.com/sites/port-sites/humber-port/able-dco-extension/.

3.2. Natural England did not respond to the consultation, but North Lincolnshire Council confirmed that the "local planning authority has no objections to raise with respect to the proposed time extension", and that "the LPA agrees with the conclusions of the review in that the proposed extension to the implementation period is unlikely to result in new or materially different environmental impacts and that the necessary mitigation is already secured and/or is in situ."

3.3. ABP recommended the inclusion of additional Wetland Bird Survey (WeBS) data for 2020/21 and 2021/22. These have been included in this report (see Tables 3,4, 10 and 11 below).

4. Site Screening Methodology

4.1. The screening process has initially considered all European sites (SPAs, SACs and Ramsar sites, including potential SPAs and proposed SACs as well as fully designated ones) within a 20km search zone from the Project. Further consideration of more distant sites was undertaken to investigate where there could be any ecological link to the Project.

4.2. For avifauna**,** a worst-case approach has been adopted, assuming that all birds using the Humber Estuary and its functionally linked habitat within 1km of the Project site could potentially be affected by the proposed development. This represents a worst case for the purposes of this report at this stage of the assessment.

4.3. For features considered under the term 'benthic ecology' a screening range of 20km is considered to be sufficient at this stage.

4.4. For marine mammals, it is standard practice to apply different screening ranges together with consideration of potential for site connectivity. For seals, such ranges are linked to potential foraging ranges/project level modelling (primarily underwater noise modelling), together with consideration of site connectivity determined from at sea usage data. For cetaceans, interest would be limited to the Southern North Sea SAC – which at 35km distance is located further from the project than the maximum screening range (26km) that applies to the site (JNCC 2020).

4.5. Up to date baseline data have been used to determine which qualifying features occur within potential impact zone of the Project, and the importance of those features in the context of their European site populations.

4.6. The categories used to report the conclusions of the screening assessment were as follows:

- **No Likely Significant Effect** - based on available information on the Project and its potential effects, it is considered that there would be no reasonable scientific doubt about the absence of a likely significant effect, either alone or in combination, with respect to the identified feature and site. This determination is based on a number of factors, but mainly the distance between the Project and the designated area and the lack of any direct or indirect impact pathways that could affect the site's designated features;
- **Likely significant effect** – based on available information the Project would have an impact, either alone or in combination, upon designated features and could lead to significant adverse temporary or long-term change.

5. Plans and Projects to be Considered In-Combination

5.1. The projects considered in-combination in the Time Extension application are as follows (those considered in the original application were as set out in the HRA information Report at Section 4.12 (see footnote 1), and those for the Material Change 2 in Section 5.1 of that HRA):

- Able Logistics Park – PA/2015/1264 – North Lincolnshire Council
- North Killingholme Generating Station (DCO Application) - Development of a thermal generating station
- Hornsea Offshore Wind Farm (Zone 4) Project 2 (DCO Application)
- Yorkshire Energy Park (17/01673/STOUTE – East Riding of Yorkshire Council)
- Outstrays to Skeffling Managed Realignment Site;
- South Humber Gateway Mitigation Areas (including Cress Marsh, Novartis and the former Huntsman Tioxide site).
- The Immingham Open Cycle Gas Turbine Order 2020 (DCO) – Construction of a new Open Cycle Gas Turbine Power Station.
- Erection of a monopile manufacturing facility – PA/2021/1525 (consented).
- AHP Ltd Enabling Works South – PA/2023/502 – North Lincolnshire Council.
- VPI Power – post-combustion carbon capture plant – PA/2023/421
- ABP Westgate Immingham – PA/2022/1223.

5.2. Consideration has also been given to the possible inter-related effects of construction and operation on the Project site at the same time (as part may become operational at the same time as construction continues in other parts).

6. Designated Sites Potentially Affected by the Project

6.1. All European protected sites (designated and proposed) within 20km of the Project have been considered in this assessment. Further consideration has also been given to more distant sites where there could possibly be an ecological link to the Project site.

Humber Estuary SPA

6.2. The AMEP Project lies partly within the Humber Estuary SPA.

Table 2. Information on populations of internationally important species of birds under the Birds Directive using the Humber Estuary European marine site.

ARTICLE 4.1 QUALIFICATION (79/409/EEC): Internationally important populations of regularly occurring Annex 1 species:

Species	Population (5-yr mean of peaks)	Period	International and national importance
Avocet	59 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7%
Bittern	4 individuals – wintering	5 year peak mean 1998/99 – 2002/03	4.0%
Hen harrier	8 individuals – wintering	5 year peak mean 1997/98 – 2001/02	1.1%
Golden plover	30,709 individuals – wintering	5 year peak mean 1996/97 – 2000/01	12.3%
Bar-tailed godwit	2,752 individuals – wintering	5 year peak mean 1996/97 – 2000/01	4.4%
Ruff	128 individuals – passage	5 year peak mean 1996-2000	1.4%
Bittern	2 booming males – breeding	3 year mean 2000-2002	10.5%
Marsh harrier	10 females – breeding	5 year mean 1998-2002	6.3%
Avocet	64 pairs – breeding	5 year mean 1998 – 2002	8.6%
Little tern	51 pairs – breeding	5 year mean 1998-2002	2.1%

ARTICLE 4.2 QUALIFICATION (79/409/EEC): Internationally important populations of regularly occurring migratory species:

Species	Population (5-yr mean of peaks)	Period	International and national importance
Shelduck	4,464 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.5% Northwestern Europe (breeding)
Knot	28,165 individuals – wintering	5 year peak mean 1996/97 – 2000/01	6.3% *islandica*
Dunlin	22,222 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7% *alpina*, Western Europe (non-breeding)
Black-tailed godwit	1,113 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.2% *islandica*
Redshank	4,632 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.6% *brittanica*
Knot	18,500 individuals – passage	5 year peak mean 1996 – 2000	4.1% *islandica*
Dunlin	20,269 individuals – passage	5 year peak mean 1996 – 2000	1.5% *alpina*, Western Europe (non-breeding)
Black-tailed godwit	915 individuals – passage	5 year peak mean 1996 – 2000	2.6% *islandica*
Redshank	7,462 individuals – passage	5 year peak mean 1996 – 2000	5.7% *brittanica*

ARTICLE 4.2 QUALIFICATION (79/409/EEC): Internationally important assemblage of waterbirds:

Importance	Population (5-year mean of peaks 1996/97 – 2000/01)
Humber Estuary SPA supports large populations (>20,000) of wintering waterbirds	In the non-breeding season, the area regularly supports 153,934 individual waterbirds, including dark-bellied brent goose, shelduck, wigeon, teal, mallard, pochard, scaup, goldeneye, bittern, oystercatcher, avocet, ringed plover, golden plover, grey plover, lapwing, knot, sanderling, dunlin, ruff, black-tailed godwit, bar-tailed godwit, whimbrel, curlew, redshank, greenshank and turnstone.

6.3. The conservation objectives for this site are:

- *"With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified, 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 populations of the qualifying features;*
- *The distribution of the qualifying features within the site."*

6.4. Further details on these conservation objectives are contained in the Supplementary Advice on Conservation Objectives[8].

6.5. In addition to the above bird species, the SPA also affords protection to their supporting habitats, which have been identified by Natural England in their Advice on Operations[9] as follows:

- Annual vegetation of driftlines (sand and shingle)
- Artificial structures such as derelict pier/jetty structures, flood defences
- Coastal lagoons
- Freshwater and coastal grazing marsh
- Freshwater and tidal reedbeds
- Freshwater wetlands
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal mixed sediments
- Intertidal sand and muddy sand
- Intertidal sand and mudflats
- *Salicornia* and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Sand dunes
- Supralittoral sand and shingle
- Tidal reedbeds
- Water column

6.6. This includes functionally linked habitat outside SPA boundary as well as areas within the SPA.

Humber Estuary Ramsar site

6.7. The Humber Estuary Ramsar site is largely coterminous with the SPA, and the Project lies partly within the Ramsar site. Its qualifying features include:

- Range of important estuarine habitats;

[8] https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9006111&SiteName=humber&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&HasCA=1&NumMarineSeasonality=15&SiteNameDisplay=Humber%20Estuary%20SPA#hlco

[9] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/520290/SAC-feature-descriptions.pdf

- Internationally important non-breeding waterbird assemblage;
- Internationally important non-breeding populations of shelduck, golden plover, knot, dunlin, bar-tailed godwit, black-tailed godwit and redshank;
- Important migration route for river lamprey and sea lamprey;
- Breeding grey seals;
- Natterjack toad.

6.8. The citation for the Humber Estuary SPA is given in Appendix 1, and that for the Ramsar site in Appendix 2.

Greater Wash SPA

6.9. This marine SPA lies 18km from the project at its nearest point. Its qualifying features comprise three breeding bird species (Sandwich tern, common tern and little tern) and three non-breeding species (red-throated diver, little gull and common scoter).

6.10. Given its qualifying features, its distance from the Project and the nature of the proposed project, together with the clear lack of any ecological link, it can be safely concluded that there would be no LSE on this SPA, so it is not considered further in this report.

Humber Estuary SAC

6.11. AMEP lies partly within the Humber Estuary SAC. Annex I habitats that are a primary reason for the designation of the site include:

- estuaries (including sub-tidal habitat); and
- mudflats and sandflats not covered by seawater at low tide.

6.12. Other Annex I habitats that are present as qualifying features but are not a primary reason for the designation include:

- sandbanks which are slightly covered by seawater all the time;
- coastal lagoons;
- *Salicornia* and other annuals colonising mud and sand;
- Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*);
- embryonic shifting dunes;
- shifting dunes along the shoreline with *Ammophilia arenaria (*'white dunes');
- fixed dunes with herbaceous vegetation ('grey dunes'); and
- dunes with *Hippophae rhamnoides*.

6.13. Grey seals *Halichoerus grypus*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* are Annex II species present in the Humber Estuary and are a qualifying feature, but not a primary reason for the site selection.

6.14. The Humber Estuary SAC Conservation Objectives are as follows:

- 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 structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

6.15. The citation for the Humber Estuary SAC is given in Appendix 3.

Southern North Sea SAC

6.16. The Southern North Sea SAC lies approximately 35km from the project at its nearest point and has been designated for the Annex II species harbour porpoise only. The distance between the SAC and the project exceeds the maximum screening range of 26km (JNCC 2020). Given the available information, it can be safely concluded that there would be no potential for LSE on the harbour porpoise feature of the SAC and the site is not considered further in this report.

Wash and North Norfolk Coast SAC

6.17. The Wash and North Norfolk Coast SAC lies approximately 68km from the project at its nearest point and has been designated for a number of Annex I habitats, together with the Annex II species harbour seal as a primary reason for site selection. The distance between the SAC and the project is within the likely foraging range of harbour seal (120km, Thomson *et al* 2016, MMO 2018), though at sea usage data does not indicate any site connectivity between the SAC and the Humber (MMO 2018). Given the available information, it can be safely concluded that there would be no potential for LSE on the harbour seal feature of the SAC and the site is not considered further in this report.

Berwickshire and North Northumberland Coast SAC

6.18. The Berwickshire and North Northumberland Coast SAC, located about 210km from the project, includes the Annex II species grey seal as a primary reason for selection of the site. The distance between the SAC and the project lies well beyond the likely maximum foraging range of grey seal (145km, Thompson *et al*, 1996, MMO 2018). Further, at sea usage data does not indicate any site connectivity between the SAC and the Humber (MMO 2018). Given the available information, it can be safely concluded that there would be no potential for LSE on the grey seal feature of the SAC and the site is not considered further in this report.

6.19. Additional consideration has also been given to the shipping routes that would be used to service the Project. This included an assessment of the possible noise and visual disturbance effects on any SPAs/SACs through which these routes may pass in UK waters.

6.20. Given that the large majority of shipping movements related to the Project would be directly to/from Europe or the offshore wind development sites, they would not likely to pass regularly through any other UK SPAs or SACs, and would not therefore result in any LSE.

7. Description of the Baseline Environment

Benthic and Marine Habitats

The Humber Estuary

7.1. The Humber is an extensive macrotidal estuary on the east coast of England, characterised by a large tidal range and high levels of suspended sediment, with hydrodynamic processes creating a dynamic rapidly changing system with accretion and erosion of intertidal and sub-tidal habitats.

7.2. The Humber is a dynamic estuarine system with changes in currents, tidal inundation, salinity etc. that create a difficult environment for many invertebrate organisms to flourish. The invertebrate community that colonises such areas can therefore be restricted to a relatively low number of species that are able to adapt to these environmental rigours.

7.3. The same physical conditions also allow for those species that can tolerate them, to be present in very large numbers in the deposited soft sediments, e.g. intertidal soft sediment mudflats. The physico-chemical conditions make estuaries highly productive and through a complex food web are able to support very large numbers of invertebrate organisms such as worms and molluscs, which are able to feed on lower trophic guilds and other available organic material as well as on each other.

7.4. Productivity from these communities has been estimated at over 500kg per ha per year on the Humber (IECS, 1994), and forms an important food resource for primary predators such as fish and birds. The importance of the Humber Estuary for birds and fish, and the habitats supporting these, is recognised in a series of International/European conservation designations.

Intertidal Invertebrate Communities

7.5. Allen (2006) describes the intertidal benthic community of the middle estuary south shore to be less diverse than in outer estuary, being dominated by *Corophium volutator, Streblospio shrubsolii, Hediste diversicolor* and the Spionid polychaete *Pygospio elegans*. Low abundances of *Macoma balthica* were also present with numbers increasing towards the outer estuary and in mid shore areas. These communities are typical for an estuarine habitat and primarily structured according to salinity, shore height and presumably sediment type. Whilst some communities are relatively impoverished these appear to be typical for such habitats and some variation in community structure is expected in a dynamic estuary.

7.6. The increase in intertidal elevation and colonisation by saltmarsh communities at the AMEP site has led to a loss of mudflat extent and influenced the distribution of several key species of invertebrate such as *Hediste diversicolor*. However, in the muddier areas, the 2015 and 2016 surveys recorded a broadly similar assemblage to that recorded in the baseline of 2010 for the original ES supporting the DCO application in 2011.

7.7. The original ES baseline commonly recorded *Tubificoides benedii*, Nematoda, the polychaete *Streblospio shrubsolii* and the amphipod crustacean *Corophium volutator* from the intertidal survey. The bivalve *Macoma* (*Limecola*) *balthica* was widespread and the polychaete *Hediste diversicolor* was present at most of the upper shore stations.

7.8. A broadly similar intertidal invertebrate assemblage was recorded in 2015 and 2016 at the AMEP site, although with some restrictions in the extent of the typical intertidal mudflat community correlating to saltmarsh community colonisation.

7.9. Allen (2017 & 2020) concluded that the intertidal component of the AMEP development area supports an invertebrate assemblage that is characteristic of the site's location in the middle estuary, '*typical for muddy or sandy intertidal sediments and adjacent subtidal habitats in the mid to outer Humber and generally correspond to those recorded in previous surveys'* (Allen, 2017) and '*the results of the 2016 intertidal benthic survey indicate that the North Killingholme mudflats maintain a variety of infaunal invertebrates including good examples of mid estuary mud assemblages'* Allen, 2020).

7.10. It is considered likely that the increase in elevation and saltmarsh colonisation seen in 2015 and 2016 has continued to the present day, with a substantial extent of the AMEP development intertidal frontage now featuring saltmarsh in the upper to mid shore. As such, it is likely that the extent and/or composition of the intertidal invertebrate community recorded in this area will have reduced in response to the increase in elevation and associated saltmarsh development.

7.11. On this basis, it is concluded that there is the probability of natural variation in community composition over time, reflecting changes in estuarine dynamics, but given the community adaptation and continued active utilisation of the dredge areas and deposit grounds, no significant change outwith these parameters is expected.

Subtidal Benthic Ecological Data

7.12. A range of mud, sands and gravels are present within the subtidal area of middle estuary, these with associated biological communities, and with biotopes describing these in Chapter 10 Table 10-2 of the UES.

7.13. The 2016 subtidal survey (Allen, 2020) reported the subtidal bed to feature a very impoverished faunal community typical for the middle Humber and in line with findings from previous surveys (e.g. as described in the DCO ES and supporting documentation e.g. Appendices UES10-3 and UES10-4), including species such as *Capitella* sp., *Arenicolidae* sp. (*Arenicola marina*), *Eurydice pulchra, Gammarus salinus*, *Corophium volutator*, *Nematoda* spp., *Polydora cornuta, Pygospio elegans, Streblospio shrubsolii* and *Tubificoides benedii*.

7.14. Allen (2020) concluded that the infaunal communities recorded during the 2015 subtidal survey around the potential dredge disposal areas were typical for dynamic mud, sand or mixed sediment subtidal sediments in the mid to outer Humber Estuary.

7.15. The area within which AMEP will directly impact tends to exhibit muddier sediments with muddy sands or sandy muds sometimes with small quantities (<1%) of gravel (slightly gravelly sandy mud or slightly gravelly muddy sand). Additional surrounding habitats that could be affected by the development include included muddy habitats including sandy muds or muddy sands (or slightly gravelly muddy sand/sandy muds) and two sandier sites (Allen, 2020).

7.16. The direct impact and surrounding areas were also characterised by low numbers of *Capitella* sp. but included modest numbers of species such *Corophium volutator* and *Streblospio shrubsolii*. However, many of the taxa present in these areas were recorded at relatively few sites. In terms of biomass the direct impact area was dominated by *Carcinus maenas* (1 site only), *Limecola balthica, Corophium volutator, Arenicolidae* sp. (*Arenicola marina*) and *Gammarus salinus* these species collectively accounting for over 90% of total biomass.

Saltmarsh Communities

7.17. At the time of the original baseline work, there was little or no evidence of substantial saltmarsh vegetation occurring across the central mudflat of the AMEP development, other than some

fringing communities on the upper shore adjacent to the flood bank, upstream adjacent to North Killingholme.

7.18. However, the potential for accretion of the intertidal mudflat and associated increase in elevation and potential colonisation by saltmarsh was identified in the Examining Authority's Report (2013, paragraph 10.79)[10].

7.19. A clear expansion in the extent of saltmarsh communities and corresponding reduction in intertidal mudflat, e.g. as surveyed in 2020 and 2021, has occurred on the intertidal frontage of the proposed AMEP development site since the original ES baseline work of the DCO.

Fish Assemblage

7.20. Two species of fish are qualifying features of the Humber Estuary SAC and hence are relevant to the HRA, sea lamprey and river lamprey.

7.21. The direct comparison between the different fish baseline data is limited by the use of different sampling methods, with different selectivity, used in different habitats and with variable sampling effort (e.g. within and between seasons). Also, the natural variability in population dynamics (e.g. inter-annual fluctuations in recruitment) may affect the fish species occurrence and abundance in the catches over time.

7.22. Considering these factors, and in the context of the wider knowledge of fish assemblages and their distribution in the lower Humber Estuary, there were no significant changes in the baseline for fish at the AMEP site, and the relevant receptors remain the same, including for the two SAC qualifying species, sea lamprey and river lamprey.

7.23. The fish fauna recorded at the AMEP site and in the surrounding areas has remained a reflection of the typical assemblage of intertidal and subtidal areas of this part of the estuary, and of the role of these habitats in supporting young stages of estuarine and marine migrant fish (especially gobies and flatfish), also through provision of abundant food resources. There was no evidence of preferred use of these areas by migratory fish, confirming earlier observations.

Marine Mammals

7.24. One marine mammal species is a qualifying feature of the Humber Estuary SAC and hence is relevant to the HRA, grey seal.

7.25. Due to the low frequency of occurrence and high mobility of marine mammals in the low to middle estuary, dedicated surveys were not conducted for the original ES nor to support this material amendment. The occasional presence of these species in the vicinity of the AMEP development relates to the potential presence of prey items (see text on Fish and Invertebrate Communities), and the populations of the species in the wider region e.g. Southern North Sea.

Ornithology

7.26. Ornithological data to update the baselines for the Project and for the Material Change 2 have been obtained from a range of sources, including the following:

[10] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-002249-The%20Able%20Marine%20Energy%20Park%20Order%20201X%20Panel's%20Findings%20and%20Recommendations%20with%20Appendices.zip

- BTO Wetland Bird Survey (WeBS) high tide (core) counts (2016-17 to 2021-22) - the most up-to-date 5-year mean peak core high tide counts currently available, for the Killingholme Marshes and Foreshore, and for the North Killingholme Havev Pits WreBS count sectors;
- Additional surveys of Killingholme Marshes and Foreshore, the North Killingholme Haven Pits and the AMEP DCO development site undertaken by Ecology Consulting for Able UK during winter 2022-23. This survey work comprised through the tide' counts repeated regularly through the day to cover a range of tidal conditions (i.e. '). Forty-eight surveys were undertaken over 12 survey days from October 2022 to March 2023.

7.27. The data are presented first for the Killingholme Marshes Foreshore and then for North Killingholme Haven Pits.

Killingholme Marshes Foreshore

BTO WeBS Data

7.28. Table 3 summarises the most recently available five-year mean peak counts from the Killingholme Marshes Foreshore sector, giving the peak for each winter, the mean peak over the last five years, and the % that this comprises of the whole Humber Estuary population over the same period.

Table 3. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the Killingholme Marshes Foreshore sector and the percentage this makes up of whole Humber Estuary SPA, 2017/18 - 2021/22.

Species	SPA species*	2017/18	2018/19	2019/20	2020/21	2021/22	Mean peak	% SPA
Mute Swan		0	7	4	3	2	3	2.1%
Greylag Goose		34	41	23	180	185	93	5.2%
Canada Goose		0	0	0	0	42	8	1.2%
Shelduck	Q	110	58	93	55	27	69	1.1%
Wigeon	A	1	0	31	12	16	12	0.3%
Gadwall		17	18	64	61	30	38	15.3%
Teal	A	376	428	192	463	432	378	7.2%
Mallard	A	41	64	98	68	114	77	6.9%
Pintail		2	6	8	6	8	6	6.1%
Shoveler	A	78	70	93	43	31	63	21.4%
Pochard	A	0	0	0	0	0	0	0.0%
Tufted Duck		2	2	2	2	0	2	0.7%
Little Grebe		1	0	4	4	4	3	4.6%
Great Crested Grebe		0	0	1	0	0	0	1.1%
Cormorant		2	0	2	1	1	1	0.3%
Little Egret		2	1	1	0	1	1	0.5%
Grey Heron		1	3	1	1	1	1	3.7%
Water Rail		1	0	0	0	0	0	1.4%
Moorhen		2	4	18	5	7	7	13.8%
Coot		14	26	31	29	7	21	7.7%
Oystercatcher	A	7	3	8	3	5	5	0.1%
Avocet	Q	29	60	131	32	82	67	2.6%
Little Ringed Plover		1	2	1	1	1	1	20.0%
Ringed Plover	A	5	2	22	94	9	26	2.5%
Grey Plover	A	0	0	0	0	0	0	0.0%
Lapwing	A	397	1930	876	1418	1297	1184	7.8%
Knot	Q	0	0	12	0	0	2	0.0%
Sanderling	A	0	0	0	3	0	1	0.1%
Dunlin	Q	245	349	1000	380	187	432	2.5%
Ruff	Q	1	0	0	0	0	0	0.3%
Snipe		3	4	0	0	5	2	2.2%
Black-tailed Godwit	Q	1650	1120	2400	2240	1150	1712	30.3%
Bar-tailed Godwit	Q	6	0	0	0	0	1	0.1%
Curlew	A	97	120	34	64	115	86	3.4%
Common Sandpiper		0	1	0	2	0	1	1.4%
Green Sandpiper		0	0	0	0	1	0	1.7%
Redshank	Q	210	86	145	92	32	113	4.2%
Turnstone	A	0	16	5	2	0	5	1.6%

* Q = qualifying species, A = assemblage species.

7.29. Table 4 compares the WeBS five-year mean peak counts presented in the original ES (2004/05 – 2008/09), for the Material Change 2 (2015/16-2019/20) and for the most recently available five

years (2017/18 – 2021/22). The Table also gives the percentages that these comprised of the whole Humber Estuary population for each time period. Overall, there have been no notable changes in any species' status since the Material Change 2 application.

Table 4. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the Killingholme Marshes Foreshore sector and % of the whole Humber Estuary for 2004-08 (as presented in the original ES), for 2015-16 - 2019-20 (Material Change 2) and for the more recent 2017/18 – 2021/22.

Species	SPA sp.*	5-year mean peak ES (04-08)	5-year mean peak MC2 (15-19)	5-year mean peak TE (17-21)	% SPA mean peak ES	% SPA mean peak MC2	% SPA mean peak TE
Mute swan		3	2	3	1.0%	1.5%	2.1%
Shelduck	Q	9	75	69	0.2%	1.7%	1.1%
Shoveler		11	53	63	8.9%	24.7%	21.4%
Gadwall		4	21	38	2.9%	9.6%	15.3%
Mallard	A	13	45	77	0.6%	4.3%	6.9%
Teal	A	13	244	378	0.5%	6.6%	7.2%
Pochard	A	1	0	0	0.3%	0.0%	0.0%
Tufted duck		4	2	2	1.0%	0.7%	0.7%
Smew		1	0	0	50.0%	0.0%	0.0%
Little grebe		2	1	3	2.2%	2.1%	4.6%
Grey heron		1	1	1	2.3%	3.6%	3.7%
Little egret		0	1	1	0.0%	0.7%	0.5%
Cormorant		0	1	1	0.0%	0.2%	0.3%
Water rail		0	0	0	0.0%	0.0%	1.4%
Moorhen		4	6	7	2.7%	13.1%	13.8%
Coot		31	31	21	2.7%	11.9%	7.7%
Oystercatcher	A	1	4	5	0.0%	0.1%	0.1%
Avocet	Q	0	49	67	0.0%	2.0%	2.6%
Lapwing	A	15	730	1184	0.1%	4.4%	7.8%
Ringed plover	A	0	68	26	0.0%	9.3%	2.5%
Little ringed plover		0	1	1	0.0%	18.2%	20.0%
Curlew	A	61	66	86	1.4%	2.5%	3.4%
Bar-tailed godwit	Q	0	1	1	0.0%	0.1%	0.1%
Black-tailed godwit	Q	50	1524	1712	1.3%	33.5%	30.3%
Turnstone	A	1	4	5	0.2%	1.8%	1.6%
Knot	Q	1	2	2	0.0%	0.0%	0.0%
Ruff	Q	0	0	0	0.0%	0.2%	0.3%
Dunlin	Q	87	326	432	0.5%	2.0%	2.5%
Snipe		0	1	2	0.0%	1.1%	2.2%
Common sandpiper		0	0	1	0.0%	0.6%	1.4%
Redshank	Q	83	116	113	1.6%	4.0%	4.2%

* Q = qualifying species, A = assemblage species.

7.30. The BTO Low Tide Counts from 2011-12 (the most recent available data as no further BTO low tide surveys have been undertaken since 2012) are summarised in Table 5. It should be noted that these surveys did not cover the main mid-winter period, which may also explain the lower numbers of some species in comparison with the other data sets.

Table 5. BTO Low Tide Count totals for the Killingholme Marshes Foreshore sector (CH066), 2011-12.

Species	01/10 /11	01/03/ 12	01/04/ 12	01/05/ 12	01/06 /12	01/07 /12	01/08 /12	01/09 /12	PEAK
Greylag Goose	0	2	2	4	0	0	0	0	**4**
Shelduck	0	12	2	1	2	0	0	0	**12**
Mallard	3	2	2	4	7	0	0	5	**7**
Teal	11	4	0	0	0	0	0	0	**11**
Grey Heron	0	0	0	0	1	0	2	0	**2**
Little Egret	0	1	0	0	2	2	2	0	**2**
Cormorant	2	0	0	0	0	0	2	0	**2**
Moorhen	0	0	1	1	0	1	0	0	**1**
Oystercatcher	0	0	0	0	1	0	0	2	**2**
Avocet	0	2	5	0	0	0	0	0	**5**
Little Ringed Plover	0	0	0	0	0	0	1	0	**1**
Curlew	4	3	0	0	0	0	0	0	**4**
Black-tailed Godwit	0	0	0	0	0	0	2000	650	**2000**
Redshank	0	0	0	0	1	0	0	0	**1**
Black-headed Gull	0	0	0	0	3	4	0	0	**4**
Common Tern	0	0	0	0	0	1	0	0	**1**

JBA Data

7.31. The results of the 2017-18 JBA surveys are summarised in Table 6 for the Killingholme Marshes Foreshore (KMFS). The Table gives peak count recorded each month.

Table 6. Monthly peak counts from Killingholme Marshes Foreshore, September 2017- May 2018 (Source: JBA 2019).

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Greylag goose	0	0	21	16	12	2	17	11	5	21
Pink-footed goose	0	0	0	0	0	0	0	0	0	0
Mute swan	0	0	0	0	0	0	0	1	0	1
Shelduck	5	168	102	105	64	74	96	41	20	168
Shoveler	0	0	4	0	0	0	0	0	0	4
Gadwall	0	0	0	0	0	0	0	0	0	0
Wigeon	0	125	0	0	0	0	0	0	0	125
Mallard	1	3	2	0	0	0	0	3	0	3
Teal	29	310	298	71	122	173	133	32	0	310
Pochard	0	0	0	0	0	0	0	0	0	0
Little grebe	0	0	0	0	0	0	0	0	0	0
Grey heron	1	0	1	1	0	0	0	0	0	1

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Little egret	0	2	1	0	0	0	0	1	0	2
Cormorant	0	0	3	0	0	1	2	1	0	3
Marsh harrier	0	0	0	0	0	0	0	0	0	0
Oystercatcher	0	0	0	0	0	0	7	7	7	7
Avocet	0	36	16	0	0	15	34	15	4	36
Lapwing	0	200	212	342	665	233	18	2	1	665
Grey plover	0	45	0	0	0	0	0	0	0	45
Ringed plover	33	18	0	0	0	5	11	39	28	39
Whimbrel	0	0	0	0	0	0	0	0	0	0
Curlew	4	35	70	60	65	119	136	30	2	136
Bar-tailed godwit	0	0	5	0	0	0	0	0	0	5
Black-tailed godwit	362	267	24	0	6	2	1	0	538	538
Turnstone	2	17	26	0	0	0	1	0	0	26
Knot	0	0	67	0	0	0	0	0	0	67
Ruff	0	0	0	0	0	0	0	0	0	0
Sanderling	0	0	0	0	0	0	0	0	0	0
Dunlin	18	376	503	156	501	12	80	26	42	503
Little stint	0	3	0	0	0	0	0	0	0	3
Snipe	0	3	5	1	0	0	0	0	0	5
Redshank	70	806	284	292	370	135	115	111	0	806
Greenshank	0	2	0	0	0	0	0	0	0	2

ABP DATA 2018-19 and 2019-20

7.32. Data were obtained from ABP from their monitoring surveys undertaken over several sites, including KMFS. The recent data from 2018-19 and 2019-20 for KMFS are summarised in Table 7, which gives the monthly peak counts over this survey period, and the annual peaks for each of the two years. Of particular note are the higher numbers of teal, lapwing and avocet than recorded in the baseline surveys for the original DCO application.

Table 7. ABP Survey Data for Killingholme Marshes Foreshore sector, October-March 2018-19 and 2019-20: monthly peak counts and annual peaks.

Species	Oct	Nov	Dec	Jan	Feb	Mar	Peak 2018-19	Peak 2019-20
Greylag goose	0	25	27	0	3	6	**0**	**27**
Mute swan	4	0	0	0	0	0	**4**	**0**
Shelduck	31	44	56	48	51	76	**76**	**56**
Wigeon	0	2	0	0	4	0	**0**	**4**
Mallard	22	3	0	0	1	10	**22**	**10**
Teal	413	915	510	828	1064	888	**1064**	**828**
Little egret	1	0	0	0	0	0	**1**	**0**
Cormorant	4	3	2	1	2	1	**0**	**4**
Oystercatcher	0	0	0	0	2	8	**8**	**4**
Avocet	251	33	23	0	76	152	**104**	**251**

Species	Oct	Nov	Dec	Jan	Feb	Mar	Peak 2018-19	Peak 2019-20
Lapwing	65	372	1642	1550	2374	6	**2374**	**1254**
Golden plover	0	0	0	0	1	0	**0**	**1**
Grey plover	1	0	0	0	0	0	**0**	**1**
Ringed plover	24	16	1	3	6	7	**19**	**24**
Curlew	49	62	96	68	63	63	**68**	**96**
Bar-tailed godwit	0	0	2	3	14	0	**2**	**14**
Black-tailed godwit	2183	22	220	162	372	271	**2070**	**2183**
Turnstone	12	37	1	2	7	8	**17**	**37**
Sanderling	0	0	0	0	0	2	**0**	**2**
Dunlin	455	512	659	680	381	136	**680**	**512**
Snipe	4	0	15	5	0	0	**4**	**15**
Redshank	184	140	156	170	117	204	**204**	**140**

Able Data 2020-21

7.33. The data collected for Able UK by Nick Cutts during December 2020 – March 2021 from the Killingholme Marshes Foreshore are summarised in Table 8, where the total counts from each survey are presented. The surveys commenced in December 2020, so no data were available from autumn 2020, though the autumn period is covered in other years by the other data sets described in this section. As for the ABP surveys, higher peak numbers of teal, lapwing and avocet were recorded in this area than previously.

Table 8. Count totals Killingholme Marshes Foreshore sector, December 2020- March 2021 (Source: Nick Cutts). *Note: partial coverage of north end of sector only during Dec-Jan).*

Species	09/12/2020	23/12/2020	07/01/2021	21/01/2021	04/02/2021	18/02/2021	05/03/2021	PEAK
Greylag Goose	0	0	0	0	0	13	0	13
Shelduck	8	0	2	0	20	34	13	34
Mallard	2	2	14	4	13	4	8	14
Teal	1466	994	470	520	431	212	354	1466
Oystercatcher	0	0	0	0	0	0	13	13
Avocet	0	0	0	0	0	0	205	205
Lapwing	980	950	310	1121	240	0	0	1121
Golden Plover	0	0	0	0	14	0	0	14
Ringed Plover	0	2	0	0	0	0	0	2
Curlew	6	3	11	2	28	26	29	29
Black-tailed Godwit	0	0	0	0	170	0	0	170
Dunlin	75	35	40	0	22	232	10	232
Redshank	13	71	42	7	53	52	43	71

Able Data 2022-23

7.34. The Killingholme Marshes foreshore held a range of important wintering waterbird populations during the October 2022-March 2023 surveys, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit, curlew and redshank (Table 9).

Table 9. Peak counts of the autumn/winter non-breeding bird populations within the Killingholme Marsh Foreshore.

Species	Day peak count	Night peak count	% SPA (qualifying and assemblage species)
Whooper Swan	3	48	-
Pink-footed Goose	40	10	0.2%
Greylag Goose	24	0	-
Canada Goose	1	5	-
Shelduck	10	2	0.2%
Wigeon	1	2	0.1%
Gadwall	2	0	-
Teal	1666	358	31.5%
Mallard	14	2	1.3%
Tufted Duck	45	0	-
Cormorant	3	0	-
Little Egret	2	1	-
Grey Heron	1	3	-
Marsh Harrier	1	0	-
Sparrowhawk	1	0	-
Buzzard	2	0	-
Peregrine	1	0	-
Water Rail	1	0	-
Oystercatcher	5	0	0.1%
Avocet	220	2	8.5%
Grey Plover	2	0	0.1%
Lapwing	956	38	6.3%
Dunlin	205	346	2.0%
Snipe	5	2	-
Black-tailed Godwit	3313	75	58.7%
Curlew	84	47	3.3%
Spotted Redshank	1	0	-
Redshank	147	74	5.5%
Common Gull	34	0	-
Lesser Black-backed Gull	2	0	-
Herring Gull	20	1	-
Great Black-backed Gull	8	0	-
Black-headed Gull	17	150	-
Kingfisher	1	0	-

North Killingholme Haven Pits

BTO WeBS Data

7.35. Table 10 summarises the most recently available five-year mean peak counts from the North Killingholme Haven Pits, giving the peak for each winter, the mean peak over the last five years, and the % that this comprises of the whole Humber Estuary population over the same period.

Table 10. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the North Killingholme Haven Pits sector and and the percentage this makes up of whole Humber Estuary SPA, 2017/18 - 2021/22..

Species	SPA sp.*	2017/18	2018/19	2019/20	2020/21	2021/22	Mean peak	% SPA
Mute Swan		2	0	0	0	1	0.6	0.4%
Greylag Goose		11	16	6	2	3	7.6	0.4%
Canada Goose		0	0	0	0	4	0.8	0.1%
Shelduck	Q	13	24	10	7	16	14	0.2%
Teal	A	133	16	58	61	95	73	1.4%
Mallard	A	8	16	23	24	12	16.6	1.5%
Shoveler		34	5	0	8	0	9.4	3.2%
Pochard	A	0	0	0	0	0	0	0.0%
Little Grebe		0	0	0	0	1	0.2	0.4%
Cormorant		1	0	0	1	0	0.4	0.1%
Bittern	Q	0	0	0	0	1	0.2	6.7%
Little Egret		7	8	4	5	7	6.2	3.1%
Grey Heron		2	2	1	1	1	1.4	3.7%
Water Rail		1	1	0	0	1	0.6	4.3%
Moorhen		1	0	0	0	0	0.2	0.4%
Coot		0	0	0	0	0	0	0.0%
Oystercatcher	A	2	3	1	2	2	2	0.0%
Avocet	Q	12	45	205	286	122	134	5.2%
Ringed Plover	A	1	0	2	1	0	0.8	0.1%
Golden Plover	Q	0	0	0	1	0	0.2	0.0%
Grey Plover	A	0	0	0	2	0	0.4	0.0%
Lapwing	A	128	360	246	2580	548	772	5.1%
Knot	Q	0	0	420	1050	22	298	1.1%
Curlew Sandpiper		0	0	4	0	0	0.8	8.9%
Dunlin	Q	180	45	2950	1290	165	926	5.3%
Ruff	Q	7	0	0	0	0	1.4	1.8%
Snipe		52	9	102	25	15	41	37.9%
Black-tailed Godwit	Q	3810	2770	5400	2950	3700	3726	66.0%
Bar-tailed Godwit	Q	0	0	0	0	1	0.2	0.0%
Curlew	A	3	7	4	23	4	8.2	0.3%
Common Sandpiper		0	1	0	0	0	0.2	0.5%
Green Sandpiper		0	0	0	0	1	0.2	1.7%
Spotted Redshank		0	0	0	0	3	0.6	1.9%
Greenshank	A	0	0	0	1	0	0.2	0.4%
Redshank	Q	157	251	220	320	92	208	7.8%
Turnstone	A	0	0	1	0	0	0.2	0.1%

* Q = qualifying species, A = assemblage species.

7.36. Table 11 compares the NKHP WeBS five-year mean peak counts presented in the original ES (2004/05 – 2008/09), for the Material Change 2 (2015/16-2019/20) and for the most recently available five years (2017/18 – 2021/22). The Table also gives the percentages that these comprised of the whole Humber Estuary population for each time period. Overall, there have been no notable changes in any species' status since the Material Change 2 application.

Table 11. Five-year BTO Wetland Bird Survey (WeBS) core high tide mean peak count for the North Killingholme Haven Pits sector and % of the whole Humber Estuary for 2004/05 - 2008/09 (as presented in the original ES), for 2015/16 – 2019/20 (Material Change 2) and for the most recent five winters (2017/18 – 2021/22) (Time Extension).

Species	SPA sp.*	5-year mean peak ES (04-08)	5-year mean peak MC2 (15-19)	5-year mean peak TE (17-21)	% SPA mean peak ES	% SPA mean peak MC2	% SPA mean peak TE
Mute Swan		1	1	1	0.2%	0.5%	0.4%
Greylag Goose		0	25	8	0%	1.6%	0.4%
Canada Goose		1	0	1	0.1%	0.0%	0.1%
Shelduck	Q	7	9	14	0.1%	0.2%	0.2%
Gadwall		<1	0	0	0.3%	0.0%	0.0%
Teal	A	30	43	73	1.1%	1.2%	1.4%
Mallard	A	71	13	17	3.4%	1.2%	1.5%
Shoveler		29	8	9	23.4%	3.7%	3.2%
Tufted Duck		1	0	0	0.2%	0.0%	0.0%
Little Grebe		1	0	<1	0.9%	0.0%	0.4%
Cormorant		1	<1	<1	1.0%	0.1%	0.1%
Bittern	Q	0	0	<1	0.0%	0.0%	6.7%
Little Egret		0	5	6	0.0%	2.2%	3.1%
Grey Heron		3	1	1	7.7%	3.6%	3.7%
Water Rail		0	<1	1	0.0%	2.5%	4.3%
Moorhen		3	<1	<1	1.8%	0.4%	0.4%
Coot		3	0	0	0.2%	0.0%	0.0%
Oystercatcher	A	2	2	2	0.0%	0.0%	0.0%
Avocet	Q	27	54	134	5.4%	2.2%	5.2%
Ringed Plover		1	1	1	0.1%	0.1%	0.1%
Lapwing	A	276	288	772	1.6%	1.8%	5.1%
Knot	Q	0	84	298	0.0%	0.4%	1.1%
Curlew Sandpiper		0	1	1	0.0%	8.0%	8.9%
Dunlin	Q	390	663	926	2.2%	4.2%	5.3%
Ruff	Q	1	1	1	1.6%	1.7%	1.8%
Jack Snipe		<1	0	0	5.9%	0.0%	0.0%
Snipe		4	33	41	3.4%	25.4%	37.9%
Black-tailed Godwit	Q	3338	3336	3726	85.9%	73.4%	66.0%
Curlew	A	12	4	8	0.3%	0.1%	0.3%
Common Sandpiper		0	<1	<1	0.0%	0.6%	0.5%
Green Sandpiper		0	0	<1	0.0%	0.0%	1.7%
Spotted Redshank		0	0	1	0.0%	0.0%	1.9%
Greenshank	A	0	0	<1	0.0%	0.0%	0.4%
Redshank	Q	215	230	208	4.2%	8.0%	7.8%
Turnstone	A	0	<1	<1	0.0%	0.1%	0.1%

* Q = qualifying species, A = assemblage species.

7.37. The BTO Low Tide Counts from 2011-12 (the most recent available data as no further BTO low tide surveys have been undertaken since 2012) for the NKHP sector are summarised in Table 12. These show lower peak count than WeBS core counts for probably reflecting the timing of the counts at low, rather than high, tide (NKHP is generally more important as a high tide roost), though high numbers of black-tailed godwit were also seen during the low tide counts of that sector. It should be noted that these surveys did not cover the main mid-winter period, which may also explain the lower numbers of some species in comparison with the other data sets.

Table 12. BTO Low Tide Count totals for the North Killingholme Haven Pits sector (CH017), 2011-12.

Species	01/10 /11	01/03/ 12	01/04/ 12	01/05/ 12	01/06 /12	01/07 /12	01/08 /12	01/09 /12	PEAK
Shelduck	120	89	61	78	138	54	51	72	**138**
Gadwall	0	2	0	0	0	0	0	0	**2**
Mallard	0	8	6	4	10	0	10	5	**10**
Teal	0	6	0	0	0	0	0	0	**6**
Great Crested Grebe	0	0	0	0	1	0	0	0	**1**
Cormorant	0	0	0	0	2	0	0	0	**2**
Oystercatcher	0	8	12	2	8	9	5	0	**12**
Avocet	0	8	0	0	0	0	0	0	**8**
Lapwing	0	0	0	0	0	0	0	3	**3**
Golden Plover	0	0	0	0	0	2	0	0	**2**
Ringed Plover	0	2	0	4	0	0	0	0	**4**
Curlew	22	109	4	13	76	106	88	42	**109**
Bar-tailed Godwit	0	35	0	0	0	0	0	0	**35**
Black-tailed Godwit	530	219	0	0	288	816	1	21	**816**
Turnstone	0	0	0	0	0	0	1	0	**1**
Dunlin	289	0	3	0	0	0	0	71	**289**
Common Sandpiper	0	0	0	0	0	1	2	0	**2**
Redshank	33	38	17	2	0	23	3	17	**38**
Black-headed Gull	0	5	1	0	37	100	203	94	**203**
Great Black-backed Gull	0	0	2	2	2	7	0	0	**7**
Herring Gull	0	0	0	8	0	2	0	3	**8**
Lesser Black-backed Gull	0	0	0	0	0	0	1	4	**4**

JBA Data

7.38. The results of the 2017-18 JBA surveys for North Killingholme Haven Pits (NKHP) are summarised in Table 13. The Table gives peak count recorded each month.

Table 13. Monthly peak counts from North Killingholme Haven Pits, September 2017- May 2018 (Source: JBA 2019).

Species	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	PEAK
Greylag goose	5	0	1	7	16	0	0	3	12	**16**
Pink-footed goose	0	100	0	0	0	0	0	0	0	**100**
Mute swan	0	0	0	0	0	0	1	1	0	**1**
Shelduck	0	3	0	0	3	0	6	5	8	**8**
Shoveler	0	0	0	0	0	0	1	4	0	**4**
Gadwall	0	0	0	0	0	2	0	0	0	**2**
Wigeon	0	0	0	0	0	0	0	0	0	**0**
Mallard	9	7	40	18	15	4	8	2	0	**40**
Teal	2	29	24	53	104	23	45	24	0	**104**
Pochard	0	0	0	2	4	0	0	0	0	**4**
Little grebe	0	0	0	0	0	0	5	0	0	**5**
Grey heron	0	1	2	2	1	0	1	1	1	**2**
Little egret	10	8	4	0	0	0	5	9	4	**10**
Cormorant	0	0	0	3	3	0	1	0	0	**3**
Marsh harrier	0	1	0	0	0	0	1	1	0	**1**
Oystercatcher	0	0	0	0	0	0	2	2	2	**2**
Avocet	3	23	44	0	0	0	33	8	2	**44**
Lapwing	100	180	269	202	38	5	11	0	0	**269**
Grey plover	0	0	0	0	0	0	0	0	0	**0**
Ringed plover	0	0	0	0	0	0	0	0	0	**0**
Whimbrel	0	0	0	0	0	0	0	0	0	**0**
Curlew	2	4	4	2	0	0	1	0	0	**4**
Bar-tailed godwit	0	0	0	0	0	0	2	0	0	**2**
Black-tailed godwit	655	500	2	0	0	0	0	20	1	**655**
Turnstone	0	0	0	0	0	0	0	0	0	**0**
Knot	0	0	0	0	0	0	0	0	0	**0**
Ruff	0	2	0	0	0	0	0	0	0	**2**
Sanderling	0	0	12	0	0	0	0	0	0	**12**
Dunlin	20	450	32	24	0	0	0	0	0	**450**
Little stint	0	0	0	0	0	0	0	0	0	**0**
Snipe	0	24	18	9	8	26	0	12	0	**26**
Redshank	0	450	112	24	12	2	227	160	0	**450**
Greenshank	0	0	0	0	0	0	0	0	0	**0**

Able Data 2022-23

7.39. The North Killingholme Haven Pits held a range of important wintering waterbird populations during the October 2022-March 2023 surveys, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit and redshank (Table 14).

Table 14. Peak counts of the autumn/winter non-breeding bird populations within the North Killingholme Haven Pits during the day and night counts, October 2022 - March 2023.

Species	Day peak count	Night peak count	% SPA (qualifying and assemblage species)
Greylag Goose	2	39	2.2%
Canada Goose	2	0	0.3%
Shelduck	7	4	0.1%
Gadwall	2	0	0.8%
Teal	196	75	3.7%
Mallard	206	8	18.6%
Shoveler	1	0	0.3%
Tufted Duck	1	0	0.4%
Goldeneye	2	0	0.7%
Little Grebe	1	0	1.8%
Cormorant	1	0	0.2%
Little Egret	2	1	1.0%
Grey Heron	1	2	5.3%
Marsh Harrier	1	0	>1%
Water Rail	1	0	7.1%
Oystercatcher	2	0	0.0%
Avocet	175	6	6.8%
Ringed Plover	1	0	0.1%
Lapwing	340	0	2.2%
Dunlin	22	2	0.1%
Snipe	9	1	8.4%
Black-tailed Godwit	3650	2955	64.6%
Curlew	24	12	0.9%
Redshank	181	290	10.9%
Common Gull	7	0	0.5%
Lesser Black-backed Gull	2	0	1.9%
Herring Gull	5	0	0.4%
Black-headed Gull	290	340	2.6%

Summary of Baseline Survey Data

7.40. The data sources on waterbird numbers within the area that could be affected by the proposed development are summarised in Tables 15 (Killingholme Marshes and Foreshore) and 16 (North Killingholme Haven Pits), which give the peak count for each key species from each source. Overall, there is broad agreement between the sources with regard to the important waterbird populations in this zone, i.e. shelduck, teal, avocet, lapwing, ringed plover, curlew, bar-tailed godwit, black-tailed godwit, dunlin and redshank were all recorded regularly in important numbers in the context of the SPA/Ramsar site. 'Important' numbers were identified on the basis of the proportion of the SPA/Ramsar population recorded using the area regularly exceeding 1%. Whilst peak numbers of some other species did on some occasions exceed this 1% criterion, the large majority of records were of numbers well below this threshold, so were not, applying professional judgement, deemed to be 'important' in this context.

7.41. Though most of the new baseline survey data were obtained through the main winter period (and hence did not cover the late spring or early autumn passage periods), these periods were covered by the WeBS data update and this is not considered to have had any material effect on the conclusions reached.

7.42. There are some changes apparent since the original AMEP application, notably a recent increase in peak counts of teal, lapwing and avocet on the Killingholme Marshes Foreshore. The site has continued to be of major importance for black-tailed godwits. The North Killingholme Haven Pits has also continued to be a very important site for black-tailed godwits (primarily as a high tide roost), and has continued to support a range of other waterbird species, though with no major changes apparent in comparison with the original DCO application baseline.

Table 15. Overall peak waterbird counts for the Killingholme Marshes Foreshore

Species	**SPA sp**	**ES TTTC**	**ES WeBS**	***% Humber ES***	**WeBS Core 15-19**	**WeBS Low 11-12**	**Other 17-21**	**% Humber MC2**	**WeBS Core 17-21**	**Able 22-23**	***% Humber TE***
Whooper swan		0	0	*0.0%*	0	0	0	*0.0%*	0	48	59.3%
Mute swan		2	3	*1.0%*	2	0	4	*2.7%*	3	0	2.1%
Brent goose	A	0	0	*0.0%*	0	0	0	*0.0%*	0	0	0.0%
Canada goose		0	0	*0.0%*	0	0	0	*0.0%*	0	5	0.7%
Greylag goose		0	0	*0.0%*	0	0	27	*1.7%*	0	24	1.3%
Pink-footed goose		0	0	*0.0%*	0	0	0	*0.0%*	0	40	0.2%
Shelduck	Q	109	9	*2.4%*	75	138	168	*3.7%*	69	10	1.1%
Shoveler		0	11	*8.9%*	53	0	4	*24.7%*	63	0	21.4%
Gadwall		0	4	*2.9%*	21	2	0	*9.6%*	38	2	15.3%
Wigeon	A	24	0	*0.7%*	0	0	125	*4.7%*	0	2	0.1%
Mallard	A	14	13	*0.7%*	45	10	22	*4.3%*	77	14	6.9%
Teal	A	12	13	*0.5%*	0	6	1466	*39.6%*	378	1666	31.5%
Pochard	A	0	1	*0.3%*	0	0	0	*0.0%*	0	0	0.0%
Tufted duck		0	4	*1.0%*	2	0	0	*0.7%*	2	45	18.3%
Scaup	A	0	0	*0.0%*	0	0	0	*0.0%*	0	0	0.0%
Goldeneye	A	0	0	*0.0%*	0	0	0	*0.0%*	0	0	0.0%
Smew		0	1	*50.0%*	0	0	0	*0.0%*	0	0	
Great crested grebe		0	0	*0.0%*	0	1	0	*4.3%*	0	0	0.0%
Little grebe		0	2	*2.2%*	1	0	0	*2.1%*	3	0	4.6%
Grey heron		0	1	*2.3%*	0	0	1	*3.0%*	1	3	7.9%
Little egret		0	0	*0.0%*	1	0	2	*1.0%*	1	2	1.0%
Cormorant		2	0	*1.4%*	1	2	4	*1.2%*	1	3	0.7%
Water rail		0	0	*0.0%*	0	0	0	*0.0%*	0	1	7.1%
Moorhen		0	4	*2.7%*	6	0	0	*13.1%*	7	0	13.8%
Coot		2	31	*2.7%*	31	0	0	*11.9%*	21	0	7.7%
Oystercatcher	A	12	1	*0.4%*	4	12	13	*0.2%*	5	5	0.1%
Avocet	Q	0	0	*0.0%*	49	8	251	*10.1%*	67	220	8.5%
Lapwing	A	325	15	*1.8%*	0	3	2374	*14.4%*	1184	956	7.8%
Golden plover	Q	0	0	*0.0%*	0	2	14	*0.0%*	0	0	0.0%
Grey plover	A	0	0	*0.0%*	0	0	45	*1.5%*	0	2	0.1%
Ringed plover	A	210	0	*17.0%*	68	4	39	*9.3%*	26	0	2.5%

Species	SPA sp	ES TTTC	ES WeBS	*% Humber ES*	WeBS Core 15-19	WeBS Low 11-12	Other 17-21	% Humber MC2	WeBS Core 17-21	Able 22-23	*% Humber TE*
Little ringed plover		0	0	*0.0%*	1	0	0	*18.2%*	1	0	20.0%
Whimbrel	A	2	0	*2.8%*	0	0	0	*0.0%*	0	0	0.0%
Curlew	A	158	61	*3.7%*	66	109	136	*5.1%*	86	84	3.4%
Bar-tailed godwit	Q	123	0	*4.4%*	1	35	14	*2.4%*	1	0	0.1%
Black-tailed godwit	Q	2566	50	*66.0%*	1524	816	2183	*48.0%*	1712	3313	58.7%
Turnstone	A	0	1	*0.2%*	4	1	37	*15.5%*	5	0	1.6%
Knot	Q	0	1	*0.0%*	2	0	67	*0.4%*	2	0	0.0%
Ruff	Q	1	0	*1.6%*	0	0	0	*0.2%*	0	0	0.3%
Sanderling	A	0	0	*0.0%*	0	0	2	*0.3%*	0	0	0.0%
Dunlin	Q	1029	87	*5.7%*	326	289	680	*4.3%*	432	346	2.5%
Little stint		0	0	*0.0%*	0	0	3	*46.9%*	0	0	0.0%
Snipe		0	0	*0.0%*	1	0	15	*11.7%*	2	5	4.7%
Common sandpiper		3	0	*12.0%*	0	2	0	*5.8%*	1	0	1.4%
Redshank	Q	540	83	*10.5%*	116	38	806	*28.0%*	113	147	5.5%
Spotted redshank		0	0	*0.0%*	0	0	0	*0.0%*	0	1	3.2%
Greenshank	A	0	0	*0.0%*	0	0	2	*4.3%*	0	0	0.0%

Table 16. Overall peak waterbird counts for the North Killingholme Haven Pits.

Species	SPA sp	ES TTTC	ES WeBS	*% Humber ES*	WeBS Core 15-19	WeBS Low 11-12	JBA 17-18	*% Humber MC2*	WeBS Core 17-21	Able 22-23	*% Humber TE*
Canada goose		0	1	0.2%	0	0	0	0.0%	1	2	0.3%
Greylag goose		0	0	0.0%	0	4	16	1.0%	8	39	2.2%
Pink-footed goose		0	0	0.0%	0	0	100	0.8%	0	0	0.0%
Mute swan		1	1	0.3%	1	0	1	0.7%	1	0	0.4%
Shelduck	Q	9	7	0.2%	9	12	8	0.3%	14	7	0.2%
Shoveler		61	29	49.5%	8	0	4	3.7%	9	1	3.2%
Gadwall		0	0	0.0%	0	0	2	0.9%	0	2	0.8%
Mallard	A	34	71	3.4%	13	7	40	3.8%	17	206	18.6%
Teal	A	46	30	1.7%	0	11	104	2.8%	73	196	3.7%
Pochard	A	0	0	0.0%	0	0	4	5.0%	0	0	0.0%
Tufted duck		1	1	0.2%	0	0	0	0.0%	0	1	0.4%
Goldeneye	A	0	0	0.0%	0	0	0	0.0%	0	2	0.7%
Smew		1	0	50.0%	0	0	0	0.0%	0	0	
Little grebe		0	1	1.1%	0	0	5	10.3%	0	1	1.8%
Bittern	Q	0	0	0.0%	0	0	0	0.0%	0	0	6.7%
Grey heron		3	3	6.8%	0	2	2	6.1%	1	2	5.3%
Little egret		1	0	2.6%	5	2	10	4.9%	6	2	3.1%
Cormorant		1	1	0.7%	0	2	3	0.9%	0	1	0.2%
Marsh harrier	Q	0	0		0	0	1		0	1	*>1%*
Water rail		2	0	33.3%	0	0	0	2.5%	1	1	7.1%
Moorhen		4	2	2.7%	0	1	0	2.0%	0	0	0.4%

Species	SPA sp	ES TTTC	ES WeBS	% *Humber ES*	WeBS Core 15-19	WeBS Low 11-12	JBA 17-18	% *Humber MC2*	WeBS Core 17-21	Able 22-23	% *Humber TE*
Coot		2	3	0.3%	0	0	0	0.0%	0	0	0.0%
Oystercatcher	A	4	2	0.1%	2	2	2	0.0%	2	2	0.0%
Avocet	Q	16	27	5.3%	54	5	44	2.2%	134	175	6.8%
Lapwing	A	5	276	1.6%	0	0	269	1.6%	772	340	5.1%
Golden plover	Q	1	0	<0.1%	0	0	0	0.0%	0	0	0.0%
Ringed plover		0	1	0.1%	1	0	0	0.1%	1	1	0.1%
Little ringed plover		2	0	52.6%	0	1	0	22.7%	0	0	0.0%
Curlew	A	7	12	0.3%	4	4	4	0.2%	8	24	0.9%
Bar-tailed godwit	Q	1	0	0.0%	0	0	2	0.1%	0	0	0.0%
Black-tailed godwit	Q	3800	3338	97.8%	3336	2000	655	73.4%	3726	3650	66.0%
Turnstone	A	0	0	0.0%	0	0	0	0.1%	0	0	0.1%
Knot	Q	12	0	0.0%	84	0	0	0.4%	298	0	1.1%
Ruff	Q	0	1	1.6%	1	0	2	2.5%	1	0	1.8%
Sanderling	A	0	0	0.0%	0	0	12	2.1%	0	0	0.0%
Dunlin	Q	270	380	2.1%	663	0	450	4.2%	926	22	5.3%
Little stint		0	0	0.0%	0	0	0	0.0%	0	0	0.0%
Snipe		6	4	5.1%	33	0	26	25.4%	41	9	37.9%
Common sandpiper		0	0	0.0%	0	0	0	0.6%	0	0	0.5%
Redshank	Q	249	215	4.8%	230	1	450	15.6%	208	290	10.9%
Greenshank	A	0	0	0.0%	0	0	0	0.0%	0	0	0.4%

7.43. The Supporting Habitats that could be affected by the Project include:

- Coastal lagoons
- Freshwater and coastal grazing marsh
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal sand and mudflats
- *Salicornia* and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Water column

8. Assessment of Potential for Likely Significant Effect

8.1. The Project will result in a range of likely environmental impacts including, during construction:

- Direct loss of intertidal habitat within the Humber Estuary SPA/Ramsar/SAC through construction of project infrastructure;
- Indirect Loss of intertidal habitat within the Humber Estuary SPA/Ramsar/SAC;
- Loss of fish habitat within the Humber Estuary SPA/Ramsar/SAC;
- Loss of terrestrial habitat functionally linked to the Humber Estuary SPA/Ramsar/SAC;
- Disturbance to birds, fish and marine mammals (noise and visual);
- Underwater noise disturbance affecting fish and marine mammals;
- Dredging and other construction effects on water quality;
- Disposal of dredge spoil.
- Cumulative effects.

8.2. Environmental impacts during operation will likely include:

- Disturbance to birds (noise and visual)
- Maintenance dredging impacts, including boat disturbance;
- Lighting impacts
- Maintenance dredging;

8.3. The habitat losses that would occur as a result of the Time Extension are given in Table 13. This gives the loss of area from the current proposed Time Extension, the original consented scheme (the losses predicted in the original ES are given in UES11-2 'Change in Habitat Losses within the Designated Site') and the consented Material Change 2. The Time Extension would give the same habitat loss as the consented Material Change 2.

Table 13. Habitat loss from the consented and the updated Projects.

Loss	Habitat Type	Description	Area (ES)	Area (MC2)	Area (TE)	Notes
Direct - reclamation to construct quay	1130	Estuaries	13.5	10.4	10.4	Within the reclamation site. The set back berth has reduced the area of subtidal loss
	1140/1310	Mudflat/sandflat not covered by seawater at low tide Mudflat with pioneer saltmarsh	31.5	31.3	31.3	Within the reclamation site - supports a range of waterfowl. Quay redesign for MC2 has led to slightly reduced loss.
	1330	Saltmarsh	0	1.9	1.9	New loss as this community has recently colonised this area.
Indirect functional loss through disturbance	1140/1310	Mudflat/sandflat not covered by seawater at low tide. Mudflat with pioneer saltmarsh	11.6	7.7	7.7	To the south of the reclamation site - potentially disturbed by operational activity on the quay following completion of construction (275m disturbance zone)

Loss	Habitat Type	Description	Area (ES)	Area (MC2)	Area (TE)	Notes
	1330	Saltmarsh	0	4.7	4.7	New loss as this community has recently colonised this area.
Compensation Area Changes	1330	Saltmarsh	1.8	2.0	2.0	At Cherry Cobb Sands to form the channel across the foreshore from the existing flood defence to Cherry Cobb Sands Creek - this habitat would become mudflat offsetting the loss of Habitat type 1140. Area increased from 1.8 to 2ha in SoCG.

8.4. There would be no change in the extent of the noise disturbance resulting from the proposed Time Extension.

8.5. Pressures identified by Natural England in their Advice on Operations relating to 'Construction of Port and Harbour Structures' comprise the following:

8.6. Medium-high risk

- Above water noise
- Abrasion/disturbance of the substrate on the surface of the seabed
- Barrier to species movement
- Changes in suspended solids (water clarity)
- Emergence regime changes, including tidal level change considerations
- Habitat structure changes - removal of substratum (extraction)
- Introduction of light
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Physical change (to another seabed type)
- Physical change (to another sediment type)
- Physical loss (to land or freshwater habitat)
- Removal of non-target species
- Smothering and siltation rate changes (Heavy)
- Smothering and siltation rate changes (Light)
- Underwater noise changes
- Vibration
- Visual disturbance
- Water flow (tidal current) changes, including sediment transport considerations
- Wave exposure changes

8.7. Low Risk

- Collision above water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)

- Collision below water with static or moving objects not naturally found in the marine environment
- Deoxygenation
- Hydrocarbon & PAH contamination
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of invasive non-indigenous species (INIS)
- Nutrient enrichment
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)
- Transition elements & organo-metal (e.g. TBT) contamination

8.8. Pressures identified by Natural England in their Advice on Operations relating to 'Operation of Ports and Harbours' comprise the following:

Medium-high risk

- Introduction of light

Low Risk

- Above water noise
- Abrasion/disturbance of the substrate on the surface of the seabed
- Barrier to species movement
- Changes in suspended solids (water clarity)
- Collision above water with static or moving objects not naturally found in the marine environment (e.g., boats, machinery, and structures)
- Collision below water with static or moving objects not naturally found in the marine environment
- Hydrocarbon & PAH contamination
- Introduction of other substances (solid, liquid or gas)
- Introduction or spread of invasive non-indigenous species (INIS)
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Smothering and siltation rate changes (Light)
- Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)
- Transition elements & organo-metal (e.g. TBT) contamination
- Underwater noise changes
- Visual disturbance

8.9. Medium-high risks are described by Natural England as follows: "Pressure is commonly induced by activity at a level that needs to be considered further as part of an assessment"; and low risks as "Unless there are evidence based case or site specific factors that increase the risk, or uncertainty on the level of pressure on a receptor, this pressure generally does not occur at a level of concern and should not require consideration as part of an assessment."

8.10. All of these have been considered during the LSE assessment. Assessment matrices are given in Appendices 4 and 5 (which have taken into account consideration of all these risks for each qualifying species/feature, particularly those identified as 'medium-high'). These impacts will be

investigated in further detail during the appropriate assessment stage, for the qualifying features for the species/populations where LSE could not be ruled out.

9. Screening Statement

9.1. The only European Protected Natura 2000 sites that could be affected by the proposed development are the Humber Estuary SPA, the Humber Estuary Ramsar site and the Humber Estuary SAC.

9.2. This screening statement updates the one presented in the original 2011 application (agreed with the Applicant, Natural England and the MMO in the Statement of Common Ground on Shadow Habitats Regulations Assessment (HRA SoCG)[11]) and the one that formed part of the Material Change 2 application (agreed in that SoCG[12]).

9.3. That agreed approach determined that there could be LSE for all species that occurred in numbers ≥1% of the Humber Estuary population, and will be affected by loss/changes in habitat and/or disturbance.

9.4. No LSE was concluded in the original consented application for the following species:

- Not recorded by Through-The-Tide-Count surveys at KMFS/NKHP – arctic tern, barnacle goose, Bewick's swan, bittern, black-throated diver, brent goose, common scoter, common tern, curlew sandpiper, eider, great white egret, garganey, goosander, green sandpiper, greenshank, greylag goose, goldeneye, great crested grebe, hen harrier, jack snipe, kittiwake, little stint, long-tailed duck, little tern, pink-footed goose, pintail, red-throated diver, roseate tern, sanderling, shag, scaup, spotted redshank, whooper swan, wood sandpiper, woodcock.
- Not reliant on habitats at KMFS /NKHP – black-headed gull, common gull, coot, grey heron, herring gull, gadwall, great black-backed gull, lesser black-backed gull and Mediterranean gull.
- Species that although they occurred in numbers ≥ 1% their ecology makes them resilient to impacts (e.g. through their use of cover at NKHP) - moorhen, snipe.
- Only one or two birds recorded by TTTC, or percentage of Humber Estuary population recorded is so low as to be insignificant – Canada goose, cormorant, golden plover, grey plover, little ringed plover, little grebe, little egret, knot, mute swan, oystercatcher, pochard, ruff, smew, tufted duck, turnstone, water rail, whimbrel, wigeon and yellow-legged gull.

9.5. LSE was excluded for the loss of sub-tidal habitat in respect of the SPA and the bird interests of the Ramsar site, as none of the bird species significantly affected are reliant on the sub-tidal habitat.

9.6. LSE was also excluded in respect of the effects of lighting on the remaining intertidal habitats at KMFS (given the location and effect of the lighting shown on the figures in Supplementary Information EX19.1 - Lighting Lux Plans[13]).

[11] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001606-SOCG009%20TR030001%20Able%20Humber%20Ports%20Ltd%20Statement%20of%20Common%20Ground%20with%20Natural%20England%20and%20the%20Marine%20Management%20Organisation.pdf

[12] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000496-(TR030006.D6.SOCG.NE)%20Statement%20of%20Common%20Ground%20with%20Natural%20England.pdf

[13] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001612-OS-003_TR030001_Able%20UK%20Ltd_Supplementary%20Environmental%20Information_File%202%20of%202.zip

9.7. LSE on birds was excluded in respect of the construction of the compensation site at Cherry Cobb Sands and the loss of the arable fields, on the basis that there will be no difference between the existing situation and the proposed situation (i.e. SPA birds still being able to utilise arable land adjacent to the compensation site) and work will only be undertaken between April to October when bird numbers are lowest and environmental conditions (food availability, daylight length and temperatures) most benign. Effects will be further mitigated by the diversion of the footpath, and screening of the existing intertidal habitats provided by the existing embankment.

9.8. In-combination effects were concluded not to occur for the remaining non-LSE bird species for one of the following reasons:

- they were not reliant on the habitats lost (including coot, heron and gadwall);
- there were only records of one or two birds; or
- they occurred in a such a small percentage of the Humber Estuary population as to be insignificant.

Update to baseline for Material Change 2 Application

9.9. Whilst there were some population changes since the original consent was issued, including increased numbers of teal, lapwing and avocet using the Killingholme Marshes Foreshore, in terms of the criteria agreed for LSE in the SoCG, there were no additional species reaching the originally agreed criteria for potential LSE for the Material Change 2 application.

Update to baseline for proposed Time Extension

9.10. The baseline bird surveys carried out since the Material Change 2 application have recorded very similar distribution and abundance as those for that application. The increases in teal, lapwing and avocet have been sustained but there have been no major changes. .In terms of the criteria agreed for LSE in the 2011 SoCG, there were no additional species reaching the originally agreed criteria for potential LSE.

9.11. The Likely Significant Effect tests for the Humber Estuary SPA are summarised in Appendix 4.

Supporting Habitat Loss

9.12. There would be a direct loss of intertidal habitat within the SPA along the south shore of the river Humber through the construction of AMEP (see Table 13 above). As any direct loss of SPA supporting habitat would be considered as an LSE, this has been taken forward for Appropriate Assessment. The Supporting Habitats that could be affected by the Project include:

- Coastal lagoons
- Freshwater and coastal grazing marsh
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal sand and mudflats
- Salicornia and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Water column

9.13. There has been a change in the baseline habitat at Killingholme foreshore since the original application, with an ongoing process of accretion followed by saltmarsh colonisation, though this does not have an adverse effect on the quantum of habitat compensation, and changes since

the Material Change 2 will have been negligible given the short time since that consent (in July 2022).

Additional Ramsar Qualifying Features

9.14. The Ramsar citation does not identify any additional ornithological qualifying features.

9.15. Non-avian Ramsar features include river lamprey, sea lamprey and grey seals (which are also features of the Humber Estuary SAC) and natterjack toad. LSE could not be ruled out for grey seal, sea lamprey and river lamprey, so these have been taken forward for Appropriate Assessment.

SAC

9.16. The Likely Significant Effect tests for the Humber Estuary SAC are summarised in Appendix 5. The following LSE are identified:

- Permanent direct loss of estuarine habitat (H1130)
- Permanent direct loss of intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)
- Permanent direct loss of saltmarsh (H1330)
- Indirect effects on estuarine habitat (H1130).
- Indirect effects on intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)
- Indirect effects on saltmarsh (H1330)
- Disturbance to grey seal, sea lamprey and river lamprey (S1364 and S1099).

In-combination Effects

9.17. The qualifying interest habitats listed on the Humber Estuary SAC citation for which LSE was not identified for AMEP alone (e.g. sandbanks which are slightly covered by the sea at all times and various dune communities) will not be affected at all by AMEP, and hence an in-combination assessment for them is not necessary (this remains the same position as agreed for the consented DCO statement of common ground (ERM 2012) and for the consented DCO statement of common ground for the Material Change 2).

9.18. The SPA qualifying bird species for which LSE was not identified for AMEP alone were largely species that were not recorded as part of site-specific surveys or only records infrequently/in trivial numbers, and hence will not be affected at all by AMEP. In-combination ornithological effects were also concluded for the consented DCO and for the Material Change 2 not to occur because either (a) they were not reliant on the habitats lost (e.g. gull species recorded and others such as coot, heron and gadwall); or (b) there were only records of one or two birds; or they occurred in a such a small percentage of the Humber Estuary population as to be insignificant. That remains the case for the proposed Time Extension.

Transboundary Screening

9.19. It was concluded in the original application (in the Planning Inspectorate Transboundary Screening Matrix[14]) that transboundary issues required notification under Regulation 24 of the

[14] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001351-120816_Able_Transboundary%20Screening%20Matrix.pdf

EIA Regulations, with Iceland identified as the country to be notified. That was unchanged for the proposed Material Change 2 and remains unchanged as a result of proposed Time Extension.

Conclusion

9.20. The previous assessment of LSE for the Project in 2012 concluded LSE on the grounds set out in Table 3.3 of the HRA SoCG, and agreed at paragraph 3.6.7 (*ibid*), for the following species:

Qualifying Species:

- Avocet;
- Marsh harrier;
- Bar-tailed godwit;
- Black-tailed godwit;
- Dunlin;
- Redshank;
- Knot; and
- Shelduck.

Additional Assemblage Species:

- Curlew;
- Lapwing;
- Mallard
- Ringed plover;
- Shoveler; and
- Teal.

Supporting Habitat:

- Coastal lagoons
- Freshwater and coastal grazing marsh
- Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)
- Intertidal sand and mudflats
- *Salicornia* and other annuals colonising mud and sand
- Saltmarsh (Atlantic salt meadows)
- Water column

9.21. With regard to the potential effects on the Humber SAC, the following features have been identified for which LSE cannot be ruled out, and therefore require Appropriate Assessment:

- Estuarine habitats;
- Intertidal mudflats;
- *Salicornia* and other annuals colonising mud and sand;
- Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*);
- Grey seal;
- Sea lamprey; and

- River lamprey.

9.22. The HRA carried out for the Material Change 2 reached the same conclusion and that LSE could not be ruled out for the same list of species and features.

9.23. The proposed Time Extension and minor changes to the baseline ornithological and ecological conditions since the Material Change 2 application do not make any difference to this conclusion.

9.24. Further information to inform the Appropriate Assessment will be provided as a separate report.

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APPENDIX 1: HUMBER ESTUARY SPA CITATION

EC Directive 79/409 on the Conservation of Wild Birds

Name: Humber Estuary

Unitary Authorities/Counties: City of Kingston-upon-Hull, East Riding of Yorkshire, Lincolnshire, North East Lincolnshire, North Lincolnshire

Component SSSIs: The SPA encompasses all or parts of the following Sites of Special Scientific Interest (SSSIs): Humber Estuary SSSI, North Killingholme Haven Pits SSSI, Saltfleetby-Theddlethorpe Dunes SSSI, and The Lagoons SSSI.

Site description: The Humber Estuary is located on the east coast of England, and comprises extensive wetland and coastal habitats. The inner estuary supports extensive areas of reedbed, with areas of mature and developing saltmarsh backed by grazing marsh in the middle and outer estuary. On the north Lincolnshire coast, the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. Parts of the estuary are owned and managed by conservation organisations. The estuary supports important numbers of waterbirds (especially geese, ducks and waders) during the migration periods and in winter. In summer, it supports important breeding populations of bittern *Botaurus stellaris*, marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and little tern *Sterna albifrons*.

Size of SPA: The SPA covers an area of 37,630.24 ha.

Qualifying species:

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

Annex I species	Count and season	Period	% of GB population
Avocet *Recurvirostra avosetta*	59 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7%
Bittern *Botaurus stellaris*	4 individuals – wintering	5 year peak mean 1998/99 – 2002/03	4.0%
Hen harrier *Circus cyaneus*	8 individuals – wintering	5 year peak mean 1997/98 – 2001/02	1.1%
Golden plover *Pluvialis apricaria*	30,709 individuals – wintering	5 year peak mean 1996/97 – 2000/01	12.3%
Bar-tailed godwit *Limosa lapponica*	2,752 individuals – wintering	5 year peak mean 1996/97 – 2000/01	4.4%
Ruff *Philomachus pugnax*	128 individuals – passage	5 year peak mean 1996-2000	1.4%
Bittern *Botaurus stellaris*	2 booming males – breeding	3 year mean 2000-2002	10.5%
Marsh harrier *Circus aeruginosus*	10 females – breeding	5 year mean 1998-2002	6.3%
Avocet *Recurvirostra avosetta*	64 pairs – breeding	5 year mean 1998 – 2002	8.6%
Little tern *Sterna albifrons*	51 pairs – breeding	5 year mean 1998-2002	2.1%

The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	Count and season	Period	% of subspecies/ population
Shelduck *Tadorna tadorna*	4,464 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.5% Northwestern Europe (breeding)
Knot *Calidris canutus*	28,165 individuals – wintering	5 year peak mean 1996/97 – 2000/01	6.3% *islandica*
Dunlin *Calidris alpina*	22,222 individuals – wintering	5 year peak mean 1996/97 – 2000/01	1.7% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	1,113 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.2% *islandica*
Redshank *Tringa totanus*	4,632 individuals – wintering	5 year peak mean 1996/97 – 2000/01	3.6% *brittanica*
Knot *Calidris canutus*	18,500 individuals – passage	5 year peak mean1996 – 2000	4.1% *islandica*
Dunlin *Calidris alpina*	20,269 individuals – passage	5 year peak mean1996 – 2000	1.5% *alpina*, Western Europe (non-breeding)
Black-tailed godwit *Limosa limosa*	915 individuals – passage	5 year peak mean 1996 – 2000	2.6% *islandica*
Redshank *Tringa totanus*	7,462 individuals – passage	5 year peak mean1996 – 2000	5.7% *brittanica*

Bird counts from: Wetland Bird Survey (WeBS) database and The Humber Estuary: A comprehensive review of its nature conservation interest (Allen et al. 2003).

Assemblage qualification:

The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 153,934 individual waterbirds (five year peak mean 1996/97 – 2000/01), including dark-bellied brent goose *Branta bernicla bernicla*, shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca*, mallard *Anas platyrhynchos*, pochard Aythya ferina, scaup Aythya marila, goldeneye Bucephala clangula, bittern *Botaurus stellaris*, oystercatcher *Haematopus ostralegus*, avocet *Recurvirostra avosetta*, ringed plover *Charadrius hiaticula*, golden plover *Pluvialis apricaria*, grey plover *P. squatarola*, lapwing *Vanellus vanellus*, knot *Calidris canutus*, sanderling *C. alba*, dunlin *C. alpina*, ruff *Philomachus pugnax*, black-tailed godwit *Limosa limosa,* bar-tailed godwit *L. lapponica*, whimbrel *Numenius phaeopus*, curlew *N. arquata*, redshank *Tringa totanus*, greenshank *T. nebularia* and turnstone *Arenaria interpres*.

Non-qualifying species of interest: The SPA is used by non-breeding merlin Falco columbarius, peregrine F. peregrinus and short-eared owl *Asio flammeus*, and breeding common tern *Sterna hirundo* and kingfisher *Alcedo atthis* (all species listed in Annex I to the EC Birds Directive) in numbers of less than European importance (less than 1% of the GB population).

Status of SPA:

Humber Flats, Marshes and Coast (Phase 1) SPA was classified on 28 July 1994.

The extended and renamed Humber Estuary SPA was classified on 31 August 2007.

APPENDIX 2: HUMBER ESTUARY RAMSAR SITE CITATION

Site: Humber Estuary
Coordinates: 053 32 59 N, 000 03 25 E Area: 37,988 ha

The Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and is the site of the largest single input of freshwater from Britain into the North Sea. It has the second-highest tidal range in Britain (max 7.4 m) and approximately one-third of the estuary is exposed as mud or sand flats at low tide. The inner estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed in places by limited areas of grazing marsh in the middle and outer estuary. On the north Lincolnshire coast the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The Estuary regularly supports internationally important numbers of waterfowl in winter and nationally important breeding populations in summer.

Ramsar criterion 1
The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. It is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Examples of both strandline, foredune, mobile, semi-fixed dunes, fixed dunes and dune grassland occur on both banks of the estuary and along the coast. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers. The lower saltmarsh of the Humber is dominated by common cordgrass *Spartina anglica* and annual glasswort *Salicornia* communities. Low to mid marsh communities are mostly represented by sea aster *Aster tripolium*, common saltmarsh grass *Puccinellia maritima* and sea purslane *Atriplex portulacoides* communities. The upper portion of the saltmarsh community is atypical, dominated by sea couch Elytrigia atherica (*Elymus pycnanthus*) saltmarsh community. In the upper reaches of the estuary, the tidal marsh community is dominated by the common reed Phragmites australis fen and sea club rush *Bolboschoenus maritimus* swamp with the couch grass *Elytrigia repens (Elymus repens*) saltmarsh community. Within the Humber Estuary Ramsar site there are good examples of four of the five physiographic types of saline lagoon.

Ramsar criterion 3
The Humber Estuary Ramsar site supports a breeding colony of grey seals *Halichoerus grypus* at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*.

Ramsar criterion 5
Assemblages of international importance:
153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001)
Ramsar criterion 6 – species/populations occurring at levels of international importance.

Common shelduck, *Tadorna tadorna*
Northwestern Europe (breeding) population
4,464 individuals, wintering, representing an average of 1.5% of the population (5 year peak mean 1996/7-2000/1)

Eurasian golden plover, *Pluvialis apricaria*
altifrons subspecies – NW Europe, W Continental Europe, NW Africa population 30,709 individuals, wintering, representing an average of 3.3% of the population (5 year peak mean 1996/7-2000/1)

Red knot, *Calidris canutus*
islandica subspecies
28,165 individuals, wintering, representing an average of 6.3% of the population (5 year peak mean 1996/7-2000/1)

Dunlin, *Calidris alpina*
alpina subspecies – Western Europe (non-breeding) population
22,222 individuals, wintering, representing an average of 1.7% of the population (5 year peak mean 1996/7-2000/1)

Black-tailed godwit, *Limosa limosa islandica* subspecies
1,113 individuals, wintering, representing an average of 3.2% of the population (5 year peak mean 1996/7-2000/1)

Bar-tailed godwit , *Limosa lapponica lapponica* subspecies
2,752 individuals, wintering, representing an average of 2.3% of the population (5 year peak mean 1996/7-2000/1)

Common redshank, *Tringa totanus brittanica* subspecies
4,632 individuals, wintering, representing an average of 3.6% of the population (5 year peak mean 1996/7-2000/1)

Ramsar criterion 8
The Humber Estuary acts as an important migration route for both river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* between coastal waters and their spawning areas.

APPENDIX 3 HUMBER ESTUARY SAC CITATION

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name: Humber Estuary

Unitary Authority/County: City of Kingston upon Hull, East Riding of Yorkshire, Lincolnshire, North East Lincolnshire, North Lincolnshire

SAC status: Designated on 10 December 2009

Grid reference: TA345110

SAC EU code: UK0030170

Area (ha): 36657.15

Component SSSI: Humber Estuary

Site description:

The Humber is the second largest coastal plain **Estuary** in the UK, and the largest coastal plain estuary on the east coast of Britain. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. The range of salinity, substrate and exposure to wave action influences the estuarine habitats and the range of species that utilise them; these include a breeding bird assemblage, winter and passage waterfowl, river and sea lamprey, grey seals, vascular plantsand invertebrates.

The Humber is a muddy, macro-tidal estuary, fed by a number of rivers including the Rivers Ouse, Trent and Hull. Suspended sediment concentrations are high, and are derived from a variety of sources, including marine sediments and eroding boulder clay along the Holdernesscoast. This is the northernmost of the English east coast estuaries whose structure and function is intimately linked with soft eroding shorelines. The extensive mud and sand flats support a range of benthic communities, which in turn are an important feeding resource for birds and fish. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers.

Habitats within the Humber Estuary include **Atlantic salt meadows** and a range of sand dunetypes in the outer estuary, together with **Sandbanks which are slightly covered by sea water all the time**, extensive intertidal mudflats, ***Salicornia* and other annuals colonising mud and sand**, and **Coastal lagoons**. As salinity declines upstream, reedbeds and brackish saltmarsh communities fringe the estuary. These are best-represented at the confluence of the Rivers Ouse and Trent at Blacktoft Sands.

Upstream from the Humber Bridge, the navigation channel undergoes major shifts from northto south banks, for reasons that have yet to be fully explained. This section of the estuary is also noteworthy for extensive mud and sand bars, which in places form semi-permanent islands. The sand dunes are features of the outer estuary on both the north and south banks particularly on Spurn peninsula and along the Lincolnshire coast south of Cleethorpes.

Examples of both **Fixed dunes with herbaceous vegetation (`grey dunes`)** and **Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes)** occur on both banksof the estuary and along the coast. Native sea buckthorn **Dunes with *Hippophae rhamnoides*** also occurs on both sides of the estuary.

Significant fish species include **river lamprey** *Lampetra fluviatilis* and **sea lamprey** *Petromyzon marinus* which breed in the River Derwent, a tributary of the River Ouse. **Greyseals** *Halichoerus grypus* come ashore in autumn to form breeding colonies on the sandy shores of the south bank at Donna Nook.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) asit hosts the following habitats listed in Annex I:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Coastal lagoons*
- Dunes with *Hippophae rhamnoides*
- Embryonic shifting dunes
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide

- Fixed dunes with herbaceous vegetation (`grey dunes`)*
- *Salicornia* and other annuals colonising mud and sand
- Sandbanks which are slightly covered by sea water all the time
- Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes')

Qualifying species: The site is designated under **article 4(4)** of the Directive (92/43/EEC) asit hosts the following species listed in Annex II:

- Grey seal *Halichoerus grypus*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*

Annex I priority habitats are denoted by an asterisk (*)

Appendix 4. Humber Estuary SPA and Ramsar site species and habitats and their exposure to risk of any effect from the AMEP proposed Time Extension[15]. Q = qualifying species (as per SPA citation and/or SPA Review), A = assemblage species (as listed in SPA Review and citation, jncc.defra.gov.uk).

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[16] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Avocet (breeding and wintering)	Q		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Bittern (breeding and wintering)	Q						Only seen in potential impact zone infrequently in low numbers, no LSE
Hen harrier (wintering)	Q						Only seen in potential impact zone infrequently in low numbers, no LSE
Golden plover (wintering)	Q	Q					Only seen in potential impact zone infrequently in low numbers, no LSE
Bar-tailed godwit (wintering)	Q	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Ruff (passage)	Q						Only seen in potential impact zone infrequently in low numbers, no LSE
Marsh harrier (breeding)	Q		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.

[15] This Table relates only to the proposed Time Extension and therefore only to the AMEP site. There would be no change to the Cherry Cobb Sands compensation site (and no effect of the Time Extension on that site) so that has not been considered as part of the assessment summarised here.

[16] Potential impact zone was defined as the site plus a precautionary buffer of 300m buffer (to exceed the maximum likely disturbance to the most sensitive species, curlew, for which a 275m disturbance zone was agreed in the SoCG), though consideration was also given to effects over a wider area as appropriate (e.g wider effects on seals and fish).

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[16] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Little tern (breeding)	Q						Not present in potential impact zone, no LSE
Shelduck (wintering)	Q	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Knot (wintering and passage)	Q	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Dunlin (wintering and passage)	Q	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Black-tailed godwit (wintering and passage)	Q	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Redshank (wintering and passage)	Q	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out
Brent goose (non-breeding)	A						Only seen in potential impact zone very infrequently in low numbers, no LSE
Wigeon (non-breeding)	A						Only seen in potential impact zone very infrequently in low numbers, no LSE
Teal (non-breeding)	A		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out
Mallard (non-breeding)	A		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[16] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Shoveler (non-breeding)	A		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out
Pochard (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Scaup (non-breeding)	A						Only seen in potential impact zone very infrequently in low numbers, no LSE
Goldeneye (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Oystercatcher (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Ringed Plover (non-breeding)	A	Q	✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Grey plover (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Lapwing (non-breeding)	A		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.
Sanderling (non-breeding)	A	Q					Only seen in potential impact zone infrequently in low numbers, no LSE
Whimbrel (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Curlew (non-breeding)	A		✓	✓	✓	✓	Regularly present in potential impact zone in non-trivial numbers, LSE cannot be ruled out.

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[16] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
Greenshank (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Turnstone (non-breeding)	A						Only seen in potential impact zone infrequently in low numbers, no LSE
Grey seal		Q		✓	✓	✓	
River lamprey		Q		✓	✓	✓	
Sea lamprey		Q		✓	✓	✓	
Natterjack toad		Q					No suitable habitat in potential impact zone, no LSE
Coastal lagoons				✓	✓	✓	
Freshwater and coastal grazing marsh				✓	✓	✓	
Inland areas of wet grassland, rough grassland and agricultural land (both arable land and permanent pasture)				✓	✓	✓	
Intertidal sand and mudflats				✓	✓	✓	
Salicornia and other annuals				✓	✓	✓	

Species	Humber Estuary SPA	Humber Estuary Ramsar site	Present within potential impact zone[16] of project in 'non-trivial' numbers	Consented scheme LSE	Material change LSE	Time Extension LSE	Comments
colonising mud and sand							
Saltmarsh (Atlantic salt meadows)				✓	✓		
Water column				✓	✓		
Other supporting habitats							No direct or indirect loss, so no LSE

Appendix 5. Summary of Like Significant Effects on the Humber Estuary SAC resulting from the consented scheme (including the Material Change) and the proposed Tiem Extension[17].

Potential Effect	Significance of Effect on SAC Qualifying Interest Features (Original ES)	Material Change 2	Proposed time extension
Permanent direct loss of estuarine habitat (H1130)	**Likely Significant Effect** due to losses of habitat under the footprint of the new quay, effects on sea and river lamprey and the effects of capital and maintenance dredging and disposal. Appropriate Assessment (AA) required.	No change - LSE	No change - LSE
Permanent direct loss of intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)	**Likely Significant Effect** predominantly due to losses caused by the new quay. Effects of dredging and disposal as per estuarine habitat above. AA required.	No change - LSE	No change - LSE
Permanent direct loss of saltmarsh (H1330)	**Likely Significant Effect** due to loss of saltmarsh for breach on compensation site. AA required.	No change - LSE. Additional loss of saltmarsh will occur as result of colonisation of reclamation area	No change - LSE.
Indirect effects on estuarine habitat (H1130).	**Likely Significant Effect** with changes in the composition of the estuarine habitats present to the north and south of the quay. AA required.	No change - LSE	No change - LSE
	No Likely Significant Effect has been concluded about the effects on sub-tidal habitat for lamprey, the effects of the compensation site at CCS on the hydrodynamics of the estuary and the effects on water temperatures of the relocation of the power station outfall pipes for reasons listed below.	No change - no LSE	No change - no LSE
	No likely significant effects on sea or river lamprey due to the small indirect changes (see *Annex B*).	No change - no LSE	No change - no LSE
	Relocation of the outfalls to the front of the new quay will change the thermal plume, but there will be no significant changes to the temperatures of the receiving water (*EX9.7 – Assessment of the Relocation of the E.ON and Centrica Outfalls on Thermal Recirculation*), The relocation has yet to be agreed with E.ON and Centrica, however, the receiving water will be no warmer with AMEP even if the outfalls remain in their current location.	No change - no LSE	No change - no LSE

[17] This Table relates only to the proposed Time Extension and therefore only to the AMEP site. There would be no change to the Cherry Cobb Sands compensation site (and no effect of the Material Change on that site) so that has not been considered as part of the assessment summarised here.

Potential Effect	Significance of Effect on SAC Qualifying Interest Features (Original ES)	Material Change 2	Proposed time extension
Indirect effects on intertidal mudflat and mudflat with pioneer saltmarsh (H1140/1310)	**Likely Significant Effect** predominantly due to changes in habitat to the north and south of the new quay and geomorphological changes due to rise in water levels. AA required.	No change - LSE	No change - LSE
	No Likely Significant Effect has been concluded about the effects of erosion at the breach location of the compensationsite at CCS and due to the discharge from the pumping station and increased wave heights due to the new quay. The reasons are set out below.	No change - no LSE	No change - no LSE
	Downstream of the breach at the compensation site, erosion and enlargement of the CCS Creek is predicted withincreases predominantly in the depth of the creek and also its width closer to the breach, although it will remain unchanged at the *"downstream"* location (Black & Veatch, 2012[1]).	No change - no LSE	No change - no LSE
	A channel will be initiated by dredging a short section of intertidal habitat seaward of the pumping station (see *Tables 12.2* and *12.3* of the SoCG for the ES), so there will be no significant erosion effects.	No change - no LSE	No change - no LSE
	Increased wave heights due to the new quay will be small and localised and any erosion resulting will be offset by accretion resulting from the sheltering effect of the quay as described in *Supplementary Information EX 8.7 Modelling ofFinal Quay Design*.	No change - no LSE	No change - no LSE
Indirect effects on saltmarsh (H1330)	**Likely Significant Effect** due to the transformation of existing habitat types into saltmarsh (see *Annex B*). AA required.	No change - LSE	No change - LSE
Disturbance to grey seal, sea and river lamprey (S1364 and S1099)	**Likely Significant Effect** as piling for the new quay construction will create underwater noise which could affect grey seal and migratory movements of sea and river lamprey. AA required.	No change - LSE	No change - LSE