ABLE MARINE ENERGY PARK (MATERIAL CHANGE 2 – TR030006)

UPDATED ENVIRONMENTAL STATEMENT

CHAPTER 18: MARINE ARCHAEOLOGY

Able Marine Energy Park, Killingholme, North Lincolnshire

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CONTENTS

DOCUMENT REFERENCES

TABLES

FIGURES

APPENDICES

Appendix UES18-1: Written Scheme of Investigation: Coastal and Marine, Wessex Archaeology, 2012

Appendix UES18-2: Figure 18-1: Site location and marine heritage receptors

Appendix UES18-3: Wessex Archaeology 2011 Abel Marine Energy Park (AMEP), Humber Estuary: Geoarchaeological Recording and Sub-sampling. Unpublished report. Ref: 76490

Appendix UES18-4: Wessex Archaeology 2012b Able Marine Energy Park (AMEP), Humber Estuary, Stage 2/3 Geoarchaeological Recording and Sub-sampling. Unpublished report. Ref: 76491.01

18.1.0 Introduction

Development Consent Order Context

18.1.1 The development consent order (DCO) for the site approved a harbour development with associated land development to serve the renewable energy sector. The harbour comprises a quay of 1,279 m frontage, of which 1,200 m is solid quay and 79 m is a specialist berth formed by the reclamation of intertidal and subtidal land within the Humber Estuary.

18.1.2 The associated development for the above proposals includes:

- Dredging and land reclamation;
- The provision of onshore facilities for the manufacture, assembly and storage of wind turbines and related items;
- Works to Rosper Road, the A160 and the A180; and
- Surface water disposal arrangements.

18.1.3 The impacts of the development on the Historic Environment were considered in Chapters 18[1] and 40[2] of the original Environmental Statement (original ES) to the DCO. A marine archaeological Written Scheme of Investigation (WSI) was produced in 2012 in order to set out the mitigation agreed to limit the development's impacts on the marine Historic Environment (Appendix UES18-1). This WSI was based on a review of geoarchaeological data (Wessex Archaeology 2011 & 2012b; Technical Appendices UES18-3 and UES18-4) and geophysical survey data captured by Emu Limited in 2010 (Emu 2010)[3].

18.1.4 Schedule 11 Requirement 17 of the DCO (Appendix UES1-1) required that:

- (1) No stage of the authorised development is to commence until, for that stage, a written project design for the investigation of areas of archaeological interest as identified in chapters 18 and 40 of the environmental statement has been submitted to and approved by the relevant planning authority.
- (2) The project design must accord with the evaluation results and mitigation measures included in the document *Able UK Ltd Marine Energy Park: Framework for archaeological investigation and mitigation strategies* prepared by AC Archaeology Ltd (ref: ACW283/3/1 revised June 2012)[4], and the *Written Scheme of Investigation: Coastal and Marine* prepared

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000323-18%20-%20Historic%20Environment.pdf

[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000345-40%20-%20Historic%20Environment.pdf

[3] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-000365-7.1%20-%20Geoenvironmental%20Assessment.pdf

[4] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030001/TR030001-001598-SOCG005%20TR030001%20Able%20Humber%20Ports%20Ltd%20Statement%20of%20Common%20Ground%20with%20English%20Heritage.pdf

by Wessex Archaeology (ref 79490.02 revised March 2012) and subsequent updates, to be agreed by the relevant planning authority.

- (3) The project design must identify—
  - (a) areas where fieldwork is required;
  - (b) measures to be taken to identify, protect, record and recover any archaeological remains that may be found including artefacts and ecofacts;
  - (c) methodologies for post-excavation assessment and analysis of artefacts and ecofacts;
  - (d) arrangements for dissemination and publication of reports;
  - (e) preparation of archive material and its deposition with recognised repositories;
  - (f) an implementation timetable;
  - (g) monitoring arrangements, including notification and commencement of work;
  - (h) details of contractors involved in the implementation of archaeological works; and
  - (i) proposals for publicity and community outreach work.
- (4) Any archaeological works carried out under the scheme must be carried out by a suitably qualified person or body.
- (5) Any archaeological works must be carried out in accordance with the approved scheme and timings, subject to any variation approved by the relevant planning authority.

18.1.5 No change to the Written Scheme of Investigation is proposed as part of the material change application.

Consideration of Material Amendments

18.1.6 The proposed changes to the development are described in Chapter 4 (Description of Changes to Development) of this Updated Environmental Statement (UES). The only elements of the material amendment of relevance to the Historic Environment are those associated to the proposed quay layout and the revised dredging arrangements.

18.1.7 The proposals will reclaim the specialist berth at the southern end of the quay, and set back the quay line at the northern end of the quay to create a barge berth. However, the overall footprint of the quay is largely unchanged so there will not be more extensive physical impacts and significant adverse effects on the marine environment than were consented to in the original DCO.

18.1.8 In addition, the dredging permissions are proposed to be changed to the extent necessary to dredge the berthing pockets and approaches for the amended quay line. As there is no alteration to the depths of the dredging (-11 m CD in the berthing pocket, -9 m CD in the approach channel and turning area), this does not induce additional effects on the marine Historic Environment.

Purpose and Structure of Chapter

18.1.9 This chapter of the UES considers the impact of the proposed material change on the Historic Environment. Given the scope of the proposed material change, the content of this chapter is limited to the consideration of the marine Historic Environment and there is no need to consider terrestrial Historic Environment beyond that contained within the original ES for the DCO.

18.1.10 This chapter includes consideration of:

- changes in legislation, policy and guidance relating to marine Historic Environment since the DCO application;
- physical changes in the baseline context at the site as relevant to marine Historic Environment and the proposed material amendments;
- changes in the understanding of risk for both the current day situation and future scenarios; and
- the material amendment to the proposed scheme and how these influence the marine Historic Environment.

18.2.0 Methodology

18.2.1 As part of the DCO application, and in support of the original ES, an archaeological impact assessment was undertaken for the AMEP. The impact assessment evaluated how the proposed development will affect the site and its surroundings as well as the terrestrial and marine Historic Environment.

18.2.2 Within the Historic Environment chapter of the original ES (Chapter 18) the impact of the proposed development on the marine Historic Environment was evaluated to determine the likelihood of the AMEP causing:

- impacts on paleo-land surfaces;
- impacts on maritime archaeology; and
- Impacts on aviation archaeology.

18.2.3 Adverse direct impacts and adverse secondary impacts were expected on these receptors from the construction of the new quay (original ES para. 18.6.6 to 18.6.9). No adverse indirect impacts on marine heritage assets through changes in the hydrology and sedimentation / erosion regimes were expected (original ES para. 18.6.10).

18.2.4 Adverse direct impacts and adverse secondary impacts were also expected from the dredging of the berthing pocket, approach channel and turning area (original ES para. 18.6.21 to 18.6.22). No adverse indirect impacts on marine heritage assets through changes in the hydrology and sedimentation/ erosion regimes were expected (original ES para. 18.6.23).

Changes in Legislation, Guidance and Planning Policy

Legislation

18.2.5 There have been no changes in legislation relevant to the marine historic environment since the original ES for the DCO.

Commercial Renewable Energy Development and the Historic Environment (Historic England 2021)

18.2.6 Historic England published its Advice Note 15 in 2021 relating to Commercial Renewable Energy Development and the Historic Environment. This describes the potential impacts on the historic environment of commercial renewable energy proposals, which could occupy large areas of land or sea.

Marine Policy Statement (HM Government 2011).

18.2.7 The Marine Policy Statement (MPS) was jointly published by all UK Administrations in March 2011 as part of a new system of marine planning being introduced across UK seas. The MPS sets out the framework for preparing Marine Plans and making decisions affecting the marine environment. The MPS also states that Marine Plans must ensure a sustainable marine environment that will protect heritage assets.

The National Planning Policy Framework

18.2.8 The previous assessments reference Planning Policy Statement 5 (2010). This was superseded in 2012, and again updated in 2019, by the National Planning Policy Framework (NPPF) and the associated Planning Practice Guide (PPG) for the Historic Environment, published in 2014 and updated in 2019. The NPPF and associated PPG now provide the framework for assessing the impact of certain developments on heritage assets.

North Lincolnshire Planning Policy

18.2.9 There have been no material changes to local planning policy in relation to the marine historic environment since the application.

Scoping Opinion

18.2.10 Table 18-1 outlines issues relating to marine archaeology which were included within the Scoping Opinion adopted by the Planning Inspectorate (PINS).

Table 18-1: Scoping Opinion

Page & Paragraph No.	Scoping Opinion	Comments	Outcome	Reference within UES
Table 7	4.12.1	The Scoping Report proposes to scope out any updated assessment of impacts to historic environment features as a result of the proposed change. The Inspectorate does not agree to this approach and considers that updated assessment should be undertaken to assess impacts that occur from the altered quay alignment. The updated assessment should be informed by the updated assessment of impacts to the hydrodynamic and sedimentary regime, particularly where impacts from erosion or accretion of sediment may have changed from the original assessment.	This Chapter updates the assessment in light of the altered quay alignment. The hydrodynamic modelling is reported in Chapter 8 and there is no significant change in impacts and therefore no additional impacts on the marine historic environment other than those assessed in the original ES.	Section 18.4.0
Table 7	4.12.2	The Scoping Report suggests that the existing requirement for the Marine WSI will be sufficient to address any necessary changes to mitigate differing impact characteristics as a result of the proposed changes. The Applicant should make effort to agree this position with relevant consultation	It has been agreed with North Lincolnshire Council and Historic England that the extant Marine WSI will be retained for the purposes of this application (Meeting held on 9 June 2021).	Appendix UES18-1

Page & Paragraph No.	Scoping Opinion	Comments	Outcome	Reference within UES
		bodies. If alterations to the WSI are required to support this position the details should be explained within the updated assessment.		
n/a	4.12.3	The Inspectorate notes the comments received by Historic England that relate to the greater knowledge gained from pre-construction WSI activities. The Inspectorate considers that the updated assessment should be informed by this information and used to assess the impacts on the coastal and marine historic environment.	There have been no pre-construction activities completed under the 2012 WSI, and therefore there is no new information from this source with which to form the basis of an updated assessment.	Baseline conditions are reviewed in Section 18.3.0

Additional Consultation

18.2.11 Responses to comments received from the statutory consultation on the Preliminary Environmental Information Report (PEIR) carried out between 15 April and 26 May 2021 are set out in Table 18-2 below.

Table 18-2: Responses to the PEIR Consultation

Reference	Comments	Outcome
North Lincolnshire Council	The amended Marine WSI included in the PEIR is inadequate.	The amended WSI is withdrawn from the application.
Historic England	The proposed changes to the Marine WSI included in the PEIR are unjustified.	The amended WSI is withdrawn from the application.

18.2.12 Following receipt of the comments on the preliminary environmental information, a meeting was held between Able UK Ltd, Wessex Archaeology, Historic England and North Lincolnshire Council on 9 June 2021. At the meeting it was agreed that no changes to the extant Marine WSI (Appendix UES18-1) would be sought through the material change process as changes can be addressed at any time through the change process provided for in Schedule 11, paragraph 17(2).

Assessment Methodology

18.2.13 The assessment methodology for the Historic Environment was defined within Chapter 18 of the original ES for the DCO[1]. However, the sections below detail changes to this methodology in light of more recently adopted policy.

18.2.14 Data from the United Kingdom Hydrographic Office Wreck Database and North Lincolnshire HER were acquired in September 2020 and reassessed. No new heritage receptors were found within the area relevant to the material amendments to the DCO.

Study Area

18.2.15 The site lies between the C.Ro Port Killingholme and ABP Immingham Port centred on National Grid Reference (NGR) TA 16145 19906. The marine areas under study originally covered approximately 31.5 ha of existing intertidal area and 13.5 ha of existing subtidal area, but both areas would be slightly reduced pursuant to the material change. A wider area is to be dredged to provide suitable access for marine traffic. These areas are located within the Humber Estuary and extend from the existing tidal defences towards the deep-water channel that serves the C.Ro Port Killingholme. Indirect impacts from the hydrodynamic and sedimentary regime on the marine historic environment could cover an area greater than this, but the original ES concluded that these would have no adverse indirect impacts on the marine historic environment (original ES Paras. 18.6.10, 16.6.23), meaning relevant impacts are limited to within the site boundary.

18.2.16 The study area has not been expanded from the study area utilised within the original ES for the DCO (original ES Section 4.3).

Sensitivity Criteria

18.2.17 The sensitivity criteria utilised have been updated in light of more recent policy relating to the Historic Environment. The sensitivity criteria utilised in undertaking this Chapter of the UES is outlined below.

18.2.18 The capability of a receptor to accommodate change and its ability to recover if affected is a function of its sensitivity. Receptor sensitivity is typically assessed via the following factors:

- **Adaptability** – the degree to which a receptor can avoid or adapt to an effect;
- **Tolerance** – the ability of a receptor to accommodate temporary or permanent change without significant adverse impact;
- **Recoverability** – the temporal scale over and extent to which a receptor will recover following an effect; and
- **Value** – a measure of the receptor's importance, rarity and worth.

18.2.19 Since archaeological receptors cannot adapt, tolerate or recover from physical impacts caused by a proposed development for the purpose of this assessment, the sensitivity of each asset will be quantified only by its value. The UK Marine Policy Statement (HM Government, 2011) describes a heritage asset as holding a degree of significance. Significance is the value of a heritage asset to this and future generations because of its heritage interest, which may be archaeological, architectural, artistic or historic.

18.2.20 The value of known archaeological and cultural heritage assets is assessed on a five point scale using professional judgement informed by the criteria provided in Table 18-3 below.

Table 18-3 Sensitivity Criteria

Sensitivity	Definition
National (High)	• Best known, only example, or above average example and/ or high potential to contribute to knowledge and understanding and/ or outreach. • Receptors with a demonstrable national or international dimension to their importance are likely to fall within this category. • Wrecked ships and aircraft that are protected under the Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979 or Protection of Military Remains Act 1986 with an international dimension to their importance, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value. • Known submerged prehistoric sites and landscapes with the confirmed presence of largely in situ artefactual material. Palaeogeographic features with demonstrable potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.
County / Regional (Medium)	• Average example and/ or moderate potential to contribute to knowledge and understanding and/ or outreach. • Receptors with a demonstrable regional dimension to their importance are likely to fall within this category. • Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation. • Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
Local (Low)	• Below average example and/ or low potential to contribute to knowledge and understanding and/ or outreach. • Receptors with a demonstrable local dimension to their importance are likely to fall within this category. • Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have low potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation. • Prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment.
Not Significant	• Poor example and/ or little or no potential to contribute to knowledge and understanding and/ or outreach. Assets with little or no surviving archaeological interest.
Unknown	• There is not presently enough information available about the site to assess its value.

Magnitude of Change (Impact)

18.2.21 The magnitude of effect and its significance was defined in Table 18.5 of the original ES for the DCO, reproduced below for ease of reference (Table 18-4). The same approach is adopted in this UES.

Table 18-4 Assessment of overall magnitude of impact

Magnitude of Change	Sensitivity of Receptor			
	National Significance	County/Regional Significance	Local Significance	Not Significant
High	Major Significance	Moderate Significance	Moderate to Minor Significance	Minor Significance
Medium	Moderate Significance	Minor to Moderate Significance	Minor Significance	Minor to No Significance
Low	Minor Significance	Minor Significance	Minor to No Significance	No Significance
None	No Significance	No Significance	No Significance	No Significance

Mitigation Hierarchy

18.2.22 While not defined within the ES for the original DCO application, a hierarchy was employed for mitigation within the 2012 WSI. Where possible this seeks to avoid adverse effects and only where this is not possible are remedial options for reducing, remedying or compensating for any identified effects considered.

Effects Not Requiring Further Assessment

18.2.23 The effects not requiring further assessment that were assessed in the original ES are those relating to the:

- Terrestrial Historic Environment from;
  - Topsoil stripping, earthmoving and infilling;
  - Infilling site to new levels;
  - Use of large construction plant, cranes etc;
  - Lowering of water levels;
- Marine Historic Environment due to the new quay construction, including;
  - Installation of tubular piles and sheet piles for new quay and piling to support relieving slab and jetty;
  - Rainbowing and hydraulic fill of reclamation area; installation of rock revetment;
  - Relocation of outfall and works associated with existing seawall;
- Marine Historic Environment within the berthing pocket, approach channel and turning area

due to;

- Construction of Reinforcement of berthing pocket; and

- Effects on setting of significant heritage assets.

18.2.24 This approach and the exclusion of the above elements of assessment were agreed through the undertaking of the formal scoping exercise with PINS.

18.3.0 Changes in Baseline Conditions

DCO Baseline

18.3.1 The baseline conditions were initially set out in the original ES (original ES Section 18.5). Within the broad study area, covering both the terrestrial and marine historic environment, there were 29 Scheduled Monuments, one Registered Park, 176 grade II Listed Buildings, 30 grade II* Listed Buildings, 27 Grade I Listed Buildings and two Conservation Areas within the 10 km radius (original ES Table 18.3). There were no shipwrecks designated under the *Protection of Wrecks Act* 1973, there were no shipwrecks or known aircraft remains protected under the *Protection of Military Remains Act* 1986.

18.3.2 All maritime archaeology receptors, including the recorded losses and charted wrecks (Sites 22-25, 109-115), foul ground (Sites 128, 129 and 130) and magnetometer anomalies (Sites 12, 27-30, 131-133, 167) were assessed to be of either local significance due to their archaeological, architectural, artistic or historic interest, i.e. they would score low using the non-statutory criteria for assessing scheduled monuments, or of no significance, i.e. they were not considered to be of archaeological, architectural, artistic or historic interest (original ES Table 18.4).

DCO Future Baseline

18.3.3 No future baseline for the marine or terrestrial historic environment was defined within the original ES.

Current Baseline

18.3.4 A review of the current baseline has been undertaken for the UES and is outlined in more detail below.

Overview

18.3.5 Within the area of the marine area of the development site there are ten possible archaeological receptors. A summary gazetteer can be seen in Table 18-4, whilst Figure 18-1 below provides a drawing extract of their locations. The full figure is included in Appendix UES18-2.

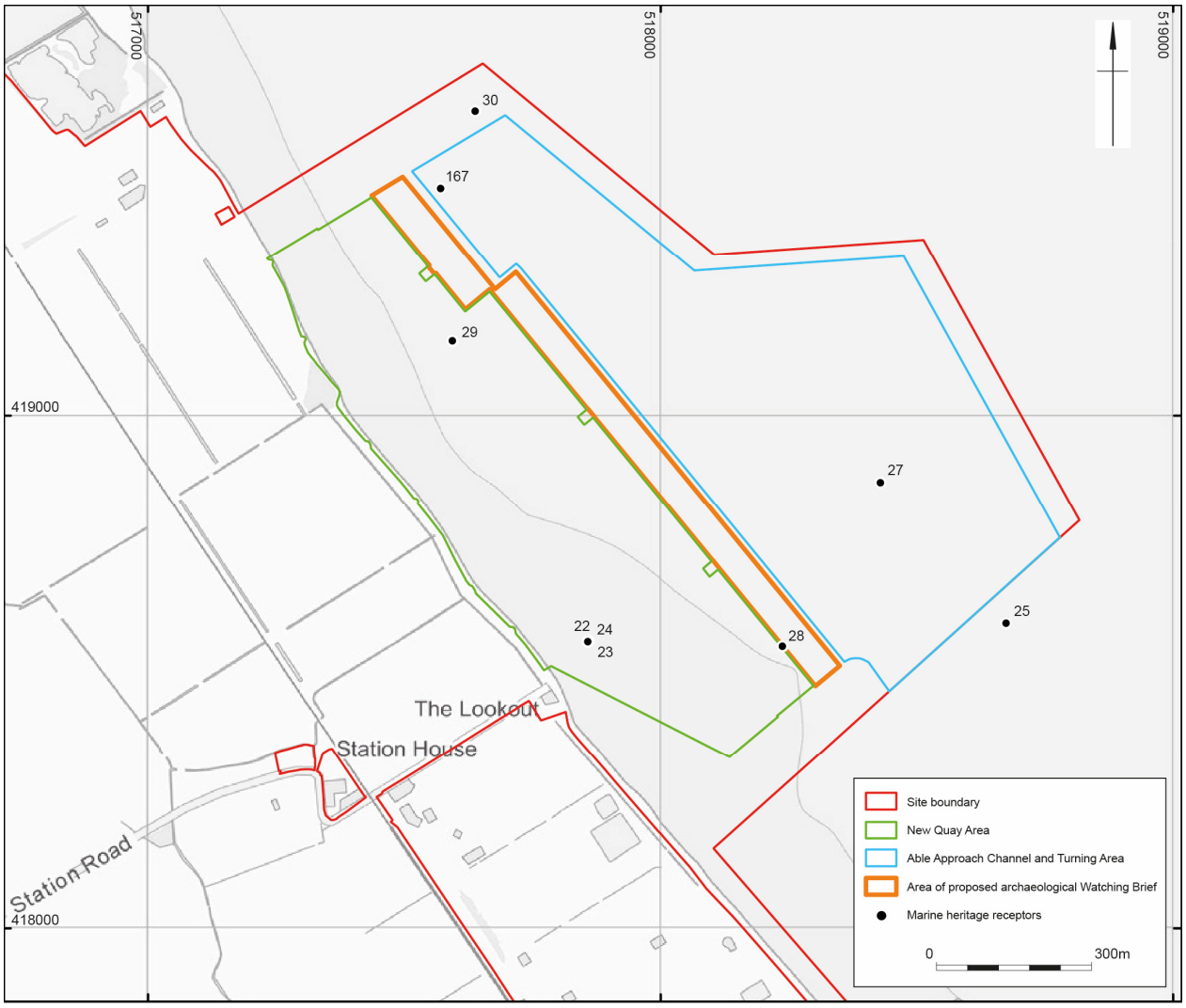
18.3.6 There are no shipwrecks designated under the *Protection of Wrecks Act* 1973.

18.3.7 There are no known aircraft remains within the proposed development, and therefore there are no aircraft remains protected under the *Protection of Military Remains Act* 1986. However, there is one reported loss of a Halifax MKIII MZ576 bomber to the south of the AMEP, the remains of which have not yet been located (site 122).

Table 18-4: AMEP Marine Gazetteer

Site No	HER/NMR Reference	Easting	Northing	Form/Type	Description
22	MLS 20123 NMR 943015	517860	418560	Recorded loss	IVY, English Ketch, built 1874, recorded wrecked 1897 whilst on a fishing trip. Owner: J Munby, Master: E J Barth, Crew: 5. Vessel foundered and was lost following a collision with the Goole registered SS Corea. Location unknown.
23	NMR 943096	517860	418560	Recorded loss	WILLIAM, English Sloop Built 1883 recorded wrecked 1899. Owner: W Marshall & Sons, Grimsby, Master: J Ball, Crew: 2. Vessel foundered and was lost following collision with the Hull registered steam trawler ORINOCO. Location unknown.
24	NMR 907861 UKHO 8510	517858	418559	Recorded loss	SERGEI, Hull built screw steamer built 1899 wrecked after a collision, whilst en route from Malmo to Hull with pit props in 1923. The ship was raised and broken up 1923, however dispersal operations still on-going through to October 1924. UKHO provides alternative position 518697, 418548, which lies 40m outside of the AMEP.
25	NMR 907862 UKHO 8511	518674	418595	Wreck	COOK S26, barge wrecked 11th February 1955. Salvage work undertaken in 1959, but still charted as a wreck on current charts. Remains of the barge have been confirmed as present on the seabed through geophysical survey.
27	-	518429	418869	Magnetometer anomaly	Apparent large single object, relative target size 8.83 (Emu 1).
28	-	518238	418550	Magnetometer anomaly	Apparently multiple objects, relative target size 9.47 (Emu 3).
29	-	517594	419145	Magnetometer anomaly	Strong singular signature, relative target size 12.58 (Emu 5). Possible wreck site.
30	-	517638	419593	Magnetometer anomaly	Strong singular signature, relative target size 11.55 (Emu 6). Possible wreck site.
122	NMR 1341163	520110	416760	Recorded loss	Handley Page Halifax Mk. III heavy bomber; one of a batch of 360 delivered between March and August 1944, Squadron 10. Two engines feathered; ditched off Immingham 28th October 1944. Location unknown
167	-	517571	419443	Magnetometer anomaly	Apparently multiple objects, could be unidentified wreckage. Target size 11.41 (Emu 7).

Figure 18-1: Site location and marine heritage receptors (extract)



The New Quay

18.3.8 There are two unidentified magnetometer anomalies (sites 28 and 29) within the quay area. There are also three recorded losses (sites 22, 23 and 24), these are documentary references to wrecking events that have been assigned an arbitrary location, and no wreckage has been confirmed at this location. Their remains are likely to lie elsewhere.

18.3.9 Vibrocores VC20 and VC21 within the area of the new quay contained organic material indicative of the presence of prehistoric land surfaces and deposits (Wessex Archaeology 2011; Technical Appendix UES18-3). In addition, recording and sub-sampling has been carried out on six core samples from three boreholes by Wessex Archaeology and the logs of 77 boreholes reviewed (Wessex Archaeology 2012b; Technical Appendix UES18-4). This indicated that Pleistocene and Holocene sediments including glacial, alluvial, peat and estuarine alluvial sediments of prehistoric archaeological and palaeoenvironmental interest exist in the area of the Deepwater Frontage of the AMEP at a depth which is to be dredged using backhoe dredging techniques.

18.3.10 In addition to the features that are known from coring and desk-based study there is potential for as yet unknown features and sites to be present in the area of the new quay. These sites range from

prehistoric land surfaces, and associated sites, to the remains of vessels, from the prehistoric to modern periods, and aircraft crash sites. The anchorage of Whitebooth Roads, off Killingholme, is believed to have been heavily used and a focus for shipping in this stretch of the river.

The Berthing Pocket, Approach Channel and Turning Area

18.3.11 There are two unidentified magnetometer anomalies (sites 27 and 167) in the dredging area, and a further magnetometer anomaly within the development boundary but outside the approach channel and turning area (site 30). Just outside the southern extent of the turning area and approach channel dredging pocket is a 20th century wreck which has an associated geophysical anomaly (site 25). This is the *Cook S26*, a barge wrecked in 1955. It is reported to have been lifted following its wrecking, and so the anomaly may relate to broken or lost parts of the wreck.

18.3.12 Vibrocores VC07, VC09 and VC13 within the dredging area, and adjacent VC05, VC06, and VC08, contained organic material indicative of the presence of prehistoric land surfaces and deposits (Wessex Archaeology 2012b; Technical Appendix UES18-4). However, the levels of these land surfaces are all below the maximum depth of dredging planned.

18.3.13 In addition to the features that are known from coring and desk-based study, there is potential for as yet unknown features and sites to be present in the dredging area, ranging from prehistoric land surfaces and associated sites to hitherto unknown wrecks of dating from the prehistoric to modern periods, to aviation remains. These sites, if present, could range from low to high sensitivity and, in the case of military aviation remains, be subject to automatic legal protection under the *Protection of Military Remains Act* 1986.

Future Baseline

18.3.14 As in the original ES, no future baseline needs to be considered as part of the assessment of Marine Archaeology.

Changes in Baseline

18.3.15 Paragraphs 18.3.3 to 18.3.15 of the original ES establish the current baseline considerations for the AMEP DCO. Upon review, it can be confirmed that there have been no changes in the baseline since the original ES.

18.4.0 Assessment of Effects

Additional Construction Phase Effects

18.4.1 Using the sensitivity criteria Table 18-3, the significance of potential marine heritage receptors has been reassessed and is set out in Table 18-5.

Table 18-5: Significance of potential receptors

Sensitivity of Receptor (if present)	Palaeo-land surfaces		Maritime Archaeology		Aviation Archaeology	
	In-situ Prehistoric sites	**High**	As yet unknown shipwrecks	**Minor to High**	As yet unknown aircraft wrecks (civil)	**Minor to High**
	Submerged landscape features (without associated archaeological material)	**Medium**	Features indicated by post alignments and former jetties	**Minor to High**	As yet unknown aircraft wrecks (military)	**High**
	Isolated Prehistoric finds	**Medium**	Isolated Maritime finds	**Medium**	Isolated Aviation finds	**Medium**
	Isolated examples of Palaeo-environmental evidence	**Minor**				
Overall significance	**Minor to High Significance**		**Minor to High Significance**		**Minor to High Significance**	

18.4.2 The original effects of dredging within the reclamation area and the berthing pocket on palaeo-land surfaces, maritime archaeology and aviation archaeology were considered of minor to moderate significance within the original ES (Tables 18.7 and 18.8).

18.4.3 The construction phase impacts altered by the change in quay design and dredging from the original ES are:

- Dredging operations in a realigned Berthing Pocket (original ES Section 18.6).

18.4.4 The area impacted by the construction of the consented Quay contains only recorded losses with no confirmed wreck material, and two low potential magnetometer anomalies (sites 28 and 29). The potential for geoarchaeological remains that may be impacted by the works is identified as low.

18.4.5 The potential for impacts on archaeological receptors within the berthing pocket dredge area has also been identified, in particular deposits of geoarchaeological interest (palaeo-land surfaces). Within this area, geoarchaeological deposits containing palaeoenvironmental evidence were identified within VC20 and VC21 of the geoarchaeological assessment (Wessex Archaeology 2012b; Technical Appendix UES18-3). Their significance was classed as Medium. Within the turning area and approach channel, the dredging works will either be removing deposits containing low/negligible potential for palaeoenvironmental evidence or will not be excavating to a level which would impact deposits with potential for palaeoenvironmental evidence. There are also two low potential magnetometer anomalies within the dredging area (sites 27 and 167).

18.4.6 The new proposals will reclaim the specialist berth at the southern end of the quay and set back the quay line at the northern end of the quay to create a barge berth. However, the overall footprint of the quay is largely unchanged, although the dredging permissions are proposed to be changed to the extent necessary to dredge the berthing pockets for the amended quay line. As there is no alteration to the depths of the dredging (up to -11m CD in the berthing pocket, -9m CD in the approach channel and turning area), this does not induce additional effects on the marine Historic Environment at the location of any receptor.

18.4.7 The effects on the known heritage receptors are unchanged by the material amendments to the DCO, except that the magnetic anomaly site 167 is now located outside the berthing pocket but still within the dredging area, as the quay line has been set back at its northern end for the barge berth. The relationship of the new quay to the magnetic anomaly site 28 remains unchanged. The magnetic anomaly site 27 remains within the dredging area. Sites 22, 23, 24 and 29 remain under the new quay. Sites 22, 23 and 24 are merely recorded losses, and have no wreck material associated with their locations.

18.4.8 Similarly, the effects on geoarchaeological deposits containing palaeoenvironmental evidence remain unchanged, the only difference being the location of the berthing pocket.

Additional Operational Phase Effects

18.4.9 Operational phase impacts associated with marine Historic Environment will be unchanged from those considered in the original ES for the DCO application (original ES Para. 18.6.30 – 34).

Additional Cumulative Effects

18.4.10 There will be no additional cumulative effects associated with the marine Historic Environment beyond those identified within the original ES for the DCO (original ES Section 18.9).

Consideration of DCO

18.4.11 Following this review, it is concluded that the changes in baseline understanding and the changes to the scheme will not result in any new or significant increased effects on marine Historic Environment beyond those identified within the original ES for the DCO.

18.5.0 Requirement for Additional Mitigation

DCO Mitigation

18.5.1 Proposed mitigation measures for AMEP are set out in the original ES (original ES Section 18.7), and the 2012 WSI (Wessex Archaeology 2012a).

18.5.2 The original ES set out mitigation measure relevant to the marine historic environment in works relating to new quay and the berthing pocket, approach channel and turning area. For the new quay it stated:

'Detailed mitigation measures to accompany construction of the new quay are being set out in a Written Scheme of Investigation (WSI) for marine and intertidal archaeology that has been drafted to accompany this Environmental Statement. The WSI provides for a further phase of investigations to enable detailed design of mitigation measures, as well as an outline of the mitigation measures that will be provided. The mitigation measures set out in the WSI will include monitoring by NLC/English Heritage and make provision for post-investigation assessment, material conservation, archaeological analysis, interpretation and publication of significant results, and preparation and deposition of a publicly-accessible archive. The WSI is subject to the agreement of NLC and English Heritage. It is anticipated that implementation of the WSI will be secured through a condition' (original ES para. 18.7.4).

18.5.3 For the berthing pocket, approach channel and turning area it stated:

'Detailed mitigation measures to accompany dredging of the berthing pocket, approach channel and turning area are being set out in the Written Scheme of Investigation (WSI) for marine and intertidal archaeology referred to above' (original ES para. 18.7.5).

18.5.4 The 2012 WSI set out possible measures that could be carried out during the design phase to supplement archaeological information identified by studies carried out prior to submission of the licence application (Wessex Archaeology 2012a, Section 5.1). These could inform the detailed design of the archaeological mitigation to take place during and after construction of the Marine Energy Park and Compensation Site, to be set out in an updated WSI. The investigations suggested were:

- Review of existing geophysical data;
- Acquisition and interpretation of additional geophysical data;
- Geoarchaeological investigation, including the development of a deposit model taking account of previous work;
- Additional documentary research notably into the brick and tile yards and historic shipping records relating to the anchorage of Whitebooth Roads (off Killingholme);
- Investigation of unidentified foreshore sites;
- Diver-based investigations of geophysical anomalies;
- Development of dredge reporting protocol.

18.5.5 The 2012 WSI also set out measures that will be carried out during the construction phase, as well as further possible measures (Wessex Archaeology 2012a, Section 5.2). The measures that were stated will happen were:

- implementation of Dredge Reporting Protocol; and
- investigations in response to discoveries arising from Dredge Reporting Protocol.

18.5.6 Other possible measures included archaeological excavation and recording and recovery of archaeologically important material pre-construction, and intertidal watching briefs, marine-based watching briefs, and investigations in response to discoveries arising from watching briefs during construction.

Alternate or Additional Mitigation

18.5.7 No alternate or additional mitigation is required beyond that set out in the 2012 WSI (Wessex Archaeology 2012a).

18.6.0 Residual Effects

Construction Phase

18.6.1 Given the permanence of the effect upon marine Historic Environment receptors, there were no residual effects identified in the original ES with regard to the construction phase (Section 18.8 of original ES).

Operational Phase

18.6.2 Given the permanence of the effect upon marine Historic Environment receptors, there were no residual effects identified in the original ES with regard to the operational phase (Section 18.8 of original ES).

Consideration of DCO

18.6.3 Following this review, it is concluded that there are no changes to the Residual Effects previously identified within the original ES for the DCO.

18.7.0 Other Environmental Issues

18.7.1 This Section seeks to detail any considerations and environmental effects which have been identified with regard to the range of topics which have been introduced into EIA requirements through the EIA Regulations 2017. Where there are no such considerations or environmental effects, this is also specified below for clarity.

18.7.2 Refer to Chapter 25 for a summary of the 'Other Environmental Issues' identified across all of the technical assessments undertaken and the Chapters prepared as part of the ES.

Other Environmental Issues of Relevance

Infrastructure

18.7.3 The risks associated with Infrastructure are not of relevance to this Chapter.

Waste

18.7.4 The risks associated with Waste are not of relevance to this Chapter.

Population and Human Health

18.7.5 The risks associated with Population and Human Health are not of relevance to this Chapter.

Climate and Carbon Balance

18.7.6 The risks associated with Climate and Carbon Balance are not of relevance to this Chapter.

Risks of Major Accidents and/or Disasters

18.7.7 The risks associated with Risks of Major Accidents and/or Disasters are not of relevance to this Chapter.

Summary

18.7.8 With regards to the EIA regulations 2017, in terms of marine Historic Environment there are not considered to be any likely significant effects with regards to Other Environmental Issues.

18.8.0 Summary of Effects

18.8.1 The construction phase impacts altered by the change in quay design and dredging from the original ES are:

- Amended dredging operations in the Berthing Pocket.

18.8.2 The overall footprint of the quay is largely unchanged and as there is no alteration to the depths of the dredging in the in the Berthing Pocket, Approach Channel and Turning Area these changes do not induce additional effects on the marine Historic Environment to those assessed in the original ES.

18.8.3 Operational phase impacts associated with marine Historic Environment will be unchanged from those considered in the DCO application.

18.8.4 There will be no additional cumulative effects associated with the marine Historic Environment.

18.8.5 Given the permanence of the effect upon marine Historic Environment receptors, there were no residual effects identified in the original ES with regard to the construction phase or the operational phase. Following this review, it is concluded that there are no changes to the Residual Effects previously identified as part of the DCO.

18.8.6 The proposed material amendments will not alter the effects as identified within the original ES.

18.9.0 Conclusions

18.9.1 The impact of the material change on the historic environment are negligible. The risks to the marine Historic Environment can be adequately mitigated through the mitigation measures set out in the 2012 WSI (Wessex Archaeology 2012a).

18.9.2 The proposed material amendments will make no difference to the potential effects and no additional mitigation measures will be required to those set out in the 2012 WSI (Wessex Archaeology 2012a).

REFERENCES

- Emu 2010 North Killingholme Geophysical Report. Unpublished report no. 10/J/25/1695
- HM Government 2011 UK Marine Policy Statement
- Ministry of Housing, Communities and Local Government 2019 National Planning Policy Framework
- Wessex Archaeology 2011 Abel Marine Energy Park (AMEP), Humber Estuary: Geoarchaeological Recording and Sub-sampling. Unpublished report. Ref.:76490
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