

Able Marine Energy Park: Article 7 Extension of Time

Habitats Regulations Assessment Report

Part 2: Information to Inform an Appropriate Assessment

DRAFT FOR CONSULTATION

Ecology Consulting Report to Able UK Ltd

February 2024

1. Executive Summary

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 a Natura 2000/National Site Network site 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).

Part 1 of the HRA report concluded that the Able Marine Energy Park (AMEP) project would have Likely Significant Effects (LSE) on eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, redshank and shelduck) and on six of the wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal).

LSE was also recorded for seven features of the Humber Estuary SAC/Ramsar site (estuarine habitats, intertidal mudflats, *Salicornia* and other annuals colonising mud and sand, Atlantic sea meadows (*Glauco-Puccinallietalia maritima*), grey seal, sea lamprey and river lamprey).

This report, forming Part 2 of the HRA, provides the competent authority with the information required to assess and review the information and make its determination of effect for an Appropriate Assessment.

It is concluded that the Project Time Extension would continue to adversely affect the ecological integrity of the Humber Estuary SPA and Ramsar site, and the Humber Estuary SAC. Since the original HRA was carried out, the area of mudflat lost has reduced in size as it has converted to saltmarsh. The new quay alignment consented for the Material Change 2 also slightly reduced the total area of habitat lost compared to the original scheme. Given that there would be no change to the proposed development from the Time Extension and that there have been no subsequent major changes to the ecological baseline, the Time Extension would have the same effects as the Material Change 2. The compensation proposals remain the same and so it is concluded that the adverse effect on integrity would continue to be adequately compensated and mitigated by the measures already proposed.

2. Introduction and Background

- 2.1. This report forms part of the application for a Time Extension to the consented Able Marine Energy Park (referred to hereafter as the 'Project'). It addresses the nature conservation issues raised by the Project, specifically concerning the Conservation of Habitats and Species Regulations 2017, the 'Habitats Regulations'. It comprises the second part of the information to inform the Habitat Regulations Assessment (HRA) for the Project, and provides information required to inform an Appropriate Assessment of the likely significant effects previously identified (in the Part 1 LSE Test) on relevant sites of international nature conservation importance (i.e. the Humber Estuary SPA/Ramsar site/SAC).
- 2.2. Part 1 of the HRA report, the Likely Significant Effect report, concluded that the Project had the potential to affect the Humber Estuary SPA/Ramsar site/SAC but no others. It concluded Likely Significant Effects on eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, redshank, shelduck and redshank) and on six of the wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal). LSE was also concluded for seven features of the Humber Estuary SAC; 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.
- 2.3. As a result, it is necessary to undertake an Appropriate Assessment under the Habitats Regulations with regard to those Likely Significant Effects identified for these species. Sufficient information must be provided to allow the competent authority to assess and review the information and make its own determination of effect for an Appropriate Assessment. This report provides the required information. It reviews the Appropriate Assessments carried out for the original DCO application and for the Material Change 2 in light of the proposed Time Extension and any changes that have occurred in the baseline ecological conditions.

3. Legislative Framework

- 3.1. Under the Habitats Regulations, a development that is likely to significantly affect an SPA or SAC site requires Appropriate Assessment under Regulation 63 of those Regulations. As a matter of government policy, such a requirement also extends to Ramsar sites in England.
- 3.2. The first test under the Habitats Regulations is whether the development is likely to have a significant effect on a protected site, either alone or in combination with other plans or projects. This includes consideration of LSEs on any of the populations of importance for which the protected site has been designated. If it is, as determined by the competent authority, then the authority must make an appropriate assessment of the implications of the development for that site in view of the site's conservation objectives. In this context ecological integrity is defined in "Managing Natura 2000 Sites" (European Communities 2000) as:

"the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified"
- 3.3. In Part 1 of the HRA report it was concluded that the proposed Project could result in Likely Significant Effects on the Humber Estuary SPA/Ramsar avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, redshank, shelduck, knot, curlew, lapwing, mallard, ringed plover, shoveler and teal populations (together with their 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) and water column).
- 3.4. There would also be LSE for the Humber Estuary SAC/Ramsar, for its (a) estuarine habitats, (b) intertidal mudflats, (c) sandbanks which are slightly covered by seawater all the time; (d) *Salicornia* and other annuals colonising mud and sand; (e) Atlantic sea meadows (*Glaucopuccinallietalia maritimae*); (f) grey seal, (g) sea lamprey and (h) river lamprey populations.

4. Scope of this assessment

- 4.1. The scope of this report is to provide the information required to allow the competent authority to assess and review the information and make its own determination of effect for an Appropriate Assessment.
- 4.2. The first part of the HRA report identified the following features of the Humber Estuary SPA/Ramsar/SAC populations for which LSE could not be ruled out, and therefore require Appropriate Assessment:

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.
- 4.3. 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.
- 4.4. The likely significant effects identified above are the same habitats and species identified for the original consented scheme and agreed between the Applicant, Natural England and the MMO as recorded in a Statement of Common Ground (SoCG) in August 2012¹, and for the Material Change 2 consented in July 2022.
- 4.5. This second part of the HRA, therefore, focuses on these species and their supporting habitats. The specific likely significant effects on the SAC (as agreed in the SoCG) were as follows:
- The effects of permanent loss of estuarine habitat from the footprint of the development.
 - The effects of capital and maintenance dredging on estuarine habitats and intertidal mudflats.
 - The effects of disposal of dredged material on estuarine habitats and intertidal mudflats.
 - The effects of the permanent direct loss of intertidal mudflat from Killingholme Marshes Foreshore (KMFS), due to the footprint of the development.
 - The effects of the permanent loss of saltmarsh.
 - The effects of indirect habitat changes on qualifying habitats (estuarine habitat, intertidal mudflat and saltmarsh).
 - The effects of underwater noise from piling on the feeding behaviour of grey seals and the migratory movements of river lamprey.
- 4.6. The specific likely significant effects on the SPA (as agreed in the SoCG) were as follows:
- The effects of the permanent direct loss of estuarine and specifically intertidal mudflats from KMFS on waterfowl that it supports.
 - functional loss of 11.6 ha of mudflat habitat as a result of disturbance.
 - The effects on the use of North Killingholme Haven Pits (NKHP) as a roost if the feeding areas on the mudflats at Killingholme Marches Foreshore (KMFS) are lost.
 - The disturbance effects on birds due to piling activities during construction of the new quay.
 - The disturbance effects on birds using NKHP from construction activities other than piling, and operation of AMEP.
 - The effects of loss of terrestrial habitat within the AMEP site at North Killingholme which is used by SPA birds (predominantly curlew).
- 4.7. As for the original DCO and the Material Change 2 assessment, the possibility of 'in combination' effects has been considered in relation to other proposed developments that could affect these SPA species. Consideration of present day in-combination effects is included within this report in relation to whether site integrity might adversely be affected by the Project in combination with any other developments in the region.

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001606-SOCCG009%20TR030001%20Able%20Humber%20Ports%20Ltd%20Statement%20of%20Common%20Ground%20with%20Natural%20England%20and%20the%20Marine%20Management%20Organisation.pdf>

5. Consultation

- 5.1. 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/>.
- 5.2. 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.”

6. Key Ornithological Interests: Baseline Conditions Update relating to SPA species

6.1. This section provides information on the baseline numbers, distribution and behaviour of the 14 bird species that have been taken forward for Appropriate Assessment, examining their use of the baseline survey area (defined to include all the potential impact zone of the development). The data are presented first for the Killingholme Marshes Foreshore and then for North Killingholme Haven Pits.

Killingholme Marshes Foreshore

6.2. Table 1 summarises the annual peak counts from the **British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts**, showing the peak count each month over the most recently available five-year period (2017/18 – 2021/22) for each of the species for which LSE could not be ruled out (other than marsh harrier, which is not covered by the WeBS scheme).

Table 1. BTO WeBS Core High Tide Count Monthly Peak counts 2017-18 – 2021-22, Killingholme Marshes Foreshore

Species	SPA species*	2017/18	2018/19	2019/20	2020/21	2021/22	Mean peak	% SPA
Shelduck	Q	110	58	93	55	27	69	1.1%
Teal	A	376	428	192	463	432	378	7.2%
Mallard	A	41	64	98	68	114	77	6.9%
Shoveler	A	78	70	93	43	31	63	21.4%
Avocet	Q	29	60	131	32	82	67	2.6%
Ringed Plover	A	5	2	22	94	9	26	2.5%
Lapwing	A	397	1930	876	1418	1297	1184	7.8%
Knot	Q	0	0	12	0	0	2	0.0%
Dunlin	Q	245	349	1000	380	187	432	2.5%
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%
Redshank	Q	210	86	145	92	32	113	4.2%

* Q = qualifying species, A = assemblage species.

6.3. Table 2 summarises the monthly pattern of occurrence from the British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts, showing the peak count each month over the most recently available five-year period.

Table 2. BTO WeBS Core Count Monthly Peak counts 2017-18 – 2021-22, Killingholme Marshes Foreshore

Species	Jan	Feb	Mar	Apr	May	Aug	Sep	Oct	Nov	Dec
Shelduck	50	110	93	31	32	2	31	18	24	14
Shoveler	78	47	58	40	10	12	93	10	70	91

Species	Jan	Feb	Mar	Apr	May	Aug	Sep	Oct	Nov	Dec
Mallard	59	43	16	18	22	58	73	43	46	98
Teal	428	273	150	63	0	23	80	298	432	463
Avocet	0	82	131	54	36	42	1	48	2	15
Lapwing	1930	876	22	6	2	32	6	48	317	1418
Ringed Plover	1	1	5	0	94	9	22	2	0	0
Curlew	26	115	56	64	13	48	53	34	97	120
Bar-tailed Godwit	1	0	0	0	0	0	0	0	0	6
Black-tailed Godwit	19	600	1150	580	63	2240	1660	1120	6	2400
Knot	0	0	0	0	0	0	0	12	0	0
Dunlin	245	400	48	0	90	18	680	380	349	1000
Redshank	166	154	58	210	0	52	1	86	124	180

6.4. The **BTO Low Tide Counts** from 2011-12 (the most recent available) are summarised in Table 3.

Table 3. 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
Shelduck	0	12	2	1	2	0	0	0	12
Shoveler	0	0	0	0	0	0	0	0	0
Mallard	3	2	2	4	7	0	0	5	7
Teal	11	4	0	0	0	0	0	0	11
Avocet	0	2	5	0	0	0	0	0	5
Lapwing	0	0	0	0	0	0	0	0	0
Ringed Plover	0	0	0	0	0	0	0	0	0
Curlew	4	3	0	0	0	0	0	0	4
Bar-tailed Godwit	0	0	0	0	0	0	0	0	0
Black-tailed Godwit	0	0	0	0	0	0	2000	650	2000
Knot	0	0	0	0	0	0	0	0	0
Dunlin	0	0	0	0	0	0	0	0	0
Redshank	0	0	0	0	1	0	0	0	1

6.5. The results of the September 2017- May 2018 JBA surveys are summarised in Table 4.

Table 4. 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
Shelduck	5	168	102	105	64	74	96	41	20	168
Shoveler	0	0	4	0	0	0	0	0	0	4
Mallard	1	3	2	0	0	0	0	3	0	3
Teal	29	310	298	71	122	173	133	32	0	310
Marsh Harrier	0	0	0	0	0	0	0	0	0	0
Avocet	0	36	16	0	0	15	34	15	4	36
Lapwing	0	200	212	342	665	233	18	2	1	665
Ringed plover	33	18	0	0	0	5	11	39	28	39
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
Knot	0	0	0	0	0	0	0	0	0	0
Dunlin	18	376	503	156	501	12	80	26	42	503
Redshank	70	806	284	292	370	135	115	111	0	806

ABP DATA 2018-19 and 2019-20

6.6. 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 5, which gives the monthly peak counts over this survey period, and the annual peaks for each of the two years.

Table 5. 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
Shelduck	31	44	56	48	51	76	76	56
Shoveler	0	0	0	0	0	0	0	0
Mallard	22	3	0	0	1	10	22	10
Teal	413	915	510	828	1064	888	1064	828
Marsh Harrier	0	0	0	0	0	0	0	0
Avocet	251	33	23	0	76	152	104	251
Lapwing	65	372	1642	1550	2374	6	2374	1254
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
Knot	0	0	0	0	0	0	0	0
Dunlin	455	512	659	680	381	136	680	512
Redshank	184	140	156	170	117	204	204	140

Able Data 2020-21

6.7. The data collected for Able UK by Nick Cutts during December 2020 – March 2021 from the Killingholme Marshes Foreshore are summarised in Table 6, where the total counts from each survey are presented.

Table 6. 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
Shelduck	8	0	2	0	20	34	13	34
Shoveler	0	0	0	0	0	0	0	0
Mallard	2	2	14	4	13	4	8	14
Teal	1466	994	470	520	431	212	354	1466
Marsh Harrier	0	0	0	0	0	0	0	0
Avocet	0	0	0	0	0	0	205	205
Lapwing	980	950	310	1121	240	0	0	1121
Ringed Plover	0	2	0	0	0	0	0	2
Curlew	6	3	11	2	28	26	29	29
Bar-tailed Godwit	0	0	0	0	0	0	0	0
Black-tailed Godwit	0	0	0	0	170	0	0	170
Knot	0	0	0	0	0	0	0	0
Dunlin	75	35	40	0	22	232	10	232
Redshank	13	71	42	7	53	52	43	71

Able Data 2022-23

6.8. The results of the additional surveys undertaken during the 2022-23 winter for the Killingholme Marshes foreshore are summarised in Table 7. This area continued to support a range of important wintering waterbird populations, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit, curlew and redshank, in similar numbers to those recorded in other previous surveys.

Table 7. Monthly peak counts for the Able UK Ltd daytime counts of the Killingholme Marshes Foreshore sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	10	1	1	2	9	5	10
Wigeon	1	0	0	0	0	0	1
Teal	1666	1166	710	614	553	148	1666
Mallard	14	2	0	2	8	4	14
Shoveler	0	0	0	0	0	0	0
Marsh Harrier	0	1	0	0	0	0	1
Avocet	220	83	0	0	144	120	220
Lapwing	266	526	187	956	622	5	956
Ringed plover	0	0	0	0	0	0	0
Dunlin	80	205	56	147	17	11	205
Bar-tailed godwit	0	0	0	0	0	0	0
Black-tailed Godwit	3091	513	2	1	6	73	3091
Curlew	28	50	47	84	46	44	84
Redshank	115	147	67	50	73	37	147

6.9. Table 8 summarises the results of the night surveys that were undertaken of the Killingholme Marshes foreshore during the 2022-23 winter.

Table 8. Monthly peak counts for the Able UK Ltd night counts of the Killingholme Marshes Foreshore sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	0	0	0	0	0	2	2
Wigeon	0	2	0	0	0	0	2
Teal	218	358	4	212	160	64	358
Mallard	0	2	2	0	0	0	2
Avocet	0	2	0	0	0	1	2
Ringed Plover	0	0	0	0	1	0	1
Lapwing	14	38	0	35	2	3	38
Dunlin	10	346	100	8	33	55	346
Black-tailed Godwit	75	0	0	0	0	0	75
Curlew	11	47	6	1	17	13	47
Redshank	5	74	42	16	74	32	74

Summary of Killingholme Marshes Foreshore Baseline

6.10. The data sources on waterbird numbers within the Killingholme Marshes Foreshore area that could be affected by the proposed development are summarised in Table 9, which gives 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. Symbols in the Table following the species name indicate where there have been notable changes in numbers from the original ES baseline.

6.11. The main changes since the original AMEP DCO application have been higher numbers of teal, lapwing and avocet, which were noted in the Material Change 2 application. There have been no major changes observed since then. The recent increased use of the site by these species is likely to have been influenced by recent changes in the intertidal habitat caused by accretion and consequential saltmarsh colonisation of former mudflat at the site. This has enabled some species to feed longer through the tidal cycle and provides roosting habitat even through high tide states (at least during neap tides). Teal and avocet now use the site for feeding and roosting in higher numbers than previously recorded, and there has been increased use by lapwing, though predominantly for roosting. The site continues to be important for black-tailed godwits for both feeding and roosting, particularly in autumn/early winter, though also in spring.

Table 9. 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
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%
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%
Marsh Harrier	Q		-	>1%	-	-		>1%	-		>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%
Ringed plover	A	210	0	17.0%	68	4	39	9.3%	26	0	2.5%
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%
Knot	Q	0	1	0.0%	2	0	67	0.4%	2	0	0.0%
Dunlin	Q	1029	87	5.7%	326	289	680	4.3%	432	346	2.5%
Redshank	Q	540	83	10.5%	116	38	806	28.0%	113	147	5.5%

* Q = qualifying species, A = assemblage species.

North Killingholme Haven Pits

6.12. Table 10 summarises the annual peak counts from the **British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts** for the North Killingholme Haven Pits, showing the peak count each month over the most recently available five-year period (2017/18 – 2021/22) for each of the species for which LSE could not be ruled out (other than marsh harrier, which is not covered by the WeBS scheme).

Table 10. BTO WeBS Core High Tide Count Monthly Peak counts 2017-18 – 2021-22, North Killingholme Haven Pits

Species	SPA species*	2017/18	2018/19	2019/20	2020/21	2021/22	Mean peak	% SPA
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%
Avocet	Q	12	45	205	286	122	134	5.2%
Ringed Plover	A	0	0	0	1	0	0.2	0.0%
Lapwing	A	128	360	246	2580	548	772	5.1%
Knot	Q	0	0	420	1050	22	298	1.1%
Dunlin	Q	180	45	2950	1290	165	926	5.3%
Bar-tailed Godwit	Q	0	0	0	0	1	0.2	0.0%
Black-tailed Godwit	Q	3810	2770	5400	2950	3700	3726	66.0%
Curlew	A	3	7	4	23	4	8.2	0.3%
Redshank	Q	157	251	220	320	92	208	7.8%

* Q = qualifying species, A = assemblage species.

6.13. Table 11 summarises the monthly pattern of occurrence from the **British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) core counts**, showing the peak count each month over the most recently available five-year period.

Table 11. BTO WeBS Core Count Monthly Peak counts 2017-18 – 2021-22, North Killingholme Haven Pits

Species	Jan	Feb	Mar	Apr	May	Aug	Sep	Oct	Nov	Dec
Shelduck	4	24	11	13	16	0	0	0	0	0
Teal	133	95	67	18	0	1	6	32	86	61
Mallard	16	23	8	3	5	0	0	18	2	7
Shoveler	0	0	0	1	0	0	0	34	0	5
Avocet	0	0	122	38	40	54	205	286	33	5
Ringed Plover	0	0	0	0	0	1	2	1	0	0
Lapwing	48	34	7	0	0	41	128	425	2580	265
Dunlin	0	3	1	2	0	580	1290	2950	72	0
Knot	0	0	0	0	0	570	1050	285	0	0
Bar-tailed Godwit	0	0	0	0	0	0	0	1	0	0
Black-tailed Godwit	0	0	3	3	144	3700	5400	4600	6	0
Curlew	0	4	3	23	2	3	2	4	4	7
Redshank	52	93	251	118	1	265	320	157	87	240

6.14. The **BTO Low Tide Counts** from 2011-12 (the most recent available) for NKHP are summarised in Table 12. This shows generally lower peak count than WeBS core counts, which probably

reflect the timing of the counts at low, rather than high, tide (the pits are more important as a high tide roost than as a low tide feeding area).

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
Shoveler	0	0	0	0	0	0	0	0	0
Mallard	0	8	6	4	10	0	10	5	10
Teal	0	6	0	0	0	0	0	0	6
Marsh Harrier	0	0	0	0	0	0	0	0	0
Avocet	0	8	0	0	0	0	0	0	8
Lapwing	0	0	0	0	0	0	0	3	3
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
Knot	0	0	0	0	0	0	0	0	0
Dunlin	289	0	3	0	0	0	0	71	289
Redshank	33	38	17	2	0	23	3	17	38

6.15. The results of the September 2017- May 2018 JBA surveys are summarised in Table 13.

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
Shelduck	0	3	0	0	3	0	6	5	8	8
Shoveler	0	0	0	0	0	0	1	4	0	4
Mallard	9	7	40	18	15	4	8	2	0	40
Teal	2	29	24	53	104	23	45	24	0	104
Marsh harrier	0	1	0	0	0	0	1	1	0	1
Avocet	3	23	44	0	0	0	33	8	2	44
Lapwing	100	180	269	202	38	5	11	0	0	269
Ringed plover	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
Knot	0	0	0	0	0	0	0	0	0	0
Dunlin	20	450	32	24	0	0	0	0	0	450
Redshank	0	450	112	24	12	2	227	160	0	450

Able Data 2022-23

6.16. The results of the additional surveys undertaken during the 2022-23 winter for the North Killingholme Haven Pits are summarised in Table 14. This area continued to support a range of important wintering waterbird populations, including teal, mallard, avocet, lapwing, dunlin, black-tailed godwit and redshank, in similar numbers to those recorded in previous surveys.

Table 14. Monthly peak counts for the Able UK Ltd daytime counts of the North Killingholme Haven Pits sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	0	0	1	0	4	7	7
Wigeon	0	0	0	0	0	0	0
Teal	196	57	114	148	82	84	196
Mallard	2	4	4	11	206	4	206
Shoveler	0	0	1	0	0	0	1
Marsh Harrier	0	0	1	1	0	0	1
Avocet	175	110	0	0	4	47	175
Ringed Plover	0	1	0	0	0	0	1
Lapwing	49	340	26	4	8	18	340
Dunlin	9	22	1	0	0	0	22
Bar-tailed godwit	0	0	0	0	0	0	0
Black-tailed Godwit	3650	2648	2	0	0	28	3650
Curlew	24	5	0	0	1	2	24
Redshank	181	126	41	94	75	67	181

6.17. Table 15 summarises the results of the night surveys that were undertaken of the North Killingholme Haven Pits during the 2022-23 winter.

Table 15. Monthly peak counts for the Able UK Ltd night counts of the Killingholme Marshes Foreshore sector, October 2022- March 2023 (source: Ecology Consulting).

Species	Oct	Nov	Dec	Jan	Feb	Mar	PEAK
Shelduck	0	0	0	0	0	2	2
Wigeon	0	2	0	0	0	0	2
Teal	218	358	4	212	160	64	358
Mallard	0	2	2	0	0	0	2
Avocet	0	2	0	0	0	1	2
Ringed Plover	0	0	0	0	1	0	1
Lapwing	14	38	0	35	2	3	38
Dunlin	10	346	100	8	33	55	346
Black-tailed Godwit	75	0	0	0	0	0	75
Curlew	11	47	6	1	17	13	47
Redshank	5	74	42	16	74	32	74

Summary of North Killingholme Haven Pits Baseline

6.18. The data sources on waterbird numbers within the North Killingholme Haven Pits that could be affected by the proposed development are summarised in Table 16, which gives 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. Symbols in the Table following the species name indicate where there have been notable changes in numbers from the original DCO baseline.

6.19. The main changes since the original AMEP DCO application generally reflect those for the Killingholme Marshes Foreshore. There have been higher numbers of teal, lapwing, avocet knot and dunlin than recorded in original surveys, which were noted in the Material Change 2 application. No major changes have been observed since then, other than ongoing increases. The site continues to be particularly important for roosting black-tailed godwits, particularly in autumn/early winter.

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
Shelduck	Q	9	7	0.2%	9	12	8	0.3%	14	7	0.2%
Teal ↑	A	46	30	1.7%	0	11	104	2.8%	73	196	3.7%
Mallard ↑	A	34	71	3.4%	13	7	40	3.8%	17	206	18.6%
Shoveler ↓		61	29	49.5%	8	0	4	3.7%	9	1	3.2%
Marsh harrier	Q	0	0		0	0	1	>1%	0	1	>1%
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%
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%
Knot ↑	Q	12	0	0.0%	84	0	0	0.4%	298	0	1.1%
Dunlin ↑	Q	270	380	2.1%	663	0	450	4.2%	926	22	5.3%
Redshank	Q	249	215	4.8%	230	1	450	15.6%	208	290	10.9%

* Q = qualifying species, A = assemblage species.

Terrestrial Fields

6.20. As noted in the original DCO ES (paragraphs 11.5.90 *et seq.*), some of the Killingholme Fields (the terrestrial fields located between the C.Ro Port (formerly Humber Sea Terminal) and Immingham Dock) are regularly used by waterbird species associated with the Humber Estuary. The fields were identified in the original DCO ES as providing functionally linked land for the SPA, particularly for feeding and roosting curlew (with a peak count of 106, or 2.4% of the Humber Estuary population at that time). Redshank, black-tailed godwit, lapwing, redshank, whimbrel, and shelduck were also recorded during the original ES baseline surveys but in numbers below 1% of the Humber Estuary population.

- 6.21. A further survey in autumn 2016 (Cutts and Hemingway 2017²) found reduced curlew numbers present in the AMEP fields than previously (peak 15, equivalent to 0.6% of the Humber population), possibly because of their less favourable condition (with a longer sward developed as arable/improved grassland fields have reverted to neutral grassland). The same study reported a higher use (peak 110 curlew, 4.1% of the Humber population) on grassland on the adjacent operational Tank Farm (outside the AMEP site), over both high and low tide periods, so the species was simply preferring other nearby grassland at the time.
- 6.22. The area of terrestrial fields remaining within the AMEP site, is reducing as the DCO development is being implemented, as reported in the AMEP Monopile Factory ES (North Lincolnshire Council planning reference PA/2021/1525³). Overall, use of this part of the AMEP site by curlew is likely to continue to reduce, but has been mitigated for by the creation of alternative wetland habitat at the Halton Marshes Wet Grassland Mitigation Area (following consent from the Secretary of State to transfer the mitigation measures to this site from the site originally consented).
- 6.23. The results of the 2020-21 surveys of the Killingholme Fields by curlew is summarised in Table 17, which gives the totals from each count from December 2020 through to May 2021. Given the seasonality of curlew occurrence in the general area from other surveys (e.g. WeBS for the Killingholme Marshes Foreshore – see Table 2), it is unlikely that any period of higher curlew counts would have been missed by these surveys. Use of the area by curlew is year-round, though with generally higher numbers recorded in spring (March-April).

Table 17. Counts for the Killingholme Marshes fields, December 2020 - May 2021.

Species	09/12/20	23/12/20	07/01/21	21/01/21	04/02/21	18/02/21	05/03/21	22/03/21	06/04/21	19/04/21	03/05/21	17/05/21
Curlew	10	0	0	1	3	8	32	29	45	7	7	3

- 6.24. Table 18 shows the results of the Killingholme Fields curlew counts made from October 2022 – March 2023. Peak numbers were similar to those recorded in 2020-21, but with those numbers sustained longer through most of the winter.

Table 18. Counts for the Killingholme Marshes fields, October 2022 – March 2023.

Species	11/10/22	26/10/22	02/11/22	16/11/22	30/11/22	29/12/22	16/01/23	01/02/23	26/02/23	15/03/23	27/03/23
Curlew	12	34	46	38	2	24	21	47	12	30	41

- 6.25. Furthermore, curlew use of the KMFS has not increased numerically since the original DCO application (see Tables 9 and 16 above), though the area does hold a higher proportion of the Humber population (5% compared with 3.7% previously), as a result of a decline in the curlew population elsewhere in the estuary.

² Cutts, N. & K. Hemingway. 2017. *Able Curlew Fields and North Killingholme Frontage Ornithological Survey Programme Autumn 2016*. Report to Able UK Ltd. Institute of Estuarine & Coastal Studies, University of Hull.

³ [PA/2021/1525 | North Lincolnshire Planning Portal \(northlincs.gov.uk\)](https://www.northlincs.gov.uk/planning/pa/2021/1525)

7. Key Ecological Interests: Baseline Conditions Update relating to SAC species and habitats

Estuarine Habitats

- 7.1. 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 Material Change 2 Updated ES.
- 7.2. 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: Material Change 2 Appendix UES10-4⁴).
- 7.3. 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.

Intertidal mudflats

- 7.4. 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.
- 7.5. 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 (Material Change 2 UES Appendices UES10-3 and UES10-4) recorded a broadly similar assemblage to that recorded in the baseline of 2010 for the original DCO ES.
- 7.6. The original DCO 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.
- 7.7. A broadly similar intertidal invertebrate assemblage was recorded in 2015 and 2016 at the AMEP site (Material Change 2 Appendices UES10-3⁵ and UES10-4), although with some restrictions in the extent of the typical intertidal mudflat community correlating to saltmarsh community colonisation.

⁴ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000162-TR030006-APP-6A-10-4.pdf>

⁵ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000161-TR030006-APP-6A-10-3.pdf>

- 7.8. 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 altered in response to the increase in elevation and associated saltmarsh development.
- 7.9. The 2016 subtidal survey (Allen, 2020: Material Change 2 Appendix UES10-4) reported the subtidal bed to feature a very impoverished faunal community typical for the middle Humber and in line with findings from previous surveys (as described in the original DCO ES and in the Material Change 2 Updated ES supporting documentation 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*.
- 7.10. Allen (2016) 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.
- 7.11. 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 deposit grounds, no significant change outwith these parameters is expected.

Saltmarsh: (1) *Salicornia* and other annuals colonising mud and sand, and (2) Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*)

- 7.12. At the time of the original DCO 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.
- 7.13. However, the potential for accretion of the intertidal mudflat and associated increase in elevation and potential colonisation by saltmarsh was identified in the Examining Authorities Report⁶ (2013).
- 7.14. A clear expansion in the extent of saltmarsh communities e.g. as surveyed in 2020 and 2021 (Material Change 2 Appendix UES10-1: Thomson Environmental Consultants, 2020. North Killingholme Marshes Saltmarsh Survey 2020⁷), has occurred on the intertidal frontage of the proposed AMEP development site since the baseline surveys for the original DCO application.

Grey Seal

- 7.15. 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 DCO application nor for the Material Change 2 or for this Time Extension. The occasional presence of grey seal in the vicinity of the AMEP development relates to the potential presence of prey items, and the populations of the species in the wider region e.g. Southern North Sea. The Humber Estuary SAC breeding grey seal colony at Donna Nook has shown a major increase since the original application, more than doubling in the last decade from around 2,000 individuals to recent counts of over 5,000 (Special Committee on Seals 2021⁸).

⁶ <https://infrastructure.planninginspectorate.gov.uk/document/TR030001-002249>

⁷ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000163-TR030006-APP-6A-10-1A.pdf>

⁸ <http://www.smru.st-andrews.ac.uk/scos/scos-data/august-seal-counts/august-seal-counts-england/>

- 7.16. As set out in the Material Change 2 UES Chapter 10⁹, there is the potential for any changes to the invertebrate and fish communities in the vicinity of the AMEP development to have an associated impact on grey seals through changes to prey composition and availability. However, the invertebrate and fish community composition remain the same as identified in the original ES and thus the nature of the effects will not change. No changes to the impacts on grey seals have been identified resulting from the material amendment to the proposed development.
- 7.17. The assessment of the effects of the material change on grey seals in the Material Change 2 UES Chapter 10 also acknowledges that the assessment guidance for marine mammals in relation to underwater noise and vibration has been supplemented by NOAA (2018¹⁰) but concludes that the proposed mitigation for grey seal would not need to be changed.

River Lamprey and Sea Lamprey

- 7.18. 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.
- 7.19. 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. There was no evidence of preferred use of these areas by migratory fish, confirming earlier observations. Only a single river lamprey was recorded, during the November-December 2013 subtidal otter trawling (from the control area north of the AMEP site; see Material Change 2 ES Table 10-10), and no sea lamprey.

⁹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000132-TR030006-APP-6-10.pdf>

¹⁰ National Oceanic and Atmospheric Administration, 2018. Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. NOAA Technical Memorandum NMFS-OPR-59, April 2018. National Oceanic and Atmospheric Administration National Marine Fisheries Service.

8. Ecological Integrity Test

8.1. As there has been deemed to be a likely significant effect on the SPA/Ramsar site (as was concluded for the Project in Part 1 of the HRA report), then the competent authority will be required to decide whether the plan or project would adversely affect the integrity of the site, in the light of the relevant conservation objectives. From UK Government guidance¹¹, “The integrity of the site will be adversely affected if a proposal could, for example:

- *destroy, damage or significantly change all or part of a designated habitat*
- *significantly disturb the population of a designated species, for example, its breeding birds or hibernating bats*
- *harm the site’s ecological connectivity with the wider landscape, for example, harm a woodland that helps to support the designated species from a nearby European site*
- *harm the site’s ecological function, or its ability to survive damage, and reduce its ability to support a designated species*
- *change the site’s physical environment, for example, by changing the chemical makeup of its soil, increasing the risk of pollution or changing the site’s hydrology*
- *restrict access to resources outside the site that are important to a designated species, for example, food sources or breeding grounds*
- *prevent or disrupt restoration work, or the potential for future restoration, if it undermines the site’s conservation objectives”*

8.2. The Conservation Objectives for the Humber Estuary SPA¹² 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 aims of the Wild Birds Directive, by maintaining or restoring;
 - The extent and distribution of the habitats of the qualifying features
 - The structure and function of the habitats of the qualifying features
 - The supporting processes on which the habitats of the qualifying features rely
 - The population of each of the qualifying features, and,
 - The distribution of the qualifying features within the site.

8.3. The conservation objectives for the Humber Estuary SAC 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,

¹¹ <https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site#test-the-integrity-of-the-site>

¹² Source: Natural England web site: <http://publications.naturalengland.org.uk/publication/5382184353398784>

- The distribution of qualifying species within the site.
- 8.4. Site-specific objectives were also considered in the assessment for all LSE species/communities, as set out in Natural England's Supplementary Advice on Conservation Objectives for the Humber Estuary SPA¹³ and for the Humber Estuary SAC¹⁴.

¹³ <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9006111&SiteName=humber&SiteNameDisplay=Humber+Estuary+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=15>

¹⁴ <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030170&SiteName=humber&SiteNameDisplay=Humber+Estuary+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=8,8>

9. Assessment of Effects on SPA, Ramsar and SAC Species and Communities

Construction Phase

- 9.1. As set out in the original ES and the Material Change 2 Updated ES Aquatic Ecology and Terrestrial Ecology and Nature Conservation chapters (Chapters 10¹⁵ and 11¹⁶ of both documents), the main potential effects of the construction of the Development on SPA/Ramsar ornithological features are considered to be:
- Direct loss of intertidal habitat within the Humber Estuary SPA/Ramsar through construction of project infrastructure;
 - Indirect Loss of intertidal habitat within the Humber Estuary SPA/Ramsar;
 - Loss of fish habitat within the Humber Estuary SPA/Ramsar that could affect bird foraging;
 - Loss of terrestrial habitat functionally linked to the Humber Estuary SPA/SAC;
 - Disturbance to birds and fish (noise and visual);
 - Underwater noise disturbance affecting fish;
 - Dredging and other construction effects on water quality;
 - Disposal of dredge spoil.
 - Cumulative effects.
- 9.2. The main potential effects of the construction of the Development on SAC/Ramsar ecological features are considered to be:
- Direct loss of intertidal habitat within the Humber Estuary SAC/Ramsar through construction of project infrastructure;
 - Indirect Loss of intertidal habitat within the Humber Estuary SAC/Ramsar;
 - Loss of fish habitat within the Humber Estuary SAC/Ramsar;
 - Disturbance to 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.
- 9.3. Each of these is considered in relation to the Integrity Test, in conjunction with the specific pressures identified by Natural England in their Advice on Operations relating to 'Construction of Port and Harbour Structures'. The following are given by NE as medium-high risk category:
- Above water noise
 - Abrasion/disturbance of the substrate on the surface of the seabed
 - Barrier to species movement
 - Changes in suspended solids (water clarity)

¹⁵ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000132-TR030006-APP-6-10.pdf>

¹⁶ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000133-TR030006-APP-6-11.pdf>

- 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.
- 9.4. Low risk pressures during construction included the following, though it should be noted that NE states for these that *“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.”* These have therefore been considered, but it was concluded that there are no factors at this site that would increase the risk above low, so they are not considered as possible risks to site integrity.
- 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.

Change in Construction Phase Effects from the proposed Time Extension

- 9.5. The proposed Time Extension would not result in any changes from the consented scheme affecting the Humber Estuary SPA, SAC and Ramsar site. The habitat loss resulting from the original DCO, the Material Change 2 and the Time Extension are summarised in Table 19 and relate to changes in habitat loss from the updated scheme. There would be no difference in the habitat loss from the Time Extension compared with the consented Material Change 2 scheme.

9.6. Table 19 shows the immediate (short-term) impacts of the scheme. Medium-term (30-year timescale) and long-term (100 year timescale) are explained in Material Change 2 UES Appendix 11-2¹⁷ but are deemed to be less significant due to the natural changes that would occur over decadal timescales to Killingholme Marshes foreshore without the scheme. In other words, its natural change from mudflat to saltmarsh and the impact of rising sea levels. The HRA is therefore based on the more critical short-term impacts.

Table 19. Habitat loss from the consented (original DCO and Material Change 2) and the proposed Time Extension.

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. MC2 quay redesign led to slightly reduced loss.
	1330	Saltmarsh	0	1.9	1.9	New loss of this community as 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)
	1330	Saltmarsh	0	4.7	4.7	New loss of this community as 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.

Note: further details of the change in habitat loss are given in Material Change 2 Appendix UES 11-2.

9.7. There would be no change in the extent of the habitat loss resulting from the proposed time extension. Losses would be the same as those for the consented Material Change 2.

¹⁷ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000174-TR030006-APP-6A-11-2.pdf>

- 9.8. There would be no change in the extent of the noise disturbance resulting from the proposed time extension. No new operations are proposed as part of the Time Extension and consequently there would be no additional noise disturbance.
- 9.9. There would be no change to the planned lighting regime for the proposed Time Extension. Lighting levels remain subject to approval under Schedule 11 of the extant DCO, Requirement 24 and require consultation with Natural England before being approved by the local planning authority.
- 9.10. The dredging proposals for the proposed Time Extension would remain the same as those consented for the Material Change 2.
- 9.11. Chapter 8 of the Material Change 2 UES¹⁸ proposed (at 8.5.2) alternate and additional mitigation, which has been considered in terms of the implications on the Humber Estuary designated features. This includes:
- Placement by barge of material dredged by CSD into sites HU081 and HU082 to spread impact during the placement period.
 - Consideration of placing greater quantity of material being placed into HU082 than HU081 to reduce potential for increased tidal currents around HU081.
 - Target placement of any glacial till dredged by BHD to HU082, so that changes caused by placement at HU081 occur for a shorter period.
 - Programme of bathymetric survey over HU081 and HU082 and in their vicinity during and after placement.
 - Use ongoing LiDAR monitoring as a source for surveillance of foreshore around Hawkins Point.
 - Current measurements pre- and post- construction of AMEP at the South Killingholme Oil Jetty to establish the significance of any changes to ebb tidal currents after construction of AMEP.
- 9.12. All of these measures will be implemented as part of the Time Extension and will ensure that there will be no adverse effect on site integrity relating to dredging.
- 9.13. Chapter 10 of the Material Change 2 UES found no significant changes have been identified compared to those described in the DCO (2014) and the Examining Authority's Report (2013). That remains the case for the proposed Time Extension. No significant effects were identified other than those assessed in the original DCO ES, and it was concluded that the mitigation measures provided in Chapter 10 Aquatic Ecology of the original DCO ES are considered to remain valid, with no significant residual impacts to the aquatic ecology of the Humber Estuary expected following their discharge.

Operational Phase

- 9.14. The main potential effects of the operation of the Development on birds would be:
- Disturbance to birds (noise and visual, including lighting);
 - Maintenance dredging, including boat disturbance;
 - Lighting impacts; and
 - Cumulative effects.

¹⁸ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030006/TR030006-000130-TR030006-APP-6-8.pdf>

- 9.15. The only operational phase pressure identified by NE in the medium-high risk category is the introduction of light, so specific consideration of this has been made in this assessment.
- 9.16. Low risk pressures identified by NE relating to 'Operation of Ports and Harbours' comprise the following, though as for the low risk construction phase pressures, there are not any factors at this site that would increase the risk above low, so they are not considered as possible risks to site integrity.
- 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

Change in Operational Phase Effects from the proposed Time Extension

- 9.17. The proposed Time Extension will not change the operational phase effects of the Development. The recent colonisation of the mudflat by saltmarsh has resulted in changes to the indirect functional loss of habitat through disturbance that will occur during the operational phase, with a reduced loss of mudflat and increased loss of saltmarsh compared with the original DCO.
- 9.18. There would be no change in the extent of the operational noise disturbance resulting from the proposed time extension. Operational noise levels are much less than construction noise levels and are not critical to the impact assessment. No new operations are proposed as part of the Time Extension and consequently there would be no additional noise disturbance. There would be no change either to the consented Material Change 2 lighting regime. Lighting levels are subject to approval under Schedule 11 of the extant DCO, Requirement 24 and require consultation with Natural England before being approved by the local planning authority.
- 9.19. There will be indirect functional habitat loss through disturbance during the operational phase of the development, likely displacing internationally important populations of regularly occurring Annex I species, migratory species and the waterfowl assemblage, due to the effective reduction in extent and distribution of the habitat supporting birds. As a result, **adverse effect on integrity** has been concluded for this functional loss.
- 9.20. The Project (including the proposed Time Extension) would not, subject to the mitigation secured by the DCO, have any other operational phase effects on any SPA or SAC

species/community, so would, following the implementation of the agreed mitigation measures, result in **no adverse effect on integrity**, with regard to any other operational phase impacts.

Assessment Update

- 9.21. The shadow Appropriate Assessment for the Humber Estuary SAC is summarised in Table 20, comparing the outcome of the DCO and Material Change 2 Appropriate Assessments with the assessment for the proposed Time Extension.
- 9.22. **Adverse effect on integrity** was concluded for loss of sub-tidal estuarine habitat, loss of intertidal mudflat and loss of saltmarsh.
- 9.23. **No adverse effect on integrity** was found for disturbance to grey seals and river and sea lampreys.
- 9.24. The shadow Appropriate Assessment for the Humber Estuary SPA is summarised in Table 21, comparing the outcome of the DCO and Material Change 2 Appropriate Assessments with the assessment for the updated Project incorporating the proposed time extension.
- 9.25. **Adverse effect on integrity** was concluded for all eight qualifying species of the Humber Estuary Special Protected Area (SPA) and Ramsar site (avocet, marsh harrier, bar-tailed godwit, black-tailed godwit, dunlin, knot, redshank and shelduck) and for the six wintering waterbird assemblage species (curlew, lapwing, mallard, ringed plover, shoveler and teal) for which LSE was identified, though direct loss of estuarine habitat (including intertidal mud, saltmarsh and sub-tidal), and through indirect functional loss as a result of disturbance. It could also not be ruled out that the continued use of NKHP as a roost site by waders from KMFS, particularly black-tailed godwit, could be affected once mudflats at KMFS were lost.
- 9.26. **No adverse effect on integrity** was found for (1) loss of terrestrial habitat (due to the provision of replacement foraging and roosting habitat in Halton Marshes Wet Grassland Mitigation Area), for (2) disturbance within NKHP (as a result of the protection from disturbance as set out in the extant DCO at Schedule 11 Requirement 42), for (3) lighting effects on NKHP (through implementation of the agreed lighting mitigation), and (4) from piling (based on the adoption of agreed measures for managing piling activities, are set out in Schedule 8 paragraphs 37-43 of the extant DCO).

Table 20. Shadow Appropriate Assessment for the Humber Estuary SAC/Ramsar: ES/SoCG and update in light of the proposed Extension of Time

Issue	Assessment (ES, SoCG)	Impact of Material Change 2 and Updated Baseline	Assessment update (after material change 2)	Impact of Time Extension and further Updated Baseline
Effects on estuarine habitat (H1130)	<p>Permanent direct losses of 45 ha (31.5 ha of intertidal mudflat and 13.5 ha of sub-tidal habitat) and medium and longer term changes to habitat arising from the quay presence (see <i>ES Annex B</i>).</p> <p>The effects result in an adverse effect due to a reduction in the extent and distribution of habitat for which no mitigation is possible. The effects of capital and maintenance dredging and disposal on sub-tidal habitat and benthic communities - no adverse effect on integrity .</p> <p>The effects on the wider estuary have been assessed (Deltares, 2012). EA has indicated that an allowance should be made for the change of 5 ha of intertidal habitat to sub-tidal. AHPL's has therefore, taken a precautionary approach and accepted this view and included 10 ha of intertidal mudflat in the habitat provided as compensation taking account of the 2:1 ratio for compensatory mudflat (see <i>ES Table 5.1 and Annex B</i>).</p> <p>Migratory movements of lamprey will not be affected by the presence of the new quay as described in <i>Annex 10.2</i> of the ES</p>	<p>Quay re-design has reduced direct loss of estuarine habitat.</p> <p>Additionally, habitat change resulting primarily from effects of the Humber International Terminal (HIT) since the original ES (accretion of saltmarsh) has meant that the habitats affected will include more saltmarsh and less intertidal mudflat</p>	<p>Permanent direct loss amended to 43.6 ha (31.3 ha of intertidal mudflat and 10.4 ha of sub-tidal habitat, plus an additional loss of 1.9ha of colonising saltmarsh), but no change to conclusions reached, i.e. adverse effect on integrity.</p> <p>No adverse effect on integrity from capital and maintenance dredging – no material change in vessel movements.</p>	<p>No change from consented Material Change 2. Adverse effect on integrity from habitat loss.</p> <p>No adverse effect on integrity from capital and maintenance dredging (no change from Material Change 2).</p>
Effects on intertidal mudflat and mudflat with pioneer	<p>Adverse effect concluded because of permanent direct loss for the new quay (31.5 ha), and in the longer term the indirect effects of the quay will result in the transformation of</p>	<p>Quay re-design has reduced direct loss of intertidal habitat.</p> <p>Additionally, some of the loss that</p>	<p>Permanent loss of intertidal mudflat reduced to 31.3ha, but conclusions unchanged, i.e. adverse effect on integrity.</p>	<p>No change from consented Material Change 2. Adverse effect on integrity</p>

Issue	Assessment (ES, SoCG)	Impact of Material Change 2 and Updated Baseline	Assessment update (after material change 2)	Impact of Time Extension and further Updated Baseline
saltmarsh (H1140/1310)	intertidal mudflat to saltmarsh (<i>ES Annex B</i>). These effects result in a reduction in the extent and distribution of intertidal mudflat, for which no mitigation is possible. The effects on intertidal mudflat as part of the effects on the wider estuary are as described above.	was intertidal mudflat previously has now been colonised by saltmarsh, so intertidal mudflat loss is reduced further.		
Effects on saltmarsh (H1330)	Adverse effect concluded as a reduction in the extent of saltmarsh (2 ha) occurs for which no mitigation is possible.	Loss of saltmarsh increased as a result of recent colonisation of the direct habitat loss area for the quay.	Additional direct loss of 1.9ha of saltmarsh (as result of colonisation of mudflat), but no change to conclusion, i.e. adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity
Disturbance to grey seals and river and sea lampreys (S1364, S1095 and S1099)	No adverse effect concluded with the implementation of the mitigation measures listed in <i>ES Section 4.4</i> .	Change to quay design.	No change to previous conclusion of no adverse effect on integrity.	No change from consented Material Change 2. No adverse effect on integrity

Table 21. Shadow Appropriate Assessment for the Humber Estuary SPA/Ramsar: ES/SoCG and update in light of the proposed Extension of Time

Issue	Assessment (ES, SoCG)	Relevant material change 2	Assessment update (material change) 2	Impact of Time Extension and further Updated Baseline
Effects on estuarine habitat (H1130)	Adverse effect concluded on internationally important populations of regularly occurring <i>Annex I</i> species, migratory species and the waterfowl assemblage, due to the reduction in extent and distribution of the habitat supporting birds. No mitigation is possible	Quay re-design has reduced direct loss of estuarine habitat. Additionally, habitat change resulting primarily from effects of the Humber International Terminal (HIT) since the original ES (accretion of saltmarsh) has	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity

Issue	Assessment (ES, SoCG)	Relevant material change 2	Assessment update (material change) 2	Impact of Time Extension and further Updated Baseline
		meant that the habitats affected will include more saltmarsh and less intertidal mudflat		
Effects on intertidal mudflat and mudflar with pioneer saltmarsh (H1140/1310)	Adverse effect concluded on internationally important populations of regularly occurring <i>Annex I</i> species, migratory species and the waterfowl assemblage, due to the reduction in extent and distribution of the habitat supporting birds. No mitigation is possible	Quay re-design has reduced direct loss of intertidal habitat. Additionally, some of the take area that was intertidal previously has now been colonised by saltmarsh, so intertidal loss reduced further.	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity
	Cannot confirm the continued use of NKHP as a roost site by waders from KMFS, particularly black-tailed godwit, once mudflats at KMFS lost. The effect cannot be mitigated. Therefore, as scientific doubt remains as to the absence of adverse effects, the competent authority cannot be certain that the scheme will not adversely affect the integrity of the European site.	No change - no construction proposed any closer to the NKHP than DCO	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity
Loss of terrestrial habitat	No adverse effect due to the provision of replacement foraging and roosting habitat in Mitigation Area A.	No change. Halton Marshes Wet Grassland Mitigation Area has been implemented as a substitute for Mitigation Area A	No change in conclusion - no adverse effect on integrity.	No change from consented Material Change 2. No adverse effect on integrity
Disturbance effects on birds	Indirect functional habitat loss through disturbance to internationally important populations of regularly occurring <i>Annex I</i> species, migratory species and the waterfowl assemblage, due to the effective reduction in extent and distribution of the habitat supporting birds. No mitigation is possible.	Some of the mudflat that was intertidal previously has now been colonised by saltmarsh, so intertidal loss reduced.	No change in conclusion - adverse effect on integrity.	No change from consented Material Change 2. Adverse effect on integrity
	No adverse effect on birds within NKHP based on a commitment to limit noise at site boundary.	No change.	No change in conclusion - no adverse effect on integrity	No change from consented Material Change 2. No adverse effect on

Issue	Assessment (ES, SoCG)	Relevant material change 2	Assessment update (material change) 2	Impact of Time Extension and further Updated Baseline
				integrity
	No adverse effects on birds using Mitigation Area A based on commitments to noise limits and to distance limits and storage heights within the operational buffer.	No change. Halton Marshes Wet Grassland Mitigation Area has been implemented as a substitute for Mitigation Area A	No change in conclusion - no adverse effect on integrity	No change from consented Material Change 2. No adverse effect on integrity
	No adverse effects on birds at NKHP from lighting within the AMEP site as described in <i>Supplementary Information EX19.1 - Lighting Lux Plans</i> .	No change.	No change in conclusion - no adverse effect on integrity	No change from consented Material Change 2. No adverse effect on integrity
	No adverse effects from piling based on adoption of measures agreed in the piling methods statement, which are set out in Schedule 8 of the DCO	No change.	No change in conclusion - no adverse effect on integrity	No change from consented Material Change 2. No adverse effect on integrity

10. Mitigation for the Project Alone

- 10.1. The mitigation measures identified as part of the extant DCO remain suitable and fit for purpose without requirement for modification. These include:
- provisions under Schedule 8 of the DCO to ensure functional aspects of the Humber Estuary SAC are maintained, including constraints on aspects of works timing to avoid/reduce impacts from underwater noise and vibration from piling work, provision of a Marine Mammal Observer to ensure no impacts to marine mammals (including Grey Seals) present in the vicinity of the construction works, and reduce noise and lighting impacts to birds.
 - provisions to provide greenfield terrestrial foraging and roosting habitat for birds from the SPA assemblage (predominantly curlew), to replace that lost to AMEP and to reduce noise and lighting impacts to birds.
- 10.2. Further details on the agreed mitigation measures pertaining to the development are provided in the original Terrestrial Ecology and Nature Conservation ES chapter¹⁹ and the original DCO (Appendix UES1-1). Measures will be secured through the approval of various plans and method statements as specified in Schedule 8 and 11 of the extant DCO.
- 10.3. These requirements have been reviewed in light of the proposed time extension and the updated baseline, and it has been concluded that they all would still be required for the material change, but that none would need any modification.
- 10.4. It is noted that a separate application for a non-material change to the DCO to move the location of Mitigation A to Halton Marshes has been approved, though the outcome of the Appropriate Assessment is still the same.

¹⁹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000315-11%20-%20Ecology%20and%20Nature%20Conservation.pdf>

11. In-combination Assessment

- 11.1. 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.
- 11.2. Consideration has also been given to the possible inter-related effects of construction and operation on the Project site at the same time (as parts may become operational at the same time as construction continues in other parts). However, the greater magnitude effects of the construction phase would mean that the operational phase impacts would not materially increase those, even if they were occurring simultaneously within the site.
- 11.3. In the HRA prepared by the Secretary of State for Material Change 2, it is recorded that:
- ‘AEol from the Proposed Changes in-combination with other plans or projects In combination effects only occur if there are residual effects of a project because impacts of the project have not been fully mitigated (or compensated) which could then cause a significant impact when taken together with another project that has not fully mitigated its impacts. As with the AMEP DCO, all impacts from the project alone are either fully mitigated or compensated for. The Secretary of State notes that in response to the RIES, NE [REP6-007] confirmed that it was satisfied that in combination effects have been satisfactorily addressed’, (Section 5.3).*
- 11.4. The compensation and mitigation proposals that have been agreed with Natural England for the Project continue to fully avoid any residual effects, therefore in-combination effects with other projects can be discounted.

12. Summary and Conclusion

- 12.1. This report has provided baseline data and analysis to inform the assessment process should the Competent Authority determine that an Appropriate Assessment is required (as was concluded in the Likely Significant Effects report).
- 12.2. The SPA and SAC Conservation Objectives (as set out in Section 6 above) against which this assessment needs to be made seek to maintain the habitats of the qualifying species in favourable condition.
- 12.3. The predicted effects of the Project Time Extension on the relevant SPA and SAC qualifying habitat and assemblage species in the context of the Habitats Regulations have been assessed above. These have been assessed against the SPA and SAC Conservation Objectives, to determine whether there would be any adverse effect of the development on the ecological integrity of the Humber Estuary SPA/SAC/Ramsar site.
- 12.4. The same conclusion was reached for the Time Extension as for the original DCO application and the Material Change 2, i.e. that the AMEP Project would have an **adverse effect on the ecological integrity of the SPA and of the SAC**, through direct loss of habitat and through indirect functional loss as a result of disturbance. The residual effects of the DCO Time Extension alone, taking account of the mitigation, will have an adverse effect on the integrity of the Humber Estuary SAC, SPA and Ramsar site due to the reduction in the extent and distribution of qualifying interest habitats (estuarine habitats, intertidal mudflat and saltmarsh), and a deterioration in the quality of these habitats for qualifying bird species. In addition, there will be significant disturbance to these bird species, and their populations and distribution will be affected.
- 12.5. In summarising the likely effects on the qualifying populations/communities for the SPA/SAC/Ramsar site, the assessment process illustrated in the flow diagram in the Planning Inspectorate's Advice Note 10 (reproduced in Figure 1 of Part 1 of the HRA report) is undertaken as follows:
- *"Is the project likely to have significant effect on the site?"*
 - For eight qualifying species, and six assemblage species of the Humber Estuary SPA/Ramsar, and for six features of the Humber Estuary SAC/Ramsar, this cannot, under the definition of likely significant effect under the Habitats Regulations, be ruled out, so the next stage is:
 - *"Assess the implications of the effects of the proposal for the site's conservation objectives"*
 - *"Will the project affect integrity of the site?"*
 - Yes. Qualifying and assemblage species have been identified as being significantly affected by the Project. In terms of the relevant tests under the Habitat Regulations, it has been concluded that the proposed development would threaten the ecological integrity of the Humber Estuary SPA/SAC/Ramsar site.
- 12.6. The DCO Time Extension impacts that could have an adverse effect on integrity of the Humber Estuary SAC/Ramsar (and hence requiring compensation) are the same as those for the original DCO scheme and the Material Change 2, and are as follows:
- Permanent direct loss of 43.6 ha estuarine habitats (31.3 ha of intertidal mudflat and 10.4 ha of sub-tidal habitat, plus an additional loss of 1.9ha of colonising saltmarsh).
- 12.7. The DCO Time Extension impacts that could have an adverse effect on integrity of the Humber Estuary SPA/Ramsar (and hence requiring compensation) are also the same as those for the original DCO scheme and the Material Change 2, and are as follows:
- Adverse effect on internationally important populations of regularly occurring Annex I species, migratory species and the waterfowl assemblage, due to the reduction in extent and distribution of the habitat supporting birds.

- The continued use of NKHP as a roost site by waders from KMFS cannot be confirmed, particularly black-tailed godwit, once the mudflats at KMFS are lost.
 - Indirect functional habitat loss through disturbance to internationally important populations of regularly occurring Annex I species, migratory species and the waterfowl assemblage, due to the effective reduction in extent and distribution of the habitat supporting birds.
- 12.8. A compensation scheme was agreed for the original DCO, as set out in the AMEP Compensation Environmental Management and Monitoring Plan (agreed in January 2016). That scheme was agreed to be appropriate for the Material Change 2. The magnitude of the impacts of the consented Material Change 2 scheme was slightly reduced on the original DCO scheme after, but the compensation scheme remained unchanged. As the proposed Time Extension would have the same impacts as the Material Change 2, that compensation scheme can be expected to still provide the appropriate quantum of compensation. Further details of the losses and compensation ratios for the habitat that will be lost are reviewed in the Material Change 2 Technical Appendix UES11-2.