RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Environmental Statement

Volume 7

Chapter 22 – Onshore Archaeology and Cultural Heritage (Revision 2) (Clean)

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02	109-111	22.6.1.5	Assessment of impacts from lighting during construction
02	112	22.6.2	Assessment of impacts from lighting during operation
02	112-117	22.6.2.1	Assessment of effects on individual heritage assets

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Glossary

Term	Definition
Concurrent Scenario	A potential construction scenario for the Projects where DBS East and DBS West are both constructed at the same time.
Cumulative Effects	The combined effect of the Projects in combination with the effects of a number of different (defined cumulative) schemes, on the same single receptor / resource.
Cumulative Effects Assessment (CEA)	The assessment of the combined effect of the Projects in combination with the effects of a number of different (defined cumulative) schemes, on the same single receptor/resource.
Cumulative Impact	The combined impact of the Projects in combination with the effects of a number of different (defined cumulative) schemes, on the same single receptor / resource.
Decommissioning Plan	A document which would define the extent of works, in relation to the onshore infrastructure, which are required to be undertaken at the end of the operational lifetime of the Projects. The plan would be subject to agreement with relevant stakeholders at the time.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Development Scenario	Description of how the DBS East and / or DBS West Projects would be constructed either in isolation, sequentially or concurrently.
Dogger Bank South (DBS) Offshore Wind Farms	The collective name for the two Projects, DBS East and DBS West.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the value, or sensitivity, of the receptor or resource in accordance with defined significance criteria.

Term	Definition
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Geoarchaeology	The application of earth science principles and techniques to the understanding of the archaeological record. Includes the study of soils and sediments and of natural physical processes that affect archaeological sites such as geomorphology, the formation of sites through geological processes and the effects on buried sites and artefacts.
Haul Road	The track along the Onshore Export Cable Corridor used by traffic to access different sections of the onshore export cable route for construction.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Horizontal Directional Drilling (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.

Term	Definition
Impact	Used to describe a change resulting from an activity via the Projects, i.e. increased suspended sediments / increased noise.
In Isolation Scenario	A potential construction scenario for one Project which includes either the DBS East or DBS West array, associated offshore and onshore cabling and only the eastern Onshore Converter Station within the Onshore Substation Zone and only the northern route of the onward cable route to the proposed Birkhill Wood National Grid Substation.
Jointing Bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point on the coastline at which the Offshore Export Cables are brought onshore, connecting to the onshore cables at the Transition Joint Bay (TJB) above mean high water.
Landfall Zone	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) and the Transition Joint Bays (TJBs) inclusive of all construction works, including the landfall compounds, Onshore Export Cable Corridor and intertidal working area including the Offshore Export Cables.
Link Boxes	An underground metal box placed within a concrete pit where the metal sheaths between adjacent export cable sections are connected and earthed, installed with a ground level manhole to allow access to the Link Box for regular maintenance or fault-finding purposes.
Mean High Water Springs (MHWS)	MHWS is the average of the heights of two successive high waters during a 24 hour period.
Mean Low Water Springs (MLWS)	MLWS is the average of the heights of two successive low waters during a 24 hour period.
National Policy Statement (NPS)	A document setting out national policy against which proposals for NSIPs will be assessed and decided upon.
Nationally Significant Infrastructure Project (NSIP)	Large scale development including power generating stations which requires development consent under the Planning Act 2008. An offshore wind farm project with a capacity of more than 100 MW constitutes an NSIP.

Term	Definition
Onshore Converter Stations	A compound containing electrical equipment required to transform HVDC and stabilise electricity generated by the Projects so that it can be connected to the electricity transmission network as HVAC. There will be one Onshore Converter Station for each Project.
Onshore Development Area	The Onshore Development Area for ES is the boundary within which all onshore infrastructure required for the Projects would be located including Landfall Zone, Onshore Export Cable Corridor, accesses, Temporary Construction Compounds and Onshore Converter Stations.
Onshore Export Cable Corridor	This is the area which includes cable trenches, haul roads, spoil storage areas, and limits of deviation for micro-siting. For assessment purposes, the cable corridor does not include the Onshore Converter Stations, Transition Joint Bays or temporary access routes; but includes Temporary Construction Compounds (purely for the cable route).
Onshore Export Cables	Onshore Export Cables take the electric from the Transition Joint Bay to the Onshore Converter Stations.
Onshore Substation Zone	Parcel of land within the Onshore Development Area where the Onshore Converter Station infrastructure (including the haul roads, Temporary Construction Compounds and associated cable routeing) would be located.
Onward Cable Connection	The cable corridor between the Onshore Substation Zone and the Proposed Birkhill Wood National Grid Substation.
Outline Onshore Written Scheme of Investigation (WSI)	Project specific document forming the agreement between the Applicants, the appointed archaeologists, contractors and the relevant stakeholders landward of MHWS. The document sets out the methods to mitigate the effects on all the known and potential archaeological receptors within the Hornsea Four onshore Order Limits.
Palaeolithic	500000 to 10000 BC The Old Stone Age defined by the practice of hunting and gathering and the use of chipped flint tools. This period is usually divided into Lower, Middle and Upper Palaeolithic.
Paleoenvironmental analysis	The study of sediments and the organic remains of plants and animals to reconstruct the environment of a past geological age.

Term	Definition
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Pleistocene	An epoch of the Quaternary Period (between about 2 million and 10,000 years ago) characterised by several glacial ages.
Preliminary Environmental Information Report (PEIR)	Defined in the EIA Regulations as information referred to in part 1, Schedule 4 (information for inclusion in environmental statements) which has been compiled by the applicants and is reasonably required to assess the environmental effects of the development.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of Receptors include species (or groups) of animals, plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Scoping Report	The report that was produced in order to request a Scoping Opinion from the Secretary of State.
Scoping Opinion	The report adopted by the Planning Inspectorate on behalf of the Secretary of State.
Sequential Scenario	A potential construction scenario for the Projects where DBS East and DBS West are constructed with a lag between the commencement of construction activities. Either Project could be built first.
Setting	The NPPF identifies setting as that which encompasses an asset's surroundings in which it is experienced. The extent of setting is not fixed and can contribute both positively and negatively to the heritage significance of an asset.
Temporary Construction Compound	An area set aside to facilitate construction of the Projects. These will be located adjacent to the Onshore Export Cable Corridor and within the Onshore Substation Zone, with access to the highway.
The Applicants	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).

Term	Definition
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South offshore wind farms).
Transition Joint Bay (TJB)	The Transition Joint Bay (TJB) is an underground structure at the landfall that houses the joints between the Offshore Export Cables and the Onshore Export Cables.

Acronyms

Term	Definition
ADBA	Archaeological Desk-Based Assessment
ADS	Archaeology Data Service
AfL	Agreement for Lease
ALS	Airborne Laser Scanning
APS	Air Photo Services Limited
BEIS	Business, Energy and Industrial Strategy
BP	Before Present
CAA	Conservation Area Appraisal
CEA	Cumulative Effects Assessment
CHIA	Cultural Heritage Impact Assessment
CIfA	Chartered Institute for Archaeologists
DBA	Desk-Based Assessment
DBS	Dogger Bank South
DCMS	Department of Culture, Media and Sport
DCO	Development Consent Order
DMV	Deserted Medieval Village
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group

Term	Definition
EU	European Union
GIS	Geographic Information System
GW	Gigawatt
HDD	Horizontal Directional Drilling
HECA	Historic Environment Character Area
HER	Historic Environment Record
IEMA	Institute of Environmental Management and Assessment
IHBC	Institute of Historic Building Conservation
km	Kilometre
LVIA	Landscape and Visual Impact Assessment
MHCLG	Ministry of Housing, Communities and Local Government
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MW	Megawatt
NHLE	National Heritage List of England
NMP	National Mapping Programme
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRHE	National Record of the Historic Environment
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary

Term	Definition
PAS	Portable Antiquities Scheme
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PPG	Planning Practice Guidance
SLVIA	Seascape, Landscape and Visual Impact Assessment
SoCC	Statement of Community Consultation
UK	United Kingdom
WSI	Written Scheme of Investigation
WTG	Wind turbine generator
WWII	World War Two
ZTV	Zone of Theoretical Visibility

22 Onshore Archaeology and Cultural Heritage

22.1 Introduction

1. This chapter of the Environmental Statement (ES) considers the likely significant effects of the Projects on Onshore Archaeology and Cultural Heritage. The chapter provides an overview of the existing environment for the proposed Onshore Development Area and wider study areas, followed by an assessment of likely significant effects for the construction, operation, and decommissioning phases of the Projects.

2. This chapter should be read in conjunction with the following linked chapters:

   - **Volume 7, Chapter 17 Offshore Archaeology and Cultural Heritage (application ref: 7.17)**;
   - **Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**;
   - **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23)**;
   - **Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)**;
   - **Volume 7, Chapter 25 Noise (application ref: 7.25)**; and
   - **Volume 7, Chapter 26 Air Quality (application ref: 7.26)**.

3. Additional information to support the Onshore Archaeology and Cultural Heritage assessment include:

   - **Volume 7, Appendix 22-1 Onshore Archaeology and Cultural Heritage Consultation Response; (application ref: 7.21.21.1)**;
   - **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**;
   - **Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**;
   - **Volume 7, Appendix 22-4 Heritage Walkover Survey Report (application ref: 7.22.22.4)**;
   - **Volume 7, Appendix 22-5 Onshore Infrastructure Settings Assessment (application ref: 7.22.22.5)**;
   - **Volume 7, Appendix 22-6 Geoarchaeological Desk Based Assessment (application ref: 7.22.22.6)**;

- **Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**;
- **Volume 7, Appendix 22-8 Interim Archaeological Evaluation Report (application ref: 7.22.22.8)**;
- **Volume 7, Appendix 22-9 Archaeological and Geoarchaeological Watching Brief and Deposit Model Report (application ref: 7.22.22.9)**; and
- **Volume 7, Appendix 22-10 Additional Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.10)**.

22.2 Consultation

4. Consultation with regard to Onshore Archaeology and Cultural Heritage has been undertaken in line with the general process described in **Volume 7, Chapter 7 Consultation (application ref: 7.7)** and the **Consultation Report (Volume 5, application ref: 5.1)**. The key elements to date include scoping, the ongoing Evidence Plan Process (EPP) via the Onshore Archaeology and Cultural Heritage Expert Topic Group (ETG) and the Preliminary Environmental information Report (PEIR).

5. The feedback received throughout this process has been considered in preparing the ES. This chapter has been updated following consultation in order to produce the final assessment submitted within the Development Consent Order (DCO) application. **Volume 7, Appendix 22-1 Onshore Archaeology and Cultural Heritage Consultation Response (application ref: 7.22.22.1)** provides a summary of the consultation responses received to date relevant to this topic, and details how the comments have been addressed within this chapter.

6. The consultation process is described further in **Volume 7, Chapter 7 Consultation (application ref: 7.7)**. Full details of the consultation process are presented in the **Consultation Report (Volume5, application ref: 5.1)**, which has been submitted as part of the DCO application.

22.3 Scope

22.3.1 Effects Scoped in and Scoped Out

7. Effects scoped into the chapter include:

- Direct, physical impact to designated heritage assets;
- Direct, physical, impact to non-designated heritage assets;
- Indirect, physical impact to designated heritage assets;
- Indirect, physical, impact to non-designated heritage assets;
- Changes to the setting of designated heritage assets which could affect their heritage significance;
- Changes to the setting of non-designated heritage assets which could affect their heritage significance; and
- Cumulative impacts.

8. It was originally proposed to scope out direct physical impacts to onshore heritage assets during the operation of the Projects. Following the receipt of the Planning Inspectorate Scoping Opinion this was scoped back in. No other matters are scoped out of the assessment.

22.3.2 Study Area

9. The Onshore Development Area consists of the following elements:

- A Landfall (within the Landfall Zone) at Skipsea;
- An approximately 35km long Onshore Export Cable Corridor (construction easement typically 75m wide, and extending to up to 90m at complex trenchless crossings), and associated Temporary Construction Compounds;
- Up to two Onshore Converter Stations (within the Onshore Substation Zone) to the southwest of Beverley; and
- An approximately 2.5km onward connection to the proposed Birkhill Wood National Grid Substation.

10. All elements of the Projects which fall within the intertidal area below Mean High Water Springs (MHWS) are assessed within **Volume 7, Chapter 17 Offshore Archaeology and Cultural Heritage (application ref: 7.17)**.

11. Two study areas have been agreed with the Historic Environment ETG for onshore archaeology and cultural heritage on the basis of:

- Non-Designated Heritage Assets Study Area – known non-designated heritage assets, potential buried archaeological remains and previously unrecorded above ground heritage assets within 500m of the Onshore Development Area (**Volume 7, Figure 22-1 (application ref: 7.22.1)**); and
- Designated Heritage Assets Study Area – designated heritage assets within 1km of the Onshore Development Area and 5km of the Onshore Substation Zone, to inform a setting assessment of heritage assets identified as potentially being affected by the development through a change in their setting (**Volume 7, Figure 22-1 (application ref: 7.22.1)**).

12. Potential effects from the presence of the offshore infrastructure are not considered likely due to the distance of offshore infrastructure from the coast and are therefore not assessed within this chapter.

22.3.3 Realistic Worst Case Scenario

22.3.3.1 General Approach

13. The realistic worst case design parameters for likely significant effects scoped into the EIA for the **Volume 7, Chapter 22 Onshore Archaeology and Cultural Heritage (application ref: 7.20)** assessment are summarised in **Table 22-1**. These are based on the project parameters described in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**, which provides further details regarding specific activities and their durations.

14. In addition to the design parameters set out in **Table 22-1**, consideration is also given to the different development scenarios still under consideration as set out in sections 22.3.3.2, 22.3.3.3 and 22.3.3.4.

Table 22-1 Realistic Worst Case Design Parameters

Impacts	Parameter			
	DBS East or DBS West In-Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
Construction				
Impact 1: Direct Physical Impact on (permanent change to) Designated Heritage Assets Impact 2: Direct Physical Impact on (permanent change to) Non-designated Heritage Assets Impact 3: Indirect Physical Impact on (permanent change to) Designated Heritage Assets Impact 4: Indirect Physical Impact on (permanent change to) Non-designated Heritage Assets	Landfall trenchless crossing (temporary works) physical parameters: • TJB Construction Compound works area: 110 x 75m • Transition Joint Bay dimensions: 5 x 20m • No. of Transition Joint Bays: 2 • Indicative trenchless crossing depth: 20m • Number of completed trenchless crossing ducts (maximum): 3 (2 *for* power cables plus 1 *for* fibre optic cables*)*	Landfall trenchless crossing (temporary works) physical parameters: • TJB Construction Compound works area: 190 x 75m • Transition Joint Bay dimensions: 5 x 20m • No. of Transition Joint Bays: 4 • Indicative trenchless crossing depth: 20m • Number of completed trenchless crossing ducts (maximum): 6 (4 *for* power cables plus 2 *for* fibre optic cables*)*	Landfall trenchless crossing (temporary works) physical parameters: • TJB Construction Compound works area: 190 x 75m • Transition Joint Bay dimensions: 5 x 20m • No. of Transition Joint Bays: 4 • Indicative trenchless crossing depth: 20m • Number of completed trenchless crossing ducts (maximum): 6 (4 *for* power cables plus 2 *for* fibre optic cables*)*	The worst case scenario represents the maximum footprint and ground disturbance within the Onshore Development Area in which potential direct physical disturbance to designated and non-designated heritage assets could occur. The Concurrent and Sequential Scenarios would involve a greater extent of construction works. Therefore, **the Projects Concurrently** and **Sequentially** scenarios are considered equally worst case and assessed in this Chapter.
	Onshore Export Cable Corridor from Landfall Zone to the Substation Zone construction physical parameters: • Indicative corridor length: 32km • Total onshore cable corridor works area (est.): 4,252,209m^2 • Cable corridor width: 41m • Cable corridor width at trenchless crossings: 45m • Maximum number of trenches: 2 • Maximum cable burial depth (where restrictions are not present): 2m • Indicative cable burial depth: 1.6m • Haul road width: 5m (increasing to 8m at passing places) • Jointing Bays: every 0.75 – 1.5km • Indicative number of Jointing Bays: 103	Onshore Export Cable Corridor from Landfall Zone to the Substation Zone construction physical parameters: • Indicative corridor length: 32km • Total onshore cable corridor works area (est.): 4,503,397m^2 • Cable corridor width: 75m • Cable corridor width at trenchless crossings: 90m • Maximum number of trenches: 4 • Maximum cable burial depth (where restrictions are not present): 2m • Indicative cable burial depth: 1.6m • Haul road width: 5m (increasing to 8m at passing places) • Jointing Bays: every 0.75 – 1.5km • Indicative number of Jointing Bays: 205	Onshore Export Cable Corridor from Landfall Zone to the Substation Zone construction physical parameters: • Indicative corridor length: 35km • Total onshore cable corridor works area (est.): 4,503,397m^2 • Cable corridor width: 75m • Cable corridor width at trenchless crossings: 90m • Maximum number of trenches: 4 • Maximum cable burial depth (where restrictions are not present): 2m • Indicative cable burial depth: 1.6m • Haul road width: 5m (increasing to 8m at passing places) • Jointing Bays: every 0.75 – 1.5km • Indicative number of Jointing Bays: 205	

Impacts	Parameter			
	DBS East or DBS West In-Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
	• Jointing Bay construction footprint (per bay): 10 x 25m • Jointing Bay burial depth from existing ground level to bottom of Jointing Bay: 2.2m • Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including the Landfall Zone satellite compound) • Size of main construction compound (m^2): 10,000 (roughly 100x100m) • Size of satellite construction compounds (m^2): 5,625 (roughly 75x75m)	• Jointing Bay construction footprint (per bay): 10 x 25m • Jointing Bay burial depth from existing ground level to bottom of Jointing Bay: 2.2m • Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including the Landfall Zone satellite compound) • Size of main construction compound (m^2): 10,000 (roughly 100x100m) • Size of satellite construction compounds (m^2): 5,625 (roughly 75x75)	• Jointing Bay construction footprint (per bay): 10 x 25m • Jointing Bay burial depth from existing ground level to bottom of Jointing Bay: 2.2m • Number of Temporary Construction Compounds: 17 (2 main compounds, 15 satellite compounds including the Landfall Zone satellite compound) • Size of main construction compound (m^2): 10,000 (roughly 100x100m) • Size of satellite construction compounds (m^2): 5,625 (roughly 75x75m)	
	Trenchless crossings physical parameters: • Maximum width of buried cable: 45m • Maximum trenchless crossing depth: 20m • No. of trenchless crossing: min 41 and maximum 147	Trenchless crossings physical parameters: • Maximum width of buried cable: 90m • Maximum trenchless crossing depth: 20m • No. of trenchless crossing: min 82 and maximum 294	Trenchless crossings physical parameters: • Maximum width of buried cable: 90m • Maximum trenchless crossing depth: 20m • No. of trenchless crossing: min 82 and maximum 294	
	Onshore Substation Zone (temporary works) physical parameters: • Total construction area: 94,000m^2 (based on one HVDC converter station + Temporary Construction Compound)	Onshore Substation Zone (temporary works) physical parameters: • Total construction area: 189,000m^2 (based on two HVDC converter stations + Temporary Construction Compound)	Onshore Substation Zone (temporary works) physical parameters: • Total construction area: 189,000m^2 (based on two HVDC converter stations + Temporary Construction Compound)	
Impact 5: Temporary Change to the Setting of Designated Heritage Assets which could affect	Landfall Zone: • Duration of works: 18 months overall (not continuous).	Landfall Zone: • Duration of works: up to 18 months overall (not continuous).	Landfall Zone: • Duration of works: up to 48 months overall (not continuous).	The worst case scenario represents the maximum duration in which temporary change to the setting of designated and non-designated heritage assets could occur.
	Onshore Export Cable Corridor: • Duration of works: 33 months.	Onshore Export Cable Corridor: • Duration of works: 33 months.	Onshore Export Cable Corridor:	

Impacts	Parameter			
	DBS East or DBS West In-Isolation	**DBS East and DBS West Concurrently**	**DBS East and DBS West Sequentially**	**Notes and Rationale**
their Heritage Significance Impact 6: Temporary Change to the Setting of Non-designated Heritage Assets which could affect their Heritage Significance			• Duration of works: up to 57 months overall (note this would not be continuous working within that timeframe).	The Sequential Scenario will result in the longest duration. Therefore, the **Projects Sequentially** Scenario is considered worst case and assessed in this Chapter.
	Onshore Substation Zone: • Duration of works: 4 years.	Onshore Substation Zone: • Duration of works: 4 years.	Onshore Substation Zone: • Duration of works: 6 years.	
Operation				
Impact 7: Permanent Change to the Setting of Designated Heritage Assets which could affect their Heritage Significance Impact 8: Permanent Change to the Setting of Non-designated Heritage Assets which could affect their Heritage Significance	Onshore Substation Zone parameters: • Permanent converter station area: 64,416m^2 (244 x 264m) (based on one HVDC converter station) Converter Station buildings: • Tallest building: 24m • Largest building footprint: 60 x 45m • Tallest structure: 27m height (lighting mast) Access road: • Number: 1 • Length: 1.1km • Width: 7.5m Operation duration: 30 years Lighting: security /operational lighting within the compound. Implementation of basic landscape screening.	Onshore Substation Zone parameters: • Permanent converter station area: 128,832m^2 (244 x 264m plus 244 x 264m) (based on two HVDC converter stations) Converter Station buildings: • Tallest building: 24m • Largest building footprint: 60 x 45m • Tallest structure: 27m height (lighting mast) Access road: • Number: 1 • Length: 1.1km • Width: 7.5m Operation duration: 30 years Lighting: security /operational lighting within the compound. Implementation of basic landscape screening.	Onshore Substation Zone parameters: • Permanent converter station area: 128,832m^2 (244 x 264m plus 244 x 264m) (based on two HVDC converter stations) Converter Station buildings: • Tallest building: 24m • Largest building footprint: 60 x 45m • Tallest structure: 27m height (lighting mast) Access road: • Number: 1 • Length: 1.1km • Width: 7.5m Operation duration: 32 years Lighting: security /operational lighting within the compound. Implementation of basic landscape screening.	The worst case scenario represents the maximum intrusive effect of the permanent above ground structures (i.e. maximum height and massing) in which a permanent change to the setting of designated and non-designated heritage assets could occur. The Concurrent and Sequential Scenarios will require two converter stations therefore will have greater effects than DBS West or DBS East In Isolation. The Sequential Scenario will result in a slightly longer operational duration, due to the assumed two-year lag in construction between the two Projects. Therefore, the **Projects Sequentially** Scenario is considered worst case

Impacts	Parameter			
	DBS East or DBS West In-Isolation	DBS East and DBS West Concurrently	DBS East and DBS West Sequentially	Notes and Rationale
				and assessed in this Chapter.
Decommissioning				
No final decision regarding the final decommissioning policy for the onshore project infrastructure including landfall, Onshore Export Cable Corridor and Onshore Converter Stations has yet been made. It is also recognised that legislation and industry best practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled wherever possible and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase. A Decommissioning Plan for the onshore works would be submitted prior to any decommissioning commencing.				

22.3.3.2 Development Scenarios

15. Following Statutory Consultation high voltage alternating current (HVAC) technology (previously assessed in PEIR) was removed from the Projects' design envelope (see **Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4**) for further information). As a result, only high voltage direct current (HVDC) technology has been taken forward for assessment purposes. The ES considers the following development scenarios:

- Either DBS East or DBS West is built In Isolation; or
- DBS East and DBS West are both built either Sequentially or Concurrently.

16. An In Isolation Scenario has been assessed within the ES on the basis that theoretically one Project could be taken forward without the other being built out. If an In Isolation Scenario is taken forward, either DBS East or DBS West may be constructed. As such the onshore assessment considers both DBS East and DBS West In Isolation.

17. If an In Isolation Scenario is taken forward, only the eastern Onshore Converter Station within the Onshore Substation Zone would be constructed. In either the Concurrent or Sequential Scenario, both Onshore Converter Station locations within the Onshore Substation Zone would be taken forward for the onshore assessment.

18. In order to ensure that a robust assessment has been undertaken, all development scenarios have been considered to ensure the realistic worst case scenario for each topic has been assessed. A summary is provided here, and further details are provided in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**.

19. The three development scenarios to be considered for assessment purposes are outlined in **Table 22-2.**

Table 22-2 Development Scenarios and Construction Durations

Development Scenario	Description	Total Maximum Construction Duration (Years)	Maximum construction Duration Offshore (Years)	Maximum construction Duration Onshore (Years)
In Isolation	Either DBS East or DBS West is built In Isolation	Five	Five	Four
Sequential	DBS East and DBS West are both built sequentially, either Project could commence construction first with staggered / overlapping construction	Seven	A five year period of construction for each project with a lag of up to two years in the start of construction of the second project (excluding landfall duct installation) – reflecting the maximum duration of effects of seven years.	Construction works (i.e. onshore cable civil works, including duct installation) to be completed for both Projects simultaneously in the first four years, with additional works at the landfall, substation zone and cable joint bays in the following two years. Maximum duration of effects of six years.
Concurrent	DBS East and DBS West are both built Concurrently reflecting the maximum peak effects	Five	Five	Four

20. Any differences between the Projects, or differences that could result from the manner in which the first and the second Projects are built (Concurrent or Sequential and the length of any lag) are identified and discussed where relevant in section 22.6. For each potential impact, the worst case construction scenario for the In Isolation Scenario and the Concurrent or Sequential scenario is presented. The worst case scenario presented for the Concurrent or Sequential scenario will depend on which of these is the worst case for the potential impact being considered. The justification for what constitutes the worst case is provided, where necessary, in section 22.6.

22.3.3.3 Operation Scenarios

21. Operation scenarios are described in detail in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**. The assessment considers the following scenarios:

- Only DBS East in operation;
- Only DBS West in operation; and
- DBS East and DBS West operating Concurrently with or without a lag of up to two years between each Project commencing operation.

22. If the Projects are built using a phased approach, there would also be a phased approach to starting the operational phase. The worst case scenario for the operational phases for the Projects has been assessed. See section 5.1.1 of **Volume 7, Chapter 5 Project Description (application ref: 7.5)** for further information on phasing scenarios for the Projects.

23. The operational lifetime of each Project is expected to be 30 years for In Isolation and Concurrent and 32 years for Sequential Scenario.

22.3.3.4 Decommissioning Scenarios

24. Decommissioning scenarios are described in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**. Decommissioning arrangements will be agreed through the submission of a Decommissioning Plan to be submitted and approved following cessation of commercial operation prior to decommissioning commencing. For the purpose of this assessment it is assumed that decommissioning of the Projects could be conducted separately, or at the same time.

22.3.4 Embedded Mitigation

25. This section outlines the embedded mitigation relevant to the Onshore Archaeology and Cultural Heritage assessment, which has been incorporated into the design of the Projects or constitutes standard mitigation measures for this topic (**Table 22-3**). Mitigation is also detailed

within the **Commitments Register (Volume 8, application ref: 8.6)** and cross-referenced within **Table 22-3**. Where additional mitigation measures are proposed, these are detailed in the impact assessment (section 22.6).

Table 22-3 Embedded Mitigation Measures

Parameter	Embedded Mitigation Measures	Where commitment is secured
Mitigation by site selection	The site selection process has included consideration of all designated heritage assets and has avoided any direct physical impacts upon designated heritage assets as part of the site selection process. The site selection process has also sought to avoid all direct physical impacts on non-designated and potential heritage assets, where possible, using the datasets available at the time of assessment. Where this has not been possible, site selection has been done to minimise direct impacts on known non-designated and potential heritage assets. The site selection process is described in detail in **Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4)**.	DCO Schedule 1
Sequential build efficiencies	For the Sequential build of DBS East and DBS West the cable ducts for both Projects will be laid as part of the first project. This will help reduce any impacts associated with temporary change to the setting of designated and non-designated heritage assets along the Onshore Export Cable Corridor for the Sequential build scenario.	DCO Schedule 1

Parameter	Embedded Mitigation Measures	Where commitment is secured
Outline Onshore Written Scheme of Investigation (WSI)	An Outline Onshore WSI **(Volume 8, application ref: 8.14)** is submitted alongside the ES to accompany the DCO application. This document outlines the strategy to undertake additional programmes of survey and evaluation post-consent and will include a range of likely mitigation options and responses to be utilised under various scenarios.	DCO Requirement 18
Mitigation by avoidance	A total of 18 areas were highlighted as areas of possible high archaeological significance from the Phase 1 geophysical surveys. These fed into route refinement and micro-siting of the Onshore Export Cable Corridor with a total of nine areas being totally or partially avoided within the final Onshore Development Area. Further detail on onshore archaeology and cultural heritage input into route refinement is outlined in **Volume 7, Chapter 4 Site Selection and Assessment of Alternatives (application ref: 7.4)**.	DCO Schedule 1

26. As the EIA has progressed, further route refinement and micro-siting has been carried out, informed directly by the results of ongoing archaeological surveys i.e. geophysical survey to ensure areas of high archaeological potential are avoided, wherever possible within the confines of engineering and other environmental constraints. This includes a diversion around Nunkeeling Deserted Medieval Village as well as micro-siting the Onshore Export Cable Corridor around anomalies of probable archaeological origin identified in the Phase 1 geophysical survey anomalies. The Onshore Substation Zone boundary was also refined following the Phase 1 archaeological trial trenching which identified significant archaeological activity in the southeast section.

27. A total of 18 areas were highlighted as areas of high archaeological potential from the Phase 1 geophysical surveys. These fed into route refinement and micro-siting of the Onshore Export Cable Corridor with a total of nine areas being totally or partially avoided within the final Onshore Development Area.

28. **Volume 7, Figure 22-5a-h (application ref: 7.22.1)** shows the extent of the 943ha of geophysical survey coverage used in route refinement, along with areas of identified geophysical anomalies (based on available data coverage at that time).

29. As part of the embedded mitigation, the Projects have submitted a project-specific **Outline Onshore WSI** (**Volume 8, application ref: 8.14)** as part of the final DCO submission, outlining a commitment to undertake additional programmes of survey and evaluation post-consent to inform the archaeological mitigation requirements. The Outline Onshore WSI has been prepared in consultation with the Historic Environment ETG and in accordance with industry good practice guidance provided by the Chartered Institute for Archaeologists (CIfA).

22.4 Assessment Methodology

22.4.1 Policy, Legislation and Guidance

22.4.1.1 National Policy Statements

30. The assessment of likely significant effects upon onshore archaeology and cultural heritage has been made with specific reference to the relevant National Policy Statements (NPS) Including the Overarching NPS for Energy (EN-1), the NPS for Renewable Energy Infrastructure (EN-3) and the NPS for Electricity Networks Infrastructure (EN-5). These were published in November 2023 and were designated in January 2024.The specific assessment requirements for onshore archaeology and cultural heritage, as detailed in the NPS, are summarised in **Table 22-4** together with an indication of the section of the ES chapter where each is addressed.

Table 22-4 NPS Assessment Requirements

NPS Requirement	NPS Reference	ES Section Reference
EN-1 NPS for Energy		
'As part of the Environmental Statement (ES) the applicants should provide a description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance. The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on the significance of the heritage asset.'	Section 5.9.10	The likely significant heritage impacts have been considered in this chapter and are detailed in section 22.6. An assessment of cumulative impacts is detailed in section 22.8
'Where a site on which development is proposed includes, or the available evidence suggests it has the potential to include, heritage assets with an archaeological interest, the applicants should carry out appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation. Where proposed development will affect the setting of a heritage asset, accurate representative visualisations may be necessary to explain the impact.'	Section 5.9.11	Section 22.6 has been informed by an Archaeological Desk Based Assessment (ADBA) (**Volume 7, Appendix 22-2 (application ref: 7.22.22.2)**), Aerial Photograph assessment (**Volume 7, Appendix 22-3 (application ref: 7.22.22.3)**), Heritage Walkover Survey Report (**Volume 7, Appendix 22-4 (application ref: 7.22.22.4)**), Settings Assessment (**Volume 7, Appendix 22-5 (application ref: 7.22.22.5)**), Geoarchaeological Desk Based Assessment (GDBA) (**Volume 7, Appendix 22-6 (application ref: 7.22.22.6)**) and Geophysical Survey (**Volume 7, Appendix 22-7 (application ref: 7.22.22.7)**).

NPS Requirement	NPS Reference	ES Section Reference
'The applicants should ensure that the extent of the impact of the proposed development on the significance of any heritage assets affected can be adequately understood from the application and supporting documents.'	Section 5.9.12	The ES chapter provides an account of the potential impact of the Projects upon heritage assets and their significance (section 22.6).
The applicants are encouraged, where opportunities exist, to prepare proposals which can make a positive contribution to the historic environment, and to consider how their scheme takes account of the significance of heritage assets affected. This can include, where possible: • enhancing, through a range of measures such as sensitive design, the significance of heritage assets or setting affected. • considering measures that address those heritage assets which are at risk or which may become at risk, as a result of the Scheme. • considering how visual or noise impacts can affect heritage assets, and whether there may be opportunities to enhance access to, or interpretation, understanding and appreciation of, the heritage assets affected by the scheme.	Paragraph 5.9.13	Potential opportunities for enhancement of the archaeological record will be outlined as appropriate within the **Outline Onshore WSI (Volume 8, application ref: 8.14)**.
'Careful consideration in preparing the scheme will be required on whether the impacts on the historic environment will be direct or indirect, temporary, or permanent.'	Section 4.9.14	This ES chapter provides an assessment of potential impacts, including direct, indirect, temporary, or permanent in Section 25.6.

NPS Requirement	NPS Reference	ES Section Reference
EN-3 NPS for Renewable Energy Infrastructure		
'Consultation with the relevant statutory consultees should be undertaken by the applicants at an early stage of the development.'	Section 3.10.104	Regular consultation has been undertaken with the relevant statutory consultees, and through the application of the Evidence Plan Process (EPP), as outlined in **Volume 7, Appendix 22-1 (application ref: 7.22.22.1)**. Consultation will be ongoing throughout the EIA process.
Assessment should be undertaken as set out in section 5.9 of EN-1. Desk-based studies should take into account any geotechnical or geophysical surveys that have been undertaken to aid the wind farm design.	Section 3.10-.102	The ES chapter has been undertaken in accordance with section 5.9of EN-1, as detailed above. This chapter has been informed by available geophysical survey information (**Volume 7, Appendix 22-7 (application ref: 7.22.22.7)**).
EN-5 NPS for Electricity Networks Infrastructure		
…developers will be influenced by Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to "have regard to the desirability… of protecting sites, buildings and objects of architectural, historic or archaeological interest; and… do what [they] reasonably can to mitigate any effect which the proposals would have on the… sites, buildings or objects."	Paragraph 2.2.10	Potential impacts upon sites and objects of archaeological interest onshore are set out in section 22.6 along with a proposed approach to mitigation.

22.4.1.2 Other

31. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of Onshore Archaeology and Cultural Heritage. Further detail is provided in **Volume 7, Chapter 3 Policy and Legislative Context (application ref: 7.3)**.

22.4.1.2.1 Legislation

32. Works affecting Listed Buildings and Conservation Areas are subject to the Planning (Listed Buildings and Conservation Areas) Act 1990, while those affecting Scheduled Monuments and Archaeological Areas of Importance must consider the Ancient Monuments and Archaeological Areas Act 1979.

33. In the context of listed buildings, Regulation 3 of the Infrastructure Planning (Decisions) Regulations 2010 (the 'Decisions Regulations') sets out that it is necessary for the Secretary of State (SoS) to "*have regard to the desirability of preserving the listed building or its setting or any features of special architectural or historic interest which it possesses*". This language differs from the duty in section 66 of the Planning (Listed Buildings and Conservation Areas) Act 1990 (PLBCAA) for a decision maker to have "*special regard*" and indicates that Parliament intends that a particular approach be taken in the case of NSIPs. With regard to scheduled monuments, Regulation 3 states the Secretary of State *"must have regard to the desirability of preserving the scheduled monument or its setting.*"; and in relation to conservation areas, Regulation 3 states the Secretary of State *"must have to the desirability of preserving or enhancing the character or appearance of that area.*". The Decisions Regulations have been taken into account in the preparation of this chapter.

34. Additionally, certain hedgerows may be deemed to be historically important under the criteria set out in the Hedgerow Regulations 1997. These hedgerows are illustrated within **Volume 2, Tree Preservation Order and Hedgerow Plan (Revision 3)** [AS-026]. This plan has been amended to include all hedgerows that meet the criteria set out in Schedule 1, Part II of the Hedgerow Regulations for Importance on archaeological and historic grounds, which had been omitted in the earlier version of this figure. The criteria used within the Hedgerow Regulations, while allowing for an evidential test of the antiquity of a hedgerow, do not consistently provide a basis for understanding its significance, either as an individual hedgerow or as an element of a historic field system, and many hedgerows of greater significance may not meet the criteria for being deemed Important under the regulations. Consequently, for the purposes of the EIA, effects on hedgerows, whether Important or not, have been considered (at **Section**

22.5.13 below) in terms of their contribution to historic landscape character.

22.4.1.2.2 Policy

35. This assessment has also been undertaken in a manner consistent with the NPPF, a revised version of which was published by the Ministry of Housing, Communities and Local Government (MHCLG) in September 2023, replacing the original policy from March 2012. Provision for the historic environment is principally given in section 16: Conserving and enhancing the historic environment, which directs local authorities to set out "*a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats*". Local planning authorities should recognise that heritage assets are "*an irreplaceable resource and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations*" (MHCLG, 2023).

36. The aim of NPPF section 16 is to ensure that Regional Planning Bodies and local authorities, developers and owners of heritage assets adopt a consistent and holistic approach to their conservation and to reduce complexity in planning policy relating to proposals that affect them.

37. To summarise, UK government guidance provides a framework which:

- Recognises that heritage assets are an irreplaceable resource;
- Requires applicants to provide a level of detail that is proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance;
- Takes into account the desirability of sustaining and enhancing the significance of heritage assets, including any contribution made by their setting, and putting them to viable uses consistent with their conservation;
- Places weight on the conservation of designated heritage assets (which include world heritage sites, scheduled monuments, listed buildings, protected wreck sites, registered parks and gardens, registered battlefields or conservation areas), with any anticipated substantial harm weighed against the public benefits of the proposal;
- Requires applicants to include a consideration of the effect of an application on the significance of non-designated heritage assets, giving regard to the scale of any harm or loss and the significance of the heritage asset;

- Regard proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) favourably; and
- Requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible.

38. The NPPF's associated Planning Practice Guidance (PPG) 'Conserving and enhancing the historic environment', published in 2014 and updated in 2019, (MHCLG, 2019) includes further information and guidance on how national planning policy is to be interpreted and applied locally.

39. Although the NPPF and PPG are important and relevant considerations with respect to the Projects, EN-1 (the Overarching NPS for Energy) is the key decision-making document.

40. This chapter also accounts for local and regional policy relevant to the study area and the Projects. The Projects are located within the unitary authority of East Riding of Yorkshire. East Riding of Yorkshire Council adopted the East Riding Local Plan in April 2016. This contains the following policy relating to archaeology and cultural heritage:

Policy ENV3: Valuing our heritage

A. Where possible, heritage assets should be used to reinforce local distinctiveness, create a sense of place, and assist in the delivery of the economic well-being of the area. This can be achieved by putting assets, particularly those at risk, to an appropriate, viable and sustainable use.

B. The significance, views, setting, character, appearance and context of heritage assets, both designated and non-designated, should be conserved, especially the key features that contribute to the East Riding's distinctive historic character including:

1. Those elements that contribute to the special interest of Conservation Areas, including the landscape setting, open spaces, key views and vistas, and important unlisted buildings identified as contributing to the significance of each Conservation Area in its appraisal;
2. Listed Buildings and their settings;
3. Historic Parks and Gardens and key views in and out of these landscapes;

4. The dominance of the church towers and spires as one of the defining features of the landscape, such as those of Holderness and the Wolds;
5. Heritage assets associated with the East Yorkshire coast and the foreshore of the Humber Estuary;
6. The historic, archaeological and landscape interest of the Registered Battlefield at Stamford Bridge;
7. The historic cores of medieval settlements, and, where they survive, former medieval open field systems with ridge and furrow cultivation patterns;
8. The nationally important archaeology of the Yorkshire Wolds; and
9. Those parts of the nationally important wetlands where waterlogged archaeological deposits survive.

C. Development that is likely to cause harm to the significance of a heritage asset will only be granted permission where the public benefits of the proposal outweigh the potential harm. Proposals which would preserve or better reveal the significance of the asset should be treated favourably.

D. Where development affecting archaeological sites is acceptable in principle, the Council will seek to ensure mitigation of damage through preservation of the remains *in situ* as a preferred solution. When *in situ* preservation is not justified, the developer will be required to make adequate provision for excavation and recording before or during development.

22.4.1.2.3 Standards and Guidance

41. Standards and guidance are given by the Government on how the historic environment can be enhanced and conserved through the planning process and several standard and guidance documents have been produced by Historic England and CifA regarding assessing the Historic Environment and implementing a best practice approach.

Table 22-5 Standards and Guidance

Guidance	Relevance to Assessment
Conserving and enhancing the historic environment (Ministry of Housing, Communities & Local Government (2014, updated 2019)	Sets out advice to ensure the Government's policies on protecting and enhancing the historic environment are understood and followed when making planning decisions. The advice details the main legislative framework for planning and the historic environment, followed by details on how planning decisions should consider the historic environment.
The Historic Environment in Local Plans: Historic Environment Good Practice Advice in Planning 1 (Historic England, 2015a)	Details the processes involved in the decision-making process for the historic environment at a local planning level, providing guidance in implementing the NPPF requirements. Guidance within the document is relevant to ensuring data and documentation for the historic environment is of the standard required.
Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning 2 (Historic England, 2015b)	Provides advice and guidance on assessing the significance of heritage assets, and how to understand the nature, extent and level of significance. It provides guidance on how to understand the impact of a proposed development on the heritage significance of an asset and how to identify ways to avoid, minimise or mitigate that impact which meets the objectives of the NPPF.
The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning 3 (Historic England, 2017a)	Provides guidance on establishing the setting of a heritage asset, how that setting contributes to the asset's significance, and to what extent a proposed development might impact upon an asset's significance.

Guidance	Relevance to Assessment
Standard and guidance for historic environment desk-based assessment (CifA, 2020)	Provides guidance for the compilation and assessment of baseline historic environment data. It includes guidance on what should and should not be included in a DBA.
Code of Conduct (CifA, 2014)	Promotes the standards of conduct and self-discipline required of a member in the interests of the public and in pursuit of the study and care of the physical evidence of the human past.
Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC and CifA, 2021)	Authoritative set of principles that promotes good practice in cultural heritage impact assessment.
Commercial Renewable Energy Development and the Historic Environment. Historic England Advice Note 15 (Historic England, 2021)	Provides guidance on how the historic environment is taken fully into account during the planning and delivery of commercial renewable energy developments.
Preserving Archaeological Remains. Decision-taking for Sites under Development (Historic England, 2016)	Provides guidance on how to retain and protect archaeological sites beneath or within the development. It has a particular focus on decision-taking on waterlogged archaeological sites.
Piling and Archaeology. Guidance and Good Practice (Historic England, 2019)	Provides guidance on how to make clear and informed decisions about piling schemes and their potential impact upon archaeological remains. It provides information on piling types, impacts, and solutions for sustainable foundation design.

22.4.2 Data and Information Sources

22.4.2.1 Site Specific Surveys

42. In order to provide site specific and up to date information on which to base the impact assessment, an assessment of aerial photographic and LiDAR data and historic map regression, a heritage walkover survey and geoarchaeological desk-based assessment were undertaken. An archaeological geophysical survey has been carried out across the Onshore Development Area, the results of which are presented in this chapter.

43. The heritage walkover survey was undertaken at targeted locations within the Onshore Development Area to inform the historic environment baseline and to confirm the presence/absence of heritage assets identified on the Humber HER. It consisted of a condition survey to record the extent and level of survival of the structures, earthworks and cropmarks recorded in the Humber HER (**Volume 7, Appendix 22-4 Heritage Walkover Survey Report (application ref: 7.22.22.4)**).

44. In total, 80 areas were selected within the Onshore Development Area; however only 63 areas were accessible (or observable from field boundaries or public rights of way) at the time of the survey. A further site visit was undertaken following the refinement of the Onshore Development Area to incorporate areas where land access was previously restricted. The heritage walkover survey took place over four days, from 5th to 8th December 2022 and the subsequent walkover took place from 22nd to 23rd October 2023.

45. The aims of the heritage walkover survey were to:

- Assess the condition of previously recorded upstanding/above ground archaeological remains within the identified areas (i.e. earthworks or structures);
- Identify any currently unrecorded heritage assets (i.e. earthworks or structures);
- Inform the potential for currently unknown heritage assets (e.g. buried archaeology) within the Onshore Development Area; and
- To assess the potential impact from other modern developments within the study areas which may have reduced the significance/preservation of known heritage assets.

46. The aim of the ongoing archaeological geophysical survey is to locate, record and characterise any surviving sub-surface archaeological remains that would enhance current understanding of the archaeological resource within the Onshore Development Area.

47. A total of 25 areas, covering 943ha, were identified as requiring a priority (phase 1) archaeological geophysical survey. These areas were targeted based on known locations of recorded heritage assets relating to buried archaeology within the Humber Historic Environment Record (HER) and as identified from aerial photographic data. The 25 areas included possible landfall locations and Onshore Substation Zones under consideration at the time the survey programme was devised. The areas were identified using an earlier iteration of the Onshore Development Area which has since undergone further refinement as part of detailed site selection and route refinement works, therefore not all the areas are within the current Onshore Development Area.

48. As the survey programme progressed during 2023 the focus of attention moved from surveying just the Priority Areas, to the remainder of the Onshore Development Area. The survey programme has worked flexibly around available land access, and suitability of ground conditions, in order to gain the maximum amount of survey coverage possible within the Onshore Development Area.

49. Initial survey was undertaken within the PEIR boundary which covered an area of 1200ha. A total of approximately 943ha across seventeen of the 25 Priority Areas, the PEIR Boundary and the updated Onshore Development Area has been investigated to date by magnetic gradiometry.

50. The final Onshore Development Area covers an area of 455ha of which approximately 434ha is suitable for geophysical survey (excluding roads, woodland, hedges etc), 339ha of which has been surveyed as of 16 January 2024, a summary of which is presented in section 22.6.

22.4.2.2 Other Available Sources

51. Other sources that have been used to inform the assessment are listed in **Table 22-6**.

Table 22-6 Other Available Data and Information Sources

Data Set	Spatial Coverage	Notes
National Heritage List for England (NHLE)	England	Official, up to date, register of all nationally protected historic buildings and sites in England – listed buildings, scheduled monuments, registered parks and gardens, and battlefields.

Data Set	Spatial Coverage	Notes
Humber Historic Environment Record	East Riding of Yorkshire and Hull	HERs are information services that provide access to comprehensive and dynamic resources relating to the archaeology and historic built environment of a defined geographic area. HERs contain details on local archaeological sites and finds, historic buildings and historic landscapes and are regularly updated.
CITiZAN Dataset	Humberside	The Coastal and Intertidal Zone Archaeological Network holds records for foreshore and intertidal sites across England's coast.
Conservation Areas	East Riding of Yorkshire	East Riding of Yorkshire Council holds information on Conservation Areas including locally listed buildings.
Relevant Regional, Local and Period Archaeological Studies and Journals	UK	Historic and archaeological data consulted to inform the wider baseline context. The studies/journals consulted do not constitute an exhaustive account of all historical/archaeological data identified within the study area.
The Archaeology Data Service	UK	A non-exhaustive directory of archaeological research consulted to inform the wider baseline context and previous archaeological investigations in the study area.

Data Set	Spatial Coverage	Notes
Cartographic sources (the East Riding Archives, National Mapping Programme and Envirocheck Report)	East Riding of Yorkshire	Historic mapping for the study area including 19th century Enclosure and Tithe maps, and 1st, 2nd and later edition Ordnance Survey maps. Some cartographic data is fragmentary for the study area. This chapter integrates the results of the Map Regression analysis undertaken by Air Photo Services. The full report is included in **Volume 7, Appendix 22-3 (application ref: 7.22.22.3)**.
Aerial Photographic Data (Historic England Archive and the Humber HER, and ortho-rectified mosaics of vertical aerial photographs at Google Earth)	East Riding of Yorkshire	Aerial photographic data for the study area. This chapter integrates the results of the Aerial Photographic assessment undertaken by Air Photo Services. The full report is included in **Volume 7, Appendix 22-3 (application ref: 7.22.22.3)**.
Light Detection and Ranging (LiDAR) survey data	East Riding of Yorkshire	Available LiDAR data for the study area. This chapter integrates the results of the LiDAR assessment undertaken by Air Photo Services. The full report is included in **Volume 7, Appendix 22-3 (application ref: 7.22.22.3)**.
British Geological Survey (BGS) data (surface geology)	UK	Historic borehole logs and wider geological background for the study area. This chapter integrates the results of the GDBA undertaken by AOC Archaeology. The full report is included in **Volume 7, Appendix 22-6 (application ref: 7.22.22.6)**.

Data Set	Spatial Coverage	Notes
Zone of Theoretical Visibility (ZTV)	Study Area	ZTVs for the permanent above ground infrastructure required by the Projects to inform the initial setting assessments – details of the ZTVs are provided in **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23)**.

22.4.3 Impact Assessment Methodology

52. The impact assessment methodology adopted for Onshore Archaeology and Cultural Heritage will define heritage assets and their settings, likely to be impacted by the Projects and will assess the level of any resulting benefit, harm or loss to their significance. The assessment is not limited to direct (physical) impacts, but also assesses possible indirect (physical) impacts upon heritage assets which may arise as a result of changes to hydrological processes and changes to the setting of heritage assets, whether visually, or in the form of noise, dust and vibration, spatial associations and a consideration of historic relationships between places which may impact their significance.

53. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** provides a summary of the general impact assessment methodology applied. The following sections describe the specific methods used to assess the likely significant effects on Onshore Archaeology and Cultural Heritage.

54. As set out in Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC and CifA, 2021), Cultural Heritage Impact Assessment (CHIA) is concerned with "*understanding the consequences of change to cultural significance*". The principles of assessment are:

- A. understanding cultural heritage assets; and
- B. evaluating the consequences of change.

55. Understanding cultural heritage assets distinguishes between:

- Describing the asset (what it is and what is known about it);
- Ascribing cultural significance (a description of what is valued about it); and
- Attributing importance (a scaled measure of the degree to which the cultural significance of that asset should be protected).

56. Evaluating the consequences of change additionally distinguishes between three separate analytical stages:

- Understanding change (a factual statement of how a proposal would change a cultural heritage asset or its setting, including how it is experienced);
- Assessing impact (a scaled measure of the degree to which any change would impact on cultural significance); and
- Weighting the effect (the measure that brings together the magnitude of the impact and the cultural heritage asset's importance).

57. The three stages of 'understanding cultural heritage assets' (a description of the assets and their cultural significance, including the contribution of setting to that significance, and attributing importance) are described in section 22.5 (Existing Environment). An evaluation of the consequences of change is presented in section 22.6 (Assessment of Significance) as set out below.

58. **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** sets out the following steps in assessing significant effects:

- Identify the source of potential impacts and establishing if a pathway exists between the source of the impact and the identified receptors;
- Identify the sensitivity of each receptor to the relevant impacts;
- Identify the magnitude of the impact predicted; and
- Consider the receptor sensitivity and likely impact magnitude, in order to assess the likely significance of effect for the potential impact.

59. The relationship between the CHIA stages and the general impact assessment methodology, as set out in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)**, is as follows:

60. In CHIA, *identifying the source of potential impacts* is represented by a factual statement of how a proposal would change a cultural heritage asset or its setting (understanding change). It is important to note that change may or may not lead to an impact on cultural significance. If there is a pathway for an impact on cultural significance, this will be articulated for each impact.

61. *Identify the sensitivity* of a receptor equates to the measure of importance ascribed to an asset (or group of assets).

62. The sensitivity of a receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. However, while impacts to a heritage asset's setting or character can be temporary,

impacts which result in damage or destruction of the assets themselves, or their relationship with their wider environment and context, are permanent. Once destroyed an asset cannot recover. On this basis, it is the importance of a heritage asset (as a scaled measure of the degree to which we seek to protect and preserve the cultural significance of that asset through, for example, legislation and planning policy) rather than the sensitivity which forms the basis for assessment.

63. For the purposes of this EIA, the criteria for determining the heritage importance of any relevant heritage assets are described in **Table 22-7**.

Table 22-7 Definition of Importance for Cultural Heritage Assets

Importance	Definition
High	Assets perceived of being of international/national importance including: • World Heritage Sites • Scheduled Monuments • Grade I and II* Listed Buildings or structures • Designated historic landscapes of outstanding interest • Conservation Areas containing buildings or structures with high heritage importance, or high concentrations of listed buildings • Non-designated assets of acknowledged international / national importance • Assets that can contribute significantly to acknowledged international/national research objectives • Assets where the importance/existence/level of survival of the asset has not been ascertained (or fully ascertained/understood) from available evidence and is considered of high importance as a precautionary measure
Medium	Assets perceived of being of regional/national importance including: • Grade II Listed Buildings or structures • Designated special historic landscapes • Other types and character of Conservation Areas (i.e. not containing buildings or structures with high heritage importance, or high concentrations of listed buildings)

Importance	Definition
	• Assets that contribute to regional research objectives • Assets with regional value, educational interest, or cultural appreciation
Low	Assets perceived of being of local importance including: • 'Locally Listed' buildings or structures • Assets that contribute to local research objectives • Assets with local value, educational interest, or cultural appreciation • Assets compromised by poor preservation and/or poor contextual associations
Negligible	• Assets with no significant value or archaeological/historical interest

64. *Identify the magnitude* of the impact equates to the degree to which cultural significance is positively or negatively changed by the proposal.

65. The magnitude of adverse impact with respect to Onshore Archaeology and Cultural Heritage directly relates to the extent of harm to, or loss of, key elements of the asset's cultural significance, which may include its setting. The magnitude of beneficial impact directly relates to the level of public benefit associated with an individual impact. Benefits may correspond directly to the project itself where a project will enhance the historic environment (e.g. through measures which will improve the setting of a heritage asset or public access to it). Alternatively, benefits may occur based on data gathering exercises undertaken for the purpose of a project which will enhance public understanding by adding to the archaeological record (e.g. through the accumulation of publicly available information and data).

66. The criteria used for assessing the magnitude of impact regarding Onshore Archaeology and Cultural Heritage are presented in **Table 22-8**.

Table 22-8 Definition of Magnitude of Impact to Heritage Assets

Magnitude	Definition
High Adverse	Key elements of the asset's fabric and/or setting are lost or fundamentally altered, such that the asset's cultural significance is lost or severely compromised.

Magnitude	Definition
Medium Adverse	Elements of the asset's fabric and/or setting which contribute to its significance are affected, but to a more limited extent, resulting in an appreciable but partial loss of the asset's cultural significance.
Low Adverse	Elements of the asset's fabric and/or setting which contribute to its cultural significance are affected, resulting in a slight loss of cultural significance.
Negligible	The asset's fabric and/or setting is changed in ways which do not materially affect its cultural significance.
Low Beneficial	Elements of the asset's physical fabric which would otherwise be lost, leading to a slight loss of cultural significance, are preserved *in situ*; or Elements of the asset's setting are improved, slightly enhancing its cultural significance; or Research and recording leads to a slight enhancement to the archaeological or historical interest of the asset. This only applies in situations where the asset would not be otherwise harmed i.e. it is not recording in advance of loss.
Medium Beneficial	Elements of the asset's physical fabric which would otherwise be lost, leading to an appreciable but partial loss of cultural significance, are preserved *in situ*; or Elements of the asset's setting are considerably improved, appreciably enhancing its cultural significance; or Research and recording leads to a considerable enhancement to the archaeological or historical interest of the asset. This only applies in situations where the asset would not be otherwise harmed i.e. it is not recording in advance of loss.
High Beneficial	Elements of the asset's physical fabric which would otherwise be lost, severely compromising its cultural significance, are preserved *in situ*; or Elements of the asset's setting, which were previously lost or unintelligible, are restored, greatly enhancing its cultural significance.
No impact	No change to the asset's fabric or setting which affects its cultural significance.

67. The *likely significant effect* is the measure that brings together the magnitude of the impact and the cultural heritage asset's importance to assess the degree to which any change would impact on cultural significance. This measure is indicative of the weight that should be given to the matter in influencing the design of the proposal or, ultimately, in influencing whether the proposal will be acceptable and permitted.

68. For the purposes of relating the EIA assessment to the vocabulary used in NPS EN-1 and NPPF (i.e. 'substantial' and 'less than substantial' harm):

- Adverse impacts of high magnitude are equivalent to substantial harm
- Adverse impacts of medium and low magnitude are the equivalent to 'less than substantial harm' but on the higher and lower end of the scale respectively
- Impacts of negligible magnitude describe a 'discernible change' but one that does not result in loss of significance.

22.4.3.1 Significance of Effect

69. The assessment of significance of an effect is informed by the sensitivity of the receptor (**Table 22-7**) and the magnitude of the impact (see **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** for further detail). The determination of significance is guided by the use of an Onshore Archaeology and Cultural Heritage significance of effect matrix, as shown in **Table 22-9**. Definitions of each level of significance of effect are provided in **Table 22-10**. For the purposes of this assessment, any effect that is of major or moderate significance is considered to be significant in EIA terms, whether this be adverse or beneficial. Any effect that has a significance of minor or negligible is not significant.

Table 22-9 Significance of Effect Matrix

		Adverse Magnitude				Beneficial Magnitude			
		High	**Medium**	**Low**	**Negligible**	**Negligible**	**Low**	**Medium**	**High**
Importance	High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 22-10 Definition of Effect Significance

Significance	Definition
Major	Changes in cultural significance, either adverse or beneficial, which are likely to be important considerations at a national or regional level because they contribute to achieving national or regional objectives. Effective/acceptable mitigation options may still be possible, to offset and/or reduce residual impacts to satisfactory levels.
Moderate	Changes in cultural significance, either adverse or beneficial, which are likely to be important considerations at a local level. Effective/acceptable mitigation options may still be possible, to offset and/or reduce residual impacts to satisfactory levels.
Minor	Changes in cultural significance, either adverse or beneficial, which may be raised as local issues but are unlikely to be material considerations in the decision-making process. Industry standard mitigation measures may still apply.
Negligible	No material change to cultural significance.
No change	No impact, therefore, no change to cultural significance.

22.4.4 Historic Landscape Character

70. The approach to the assessment of Historic Landscape Character (HLC) differs to that outlined above for heritage assets.

71. The historic character of the landscape is described in terms of ability to accommodate change. For this reason, an approach is required which recognises the dynamic nature of landscape and how all aspects of the landscape, no matter how modern or fragmentary, can form part of the character of that landscape.

72. It is not meaningful, therefore, to assign a level of importance to these aspects of landscape character. Individual elements which contribute towards the HLC of an area (e.g. hedgerows, field boundaries) may, however, be assigned a heritage importance based on the criteria outlined in **Table 22-7** (where relevant).

73. As the HLC is described in terms of ability to accommodate change, it is also not meaningful to assign a measure of magnitude in order to understand the nature of the potential changes. Rather, this change is expressed as a narrative description of the landscape character and how it might be affected by the Projects.

74. Regarding the HLC, in terms of assessing the effect, it is the alteration arising from the Projects to the baseline HLC as assessed in this chapter (see section 22.5.13 and **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**) that is the key focus. In the absence of attributing heritage importance, effects upon the HLC cannot be assessed using the significance matrix presented in **Table 22-9**, but is rather expressed in terms of the ability of the HLC to accommodate any change arising from the Projects.

75. In this respect, while damage to, or destruction of, a heritage asset is considered permanent and irreversible, effects to HLC are dynamic, and may be temporary and reversible. Certain elements/features that may be considered to contribute to the HLC of an area (e.g. hedgerows, field/parish boundaries) may nonetheless be considered in relation to the process outlined above, as and where relevant.

22.4.5 Cumulative Effect Assessment Methodology

76. Cumulative effects can be defined as:

- effects upon a single receptor to arise as a result of impact interaction between different environmental topics from the Projects; and
- incremental effects on that same receptor from other proposed and reasonably foreseeable projects and developments in combination with the Projects. This includes all projects that result in a comparative effect that is not intrinsically considered as part of the existing environment and is not limited to offshore wind projects.

77. The overarching method followed in identifying and assessing potential cumulative effects in relation to the onshore environment is set out in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)**, section 6.7.4. The approach is based upon the Planning Inspectorate (PINS) Advice Note 17: Cumulative Effects Assessment (PINS 2019).

78. The CEA followed a four-stage approach developed from Advice Note 17. These stages are set out in **Table 6-10** of **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)**.

22.4.6 Transboundary Effects Assessment Methodology

79. There are no transboundary effects anticipated resulting from the Projects with respect to Onshore Archaeology and Cultural Heritage.

22.4.7 Assumptions and Limitations

80. Data used to compile the ES chapter primarily consist of secondary information derived from a variety of sources. The assumption is made that the secondary data, as well as those derived from other secondary sources, are reasonably accurate.

81. The records held by the sources used in this assessment are not a record of all surviving heritage assets, rather a record of the discovery of a range of archaeological and historical components of the historic environment for the study areas. The information held within these sources is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown.

82. To address this uncertainty, archaeological fieldwork has been undertaken to allow the inferences drawn from desk-based information to be tested. This work has broadly confirmed those conclusions, although some areas of previously unrecorded archaeological remains have been identified and may yet be present in areas which have not been surveyed. The implications of this work are discussed in the impact assessment set out at section 22.6.

22.5 Existing Environment

22.5.1 Introduction

83. The following section provides a summary of the known and potential onshore archaeological and cultural heritage resource within the defined study areas.

84. The baseline environment as presented below has been, to date, informed by the baseline data and information gathering exercise and assessment undertaken as part of the ADBA (**Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**) and the Aerial Photographic, LiDAR and Map Regression Analysis (**Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**).

85. Site visits have been undertaken to inform the initial heritage setting assessment exercise and establish the condition of extant historic earthworks and structures (**Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)** and **Volume 7, Appendix 22-4 Heritage Walkover Survey Report (application ref: 7.22.22.4)**). In addition, a Geoarchaeological DBA (**Volume 7, Appendix 22-6 Geoarchaeological Desk based Assessment (application ref: 7.22.22.6)**) and the results of the Geophysical Survey (**Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**) and archaeological trial trenching (**Volume 7, Appendix 22-8 Interim Archaeological Evaluation Report (application ref: 7.22.22.8)**) also inform this baseline section.

86. The archaeological periods referred to in this chapter are broadly defined by the following date ranges:

- Palaeolithic: 960,000 BP – 8,500 BC;
- Mesolithic: 8,500 – 4,000 BC;
- Neolithic: 4,000 – 2,200 BC;
- Bronze Age: 2,200 – 700 BC;
- Iron Age: 700 BC – AD 43;
- Romano-British: AD 43 – 410;
- Early medieval: AD 410 – 1066;
- Medieval: AD 1066 – 1499;
- Post-medieval: AD 1500 – 1899; and
- Modern: AD 1900 – present day.

22.5.2 Designated Heritage Assets

87. There are 602 designated heritage assets within the Designated Heritage Assets Study Area:

- 32 scheduled monuments;
- 557 listed buildings;
- Two registered parks and gardens; and
- 11 conservation areas.

88. All designated heritage assets have been compiled into a gazetteer (**Annex 22.2.1** of **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**) and are presented on **Figures 22-2-2a-c** of **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**.

89. There are no designated heritage assets located within the Onshore Development Area.

22.5.2.1 Heritage Importance

90. Based on the criteria in **Table 22-7**, the designated heritage assets outlined in section 22.6 are considered to be assets of medium or high heritage importance with perceived regional or national importance (**Annex 22.2.1** of **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**).

22.5.3 Non-Designated Heritage Assets

91. The details of the historic environment baseline for the Projects have been summarised below from the ADBA (**Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**). The ADBA has been updated to reflect the refinement of the ES Onshore Development Area following PEIR.

92. All Humber HER data has been compiled into a gazetteer (see **Annex 22-2-2** and **Figure 22-2-3a-l** of **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**). The sub-sections below identify the known remains most relevant to the study area based on the Onshore Development Area with additional information provided where available. This comes from archaeological reports, HER event record data, data held on the ADS and the National Mapping Programme.

93. A review was undertaken of Coastal and Intertidal Zone Archaeological Network data (CITiZAN) at landfall and the associated access road. This did not, however, identify any additional records not covered in the HER.

94. There are 316 Historic Environment Record entries within the Non-Designated Heritage Assets Study Area. These are summarised as:

- 12 Prehistoric (undefined);
- Two Palaeolithic;
- Two Mesolithic;
- Seven Neolithic;
- Nine Bronze Age;
- 14 Iron Age;

- 12 Roman;
- 45 Medieval;
- 97 Post Medieval;
- 65 Modern; and
- 51 Undated.

95. Of these records, 26 are located within the Onshore Development Area. Non-designated heritage assets potentially subject to direct physical impacts are confined to the Onshore Development Area. These may comprise potential subsurface archaeological remains and above ground heritage assets (e.g. earthworks or structures).

96. Non-designated heritage assets which may be subject to indirect physical or non-physical impacts (associated with change in setting) as a result of the Projects may be either within or beyond the parameters of the Onshore Development Area.

22.5.3.1 Palaeolithic

97. Within the non-designated heritage assets study area there are two Palaeolithic records comprising a findspot and a monument; Palaeolithic flint (17601) was recorded c.22km northwest of the Onshore Development Area, and parallel ditches, west of Meaux Lane (MHU15410) were recorded c.200m southeast of the Onshore Development Area.

22.5.3.2 Mesolithic

98. There are no Mesolithic records within the non-designated assets study area. The site of Withow Mere (8835) containing finds of Mesolithic and later date is located c. 480m to the south of the Onshore Development Area. The mere has been largely eroded by the sea during the post-medieval period, except for the west end and part of the lakebed. This is now on the foreshore and occasionally exposed. It is also designated as a Site of Special Scientific Interest (SSSI).

22.5.3.3 Neolithic

99. Within the non-designated heritage assets study area there are seven Neolithic records of which none are located within the Onshore Development Area. The assets in closest proximity to the Onshore Development Area are 20109, 6625 and 8435.

100. Record 6625 comprises the site of a possible henge, not visible on any aerial photographs. It is located to the south of Beverley c. 180m to the north of the Onshore Development Area. A Neolithic axehead (20109) which is now on display in Hull Museum was also found 150m to the south of the Onshore Development Area approximately 900m south of the possible henge (6625).

101. A Neolithic flint axe (8435) was identified east of Eske Manor. It was found immediately adjacent (c. 5m) to the Onshore Export Cable Corridor.

102. The remaining records comprise earthworks and flint artefacts.

22.5.3.4 Bronze Age

103. There are nine Bronze Age records within non-designated heritage assets study area, none of which are located within the Onshore Development Area. The closest records to the Onshore Development Area include record 4409, a Bronze spearhead, found adjacent to the access track on Ulrome Beach, and record 16379, Bronze Age animal horns found c.5m to the south of landfall.

104. The remaining records comprise earthworks largely visible as cropmarks and chance finds such as axeheads and spearheads.

22.5.3.5 Iron Age

105. Within the non-designated heritage assets study area there are 14 Iron Age records, one of which is located within the Onshore Development Area:

- HER record 7169 comprises enclosures and trackways within the Onshore Development Area. Aerial photographs show double linear features with possible small enclosures at centre of complex.

106. The remaining assets closest to the Onshore Development area are 3591, 22161, 18396, 15807 and 13459.

107. 3591 is the site of a large polygonal enclosure with an associated irregular field system fragment located c. 25m to the southeast of the Onshore Export Cable Corridor at Riston Carr.

108. 22161 is the site of an Iron Age to Romano British field system adjacent to Dunnington Lane access trackway.

109. Three records 18396, 15807 and 13459 are adjacent to the emergency beach access track north of the landfall zone.

110. The remaining records largely comprise earthworks primarily visible as cropmarks on aerial photographs.

22.5.3.6 Prehistoric (undefined)

111. Within the non-designated heritage assets study area there are 12 Prehistoric records, one of which is located within the Onshore Development Area.

112. Record 7169 describes an area of Iron Age to Romano-British enclosures and trackways at Catwick visible on aerial photography.

113. The remaining records largely comprise prehistoric artefacts identified as findspots and earthworks located outside the Onshore Development Area.

22.5.3.7 Roman

114. Within the non-designated heritage assets study area there are 11 Roman records, all of which are located outside the Onshore Development Area. These largely comprise finds of coins, pottery and several ditched enclosures.

22.5.3.8 Medieval

115. Within the non-designated heritage assets study area there are 45 medieval records, of these only one is located within the Onshore Development Area which is outlined below.

116. Record 21207 comprises ridge-and-furrow visible as earthworks and cropmarks on aerial photographs east and northeast of Skipsea village. Nearly all the earthworks appear as cropmarks or to be no longer extant on the 1992 OS vertical photography. Similar earthworks and cropmarks (21219) are visible on aerial photography southeast of Skipsea. These were not visible in 2009 so are presumed to have been ploughed out.

117. The remaining Humber HER records outside the Onshore Development Area but within the study area largely comprise moated sites, DMVs, chance finds of coins, seal matrices, pottery brooches, ring etc. There are also several records pertaining to churches, trackways and earthworks.

22.5.3.9 Post-Medieval

118. Within the non-designated heritage assets study area there are 97 post-medieval records of which six are located within the Onshore Development Area. They comprise:

- 13025 – the site of a shepherd hut, near Bentley;
- 13026 – a well, northwest of the Shepherd Hut, near Bentley;
- 13031 – milestone on York Road;
- 13102 – South Bullock pumping station;
- 13104 – site of saltings at Eske; and

- 13271 – old course of Holderness drain.

119. The majority of the records located outside the Onshore Development Area relate to historic buildings or structures, such as farmsteads, windmills, watermills, public houses, blacksmiths, previous toll roads or turnpikes.

22.5.3.10 Modern

120. There are 57 modern records within the non-designated heritage assets study area of which twelve are located within the Onshore Development Area. These are:

- 18422 – WWII pillbox recorded within the southern Landfall Zone;
- 18424 – site of WWII decoy, east of Dunnington Lane within the Onshore Export Cable Corridor;
- 18425 – site of WWII decoy, west of Routh within the Onshore Export Cable Corridor;
- 18429 – WWII pillbox recorded within the northern Landfall Zone;
- 21208 – four WWII bomb craters recorded within the northern landfall;
- 21215 – WWII military coastal defences in the form of barbed wire obstructions, minefield, aircraft obstruction and weapons pits recorded within the southern Landfall Zone;
- 21240 – a square pillbox constructed on the line of a field boundary ditch to the east of two earlier weapons pits recorded within the southern Landfall Zone;
- 9990 – WWII pillbox, surrounding barbed wire obstruction, a trackway, a trench, two potential weapons pits and bomb craters are recorded within the northern Landfall Zone;
- 9991 – Upstanding remains of WWII pillbox, east of Skipsea village;
- 9992 – WWII lozenge-shaped pillbox with rear blast wall recorded within the northern Landfall Zone;
- MHU21210 – WWII Diver AA battery located immediately east of Southfield House, replacing an earlier pillbox, is recorded within the Onshore Export Cable Corridor; and
- MHU15288 – WWII Heavy anti-aircraft gunsite.

121. The remaining records largely comprise military installations such as pillboxes and bunkers.

22.5.3.11 Undated

122. There are 51 undated records within the non-designated heritage assets study area, of which seven are located within the Onshore Development Area. These include:

- Possible enclosure (10203) visible as a vague cropmark of square feature and possible ridge and furrow;
- HER records 21231 and 21232 comprise a ditch and a large pit seen in the cliff section at Skipsea;
- A possible linear cropmark (19463) is visible on aerial photography to the northeast of Catfoss Grange;
- Several ditches (19050) located north of Meaux Lane;
- HER record 3530 comprises rectangular enclosures and fields; and
- Aerial photography shows cropmarks of a linear bank and ditch (MHU596), possibly a dyke at Killingwoldgraves.

123. The remaining records are located outside of the Onshore Development Area and largely comprise undated earthworks and cropmarks.

22.5.3.12 Previous Archaeological Investigations

124. The Humber HER records several archaeological investigations have taken place within the non-designated heritage assets study area, some of which are already detailed above under each relevant period; therefore, this section provides a brief summary of the nature and type of assessments/surveys undertaken which have informed the known archaeological record and enhanced our understanding of the historic environment in this area.

125. Archaeological monitoring (EHU1975) was undertaken during the topsoil strip of the Keldgate to Beverley water pipeline, which crosses the Onshore Development Area. Extant ridge and furrow was identified, possibly belonging to the open field system of Bentley medieval village. An earlier alignment of Coppleflat Lane was identified along with 40 tree boles associated with the clearance of Bentley Moor Wood, 30 years earlier. An area of burnt deposits was identified along with a modern pit. Environmental samples from these two features identified burnt oak and may relate to the clearance of the woodland. A series of flints including a Bronze Age core and scraper, were recovered from the topsoil along with Medieval to Post Medieval pottery.

126. A geophysical survey (EHU3317) was undertaken on land to the south of Minster Way, Beverley, prior to proposed development. The survey showed several linear anomalies and an area of disturbance, west of the Beverley Growth Pipeline Scheme. These were identified as possibly relating to a drainage system recorded on the 1855 First Edition Ordnance Survey. One alignment was of regularly spaced anomalies and may indicate ridge and furrow. This was located to the east of the Onshore Substation Zone.

127. An archaeological and condition survey (EHU2515) was undertaken at the Anti-Aircraft gunsite 350m west of Butt Farm (SM 1019186) near Walkington.

128. A geophysical survey (EHU658) was undertaken on the site of Nunkeeling Priory in advance of a proposed dwelling, c.25m southwest of the Onshore Development Area. Two areas were surveyed using both resistance and magnetic techniques, Areas A and B. The resistance survey in Area A produced a discrete area of high resistance, which may represent foundations associated with a building. There was also a suggestion of a linear high resistance response. No anomalies of archaeological potential were located by the resistance survey in Area B.

129. A watching brief (EHU335) was subsequently undertaken during the groundwork for the construction of a single dwelling on Area B, c.25m west of the Onshore Development Area. The site of the development lies close to the site of the priory founded by the Benedictine Nuns in 1152 AD. No archaeological features were identified, and no finds recovered.

130. Geophysical survey (EHU2664) was undertaken on land at Pastureland House, Bewholme, approximately 40m west of the Onshore Export Cable Corridor. The results revealed several anomalies of potential archaeological interest, comprising six pit-like features and several linear features that may represent field boundary ditches and modern drains.

131. The remaining event records are summarised in **Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**.

132. Recent archaeological work relating to the onshore elements of Hornsea Project Four and Dogger Bank A & B (Forewind 2014) have further characterised the archaeological resource in East Yorkshire through desk-based research, and archaeological fieldwork (Orsted 2021).

22.5.4 APS Assessment of Aerial Imagery

133. The assessment of aerial imagery undertaken by APS has identified 101 areas of archaeological interest within the Onshore Development Area. Below is a summary of the assessment which identifies the extent of cropmark features identified from aerial imagery. Full details of the assessment and descriptions of the findings are provided in **Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**.

134. Additional assessment was undertaken by APS in August 2023 following the diversion routes at Nunkeeling and Long Riston. This identified a further 10 areas of archaeological interest within the Onshore Development Area. Full details of the assessment and descriptions of the findings are provided in **Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**.

135. The aim of the assessment was to provide information on the location and nature of buried and upstanding archaeological features. Historic aerial photographs, modern aerial and satellite imagery and visualised ALS, also known as LiDAR, was used to assess the topographic and micro-topographic features within the Onshore Development Area, alongside historic map regression analysis.

136. Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils.

137. It is likely that the below-ground archaeological deposits which cause the marks in crops and grass in this area are more extensive, both horizontally and vertically, than shown via the aerial imagery. Absence of cropmark evidence does not necessarily indicate an absence of archaeological deposits in apparently blank areas.

138. Features dating to the prehistoric, Roman, Medieval, Post Medieval and Modern periods have been identified and mapped. Some of these features have been previously identified by the Humber HER and Humber NMP survey.

139. The separation of dating into specific periods of prehistory and history can only be confirmed by ground-based or documentary analyses, but some dating evidence for sites within the APS Site has been proposed by the Humber HER and NMP and by observation of morphological characteristics of cropmarked sites.

140. From an aerial perspective, this landscape may be analysed in a 'living' manner as one which developed over time and contains many multi-period elements. These will be more deeply stratified and extensive below the ground than is apparent in the results of the survey. The remains visible as cropmarks are all likely to have been impacted by agricultural cultivation, to some degree, and retain minimal or no micro-topographic features visible on the ground surface.

141. The extensive WWII defensive features have been greatly reduced by their dismantlement and by marine erosion, but some of the concrete structures are still in place.

22.5.5 Heritage Walkover Survey

142. The heritage assets visited as part of the walkover surveys included areas of potential earthworks and structures at the landfall, areas of potential earthworks and structures along the Onshore Export Cable Corridor and areas of potential earthworks and structures located within and near to the Onshore Substation Zone.

143. The heritage walkover survey confirmed the presence of two pillboxes within the landfall and intertidal zone (9992 and 9991) which survive in good condition. Of the areas visited, the majority did not contain extant historic earthworks or structures as identified on the Humber HER. This was due to either coastal erosion at the landfall or farming practices, such as ploughing, inland.

144. In the areas where earthworks survive as above ground heritage assets, it was noted that the majority of the earthworks were only visible as slight undulations within the landscape and were not particularly definitive as archaeological features (19463).

22.5.6 Archaeological Geophysical Survey

145. The following is a summary of the archaeological geophysical survey results recorded within the Onshore Development Area only up to January 2024 (**Volume 7, Figure 22-4a-h (application ref: 7.22.1)**). The summary includes the full or partial coverage of 10 Priority Areas (Pas). Full interpretations of the geophysical survey results including areas no longer within the Onshore Development Area are provided in **Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**.

146. Within the landfall area (which partially falls within PA1) a probable rectilinear enclosure has been recorded in the northwest of the area. A series of curvilinear trends are observable in the southeast which have the appearance of a trackway. Parallel trends indicative of extensive ridge and furrow cultivation have been detected across most of the survey areas. Several discrete areas of strongly enhanced magnetic response have been recorded which corresponds with HER entries for WW2 pillboxes, trackway, and gun emplacement. The results of the survey indicate that the technique is responding very well to the geological conditions and the expected archaeology.

147. Within PA3 (Onshore Export Cable Corridor) a possible rectilinear anomaly complete only on three sides has been detected to the south of the study area. The extent of a second possible rectilinear enclosure has been detected in Field 11, which partially falls within the Onshore Development Area.

148. A concentration of linear anomalies have been detected within Field 54. Although fragmentary it is possible that these may form an enclosed settlement.

149. At the Nunkeeling diversion, two parallel linear anomalies have been identified extending for c. 50m. They may be associated with a possible Roman road running between Bridlington and Hull which is visible as a soil mark (MHU1007) recorded 200m to the southwest. However, based on their location and alignment, it is more likely that they are associated with the former airfield (APS_105).

150. Within PA11 to the west of Sigglesthorne, a series of linear trends and possible rectilinear and circular anomalies have been recorded which have been interpreted as enclosures abutting a trackway. An additional positive trend which resembles a rectangular structure, correlates well with the known location of a windmill.

151. To the north of this within Field 176, a fragmentary linear trend has been identified which has been interpreted as possible archaeology due to its clear definition. It is possible that the anomalies area associated with a medieval ditch earthwork recorded on NMP mapping to the south (HE UID_1460528).

152. A strong, well-defined set of linear trends have been detected within Field 1235. These form a square enclosure with the suggestion of a southern extension. The strong ridge and furrow responses in the area suggest that the enclosure predates this medieval cultivation.

153. To the northwest of Long Riston which partially falls within PA13, several anomalies of possible and probable archaeological origin have been identified in Field 221. These include linear anomalies forming a partial enclosure; two short parallel linear trends; and a linear spread situated slightly to the east of the position of a possible Iron Age / Roman ditch recorded on NMP mapping. The results of the geophysical survey corroborate with features mapped on the NMP (HE UID_1460420) and recorded in the HER (MHU7169).

154. A concentration of linear and curvilinear trends have been interpreted as probable/definite archaeology in Field 1192. The form of the responses suggests a possible Iron Age settlement with associated enclosures and possible trackways. The HER record lists a possible enclosure at this location recorded as a poorly defined cropmark (MHU10203). Further east, three clusters of fragmentary responses have been recorded in this survey area. They have a possible archaeological origin due to their nature and form, potentially indicating plough damaged prehistoric enclosures.

155. In Field 1255, a well-defined linear trend has been detected which appears to be a continuation of an Iron Age / Roman ditch visible as a cropmark (HE UID_1334599). The further continuation of this ditch may have been identified in Field 1257 to the west and again in Field 1252. Two additional parallel linear trends may be comparable to the Prehistoric / Roman trackway (HE UID_1463587) recorded as a cropmark 280m to the southwest.

156. Within Field 334 a series of positively enhanced trends have been detected. Although largely unconnected in form, they do form a loose pattern that could potentially suggest an unenclosed settlement interspersed among the more natural trends in the vicinity.

157. To the northeast of Beverley within PA15 and PA16, a series of linear and curvilinear trends of were identified. The nature and form of these anomalies suggest an archaeological origin, however, they may be related to agriculture. Two curvilinear anomalies were detected in Field 301 which likely continue eastward and may form enclosures.

158. Within PA17, to the northwest of Beverley, the survey area is dominated by ridge and furrow. In the northwest and southwest of the Priority Area, linear trends have been detected which appear to form part of a possible prehistoric field system. They are categorised as having a probable archaeological origin due to their character and form. Although, no known sites or cropmarks have been recorded within this area, Roman/Iron Age cropmarks have been recorded 250m to the southwest.

159. To the southwest of Beverley, within PA18, a large number of fragmentary anomalies in the south of the study area have been interpreted as possible archaeology.

160. Within Field 1251 a well-defined circular anomaly measuring 7m in diameter has been detected. Although the shape and size of the anomaly is consistent with a ring ditch/barrow the strength of the response does not support such an interpretation. One possibility is it could indicate the base of a limekiln. Limekilns are noted in wider landscape on the 1st edition OS map and such activity would also explain the elevated level of background response.

161. At the Onshore Substation Zone, within PA24, a very well-defined circular anomaly of possible archaeological origin has been detected in the southeast of the survey area, measuring approximately 30m in diameter. It appears to be associated with an extant feature and an area of likely modern disturbance which might suggest a more recent origin, potentially associated with WWII infrastructure.

22.5.7 Archaeological Trial Trenching

162. A programme of archaeological trial trenching (Phase 1) was undertaken between August to December 2023 at the Landfall Zone and Onshore Substation Zone. The findings of which are summarised below and detailed within an interim archaeological evaluation report in **Volume 7, Appendix 22-8 Interim Archaeological Evaluation Report (application ref: 7.22.22.8)**.

163. The phase 1 trenching initially comprised 59 trenches at landfall and 82 trenches at the Onshore Substation Zone (**Figures 3 and 4A** in **Volume 7, Appendix 22-8 (application ref: 7.22.22.8)**). During the trenching persistent heavy rain led to concerns being raised by landowners about ground conditions and damage to land parcels. As such, and with the agreement of the Humber Archaeological Partnership (HAP), specialist archaeological advisors to East Riding of Yorkshire Council, trenching at the substation site was postponed after the excavation of 49 trenches. Similar issues affected the trenching at the Landfall Zone and given the worsening weather towards the end of the fieldwork programme, HAP agreed to a proposal to descope two trenches to facilitate the completion of the works.

22.5.7.1 Landfall

164. In general, some level of archaeological activity was encountered across the Landfall Zone, with notable concentrations of more significant activity suggestive of settlement in two key zones in the northwest and southeast.

165. The highest concentration of archaeological features at the landfall were located close to the northwest corner where a cluster of highly productive medieval features were located immediately to the south of an extant field boundary ditch. The archaeological features represent medieval settlement over more than one phase of activity and consist of large boundary ditches, smaller ditches probably functioning as field or plot divisions, several curvilinear gullies and a posthole which may indicate structural remains, and pits of varying sizes. The quantity of finds in these trenches indicates that the activity is highly likely to have been within (rather than simply close to) settlement. The character of the finds appears to be domestic, with no obvious signs of industrial activity, and probably represents domestic waste discarded in features close to contemporary settlement.

166. This activity corresponds to an area of strong geophysical trends and the combination of the geophysical results alongside the trenching results suggests a rectilinear enclosure surrounding sub-divided land parcels. Ditches are generally slightly off east-west or north-south alignments, in line with the ridge and furrow trends in this part of the Landfall Zone. Documentary research undertaken by HAP suggests that this is highly likely to be the location of the 'lost' medieval hamlet of Cleeton (pers. Comm. Richard Newman, Principal Archaeologist, HAP).

167. In the southeast corner of the Landfall Zone a double-ditched trackway along with settlement environs of probable Iron Age to Roman activity was located. It appears that concentrated settlement activity was confined to the southeast corner of the landfall zone, the trackway further west perhaps marking a route linking the settlement with field systems and potentially other settlements in the surrounding landscape. The possible trackway was traced westwards. The area along this linear trend, and to either side of it, can be considered likely to produce further evidence of Iron age/Roman field systems with possible associated activity.

168. Outside the key areas of activity features of undated and Iron Age/ Roman date were identified in the north, northeast and northwest of the Landfall Zone.

169. A small number of features were encountered in the northwest corner of the Landfall Zone which had blackened fills containing fired stones, indicative of burning activity.

170. A concentration of ditches in the northwest corner of the Landfall Zone, some of which contained struck flints or handmade pottery, indicates a further zone of possible Iron Age activity.

171. The central area of the landfall contained undated archaeological features situated in a low point in the landscape, was characterized by dense sandy clays. Palaeochannel or pond deposits were recorded at the north end of Trench 38 indicating that this location has been a wet environment prone to flooding for a long time. A small number of discrete pits were excavated in this area, along with a possible linear ditch terminus. Within the southwest corner of landfall zone a low concentration of undated and post-medieval archaeological features comprising pits and ditches were identified.

22.5.7.2 Substation

172. The evaluation within the Onshore Substation Zone demonstrated that significant archaeological features generally survived in the low-lying region (now outside the Onshore Development Area), rather than on the higher ground (where one would typically expect settlement activity). The lower incidence of archaeological features on the higher ground may be due to differential truncation of deposits. In the southeast corner of the Onshore Substation Zone where archaeological preservation was good, the archaeological features were sealed by colluvial and subsoil deposits which provided a degree of protection from plough truncation. To the north on the higher ground, these sealing deposits were not present, and any potential archaeological features would have been subject to much greater attrition

through ploughing, potentially removing some entirely (the natural geology on the northern parts of the site showed evidence of heavy ploughing).

173. A focus of archaeological activity lay in the southeast corner of the site (Trenches 81-91). The geophysical survey results indicated potential rectilinear enclosures defined by north-south aligned ditches running along either side of an east-west aligned ditched trackway or settlement boundary. For the most part, the features recorded in this area during the evaluation accorded with the results of the geophysical survey. This area is no longer within the Onshore Development Area.

174. Dispersed features were located across the remainder of the Onshore Substation Zone including and undated pit, several post-medieval field boundaries and small pits and a ditch which produced a single fragment of likely Iron Age or Romano-British pottery.

22.5.8 Potential Sub-surface Archaeological Remains

175. Heritage assets located within or partly within the Onshore Development Area that are considered to potentially represent surviving below ground archaeological remains have not yet been fully evaluated through non-intrusive and intrusive (e.g. geophysical survey and trial trenching) evaluation approaches.

176. A summary of the sub-surface archaeological remains identified within the Onshore Development Area from the desk-based and non-intrusive surveys (completed as of November 2023) is presented in **Table 22-11** and shown in **Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**.

Table 22-11 Summary of Potential Archaeological Remains Identified to Date

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
Emergency access route to the intertidal area				
MHU21180	N/A	N/A	WWII military building visible on Aerial Photographs (Aps). Confirmed destroyed by 2009.	Negligible as no longer extant
MHU21189	APS_081	N/A	WWII pillbox and surrounding barbed wire obstructions visible on Aerial Photographs (Aps). Confirmed destroyed in 2009.	Negligible as no longer extant
MHU21196	N/A	N/A	WWII pillbox visible on Aerial Photographs (Aps). Confirmed destroyed in 2009.	Negligible as no longer extant
N/A	APS_079	N/A	A defensive site built over and lost to coastal erosion.	Negligible as no longer extant.
Landfall Zone				
MHU21209	N/A	N/A	WWII observation post with loopholes on cliff edge, east of Skipsea. Still visible on the beach in 2009, but in poor condition. Not visible in walkover survey	Negligible as no longer extant
MHU18429	N/A	N/A	WWII pillbox visible on Aerial Photographs (Aps). Now on the beach in poor condition in 2009.	Negligible as no longer extant
MHU21232	N/A	N/A	Possible large pit in cliff section. Fill cut by modern field drain.	Negligible as no longer extant
MHU21245	N/A	N/A	WWII concrete posts, probably anti-aircraft landing obstacles.	Negligible as no longer extant
MHU21246	N/A	N/A	Remains of WWII pillbox.	Negligible as no longer extant
MHU21231	N/A	N/A	Ditch approximately 1m wide seen in cliff section. Grey fill containing some gravel.	Low
MHU9991	APS_088	N/A	Upstanding remains of a WWII pillbox.	Low to medium
MHU9992	N/A	N/A	WWII pillbox visible on Aerial Photographs (Aps), now situated in the centre of a field.	Medium
MHU21208	APS_084	1141A, 1144A	Four WWII bomb craters visible as a row of earthworks on an east to west alignment on Aps. Not visible in 2009 and now infilled and not visible via visualised LiDAR data.	Low
MHU21207	APS_080	N/A	Medieval/post-medieval ridge and furrow visible as earthworks and cropmarks on Aps east and north-east of Skipsea village. Nearly all of this appears as cropmarks or to be no longer extant on the latest 1992 OS vertical photography. Mostly not visible in 2009.	Low

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	1145A, 1145B, 1145C, 1145D, 1145E	The trial trenching evaluation revealed a high concentration of archaeological features in the northwest corner of the site, including large and small boundary ditches, pits and post-holes, representing multiple phases of medieval settlement activity in this area. These features corroborated with the results of the geophysical survey. Finds of pottery and mixed medieval fabrics were among the most common finds type across the settlement, the character of which appears to be domestic, with no obvious signs of industrial activity.	High
N/A	N/A	1145F	The trial trenching evaluation identified a spread of cobble stones resembling a dump of hard material to consolidate the ground. The cobbles appeared to have been imported and dumped within a sandy matrix and were most likely deposited in the post-medieval period.	Low to medium
N/A	N/A	1144B	The trial trenching evaluation identified paleochannel or pond deposits within Trenches 37 and 38 suggesting this location has been prone to flooding for an extended period. A small number of discrete pits were excavated and a possible ditch terminus in Trench 37, all containing natural sterile deposits.	Low
N/A	N/A	1312A, 1312B, 1312C, 1312D, 1312E, 1312F	The trial trenching evaluation revealed a double-ditched trackway corroborating with the geophysical survey results (1312A). The area immediately surrounding the trackway ditches contained a significant concentration of features and high incidence of finds, indicating that this part of the site is likely to be close to settlement activity possibly extending into the site. Finds and stratigraphy in this area suggest probable Iron Age to Roman activity.	Medium to high
N/A	N/A	1141B, 1141C	The trial trenching evaluation revealed an area of undated and Iron Age/Roman activity in the north and northwest edge of the site. A substantial ditch was identified which corroborated with the results of the geophysical survey (1141B). Further west, many sherds of handmade pottery of probable Iron Age date were recovered from a feature in Trench 57. Several struck flints were also recovered from this region indicating a possible prehistoric date.	Medium to high
Onshore Export Cable Corridor				
N/A	N/A	11A	The geophysical survey identified a series of abutting enclosures (11A) which were interpreted to be probable archaeology, which partially lies within the Onshore Development Area.	Low
N/A	N/A	35D, 35F	The geophysical survey identified a poorly defined rectilinear anomaly (35D) and a linear trend (35F) which have been interpreted as possible archaeology, though its obscurities could suggest a natural origin.	Low to medium

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	35E	The geophysical survey identified a series of rectilinear anomalies (35E) which marginally extend into the Onshore Cable Route and have been interpreted as possible archaeology.	Low
N/A	APS_078	N/A	Footpath visible as a cropmark on aerial imagery sources.	Low
N/A	APS_077	N/A	An area of eroded Medieval / Post Medieval Ridge and Furrow is visible as microtopography via LiDAR data sources.	Low
N/A	N/A	54C	The geophysical survey identified a concentration of fragmentary linear anomalies (54C) that have been interpreted as possible archaeology. The anomalies may represent an enclosed settlement.	Low to medium
N/A	APS_076	N/A	An area of eroded Medieval / Post Medieval ridge and furrow is visible as a cropmark on aerial imagery sources. Also identified during the geophysical survey.	Low
N/A	APS_075	N/A	Field boundary visible as a cropmark on aerial imagery sources.	Low
N/A	APS_074	N/A	An area of eroded Medieval / Post Medieval ridge and furrow which is no longer visible as an earthwork on aerial imagery sources.	Low
N/A	APS_072	N/A	An area of eroded Medieval / Post Medieval ridge and furrow is visible on aerial imagery sources.	Low
N/A	APS_073	N/A	Cropmarks and residual microtopographic earthworks of Medieval / Post Medieval ridge and furrow.	Low to medium
N/A	N/A	185A, 185B, 185C, 185D	The geophysical survey identified a series of linear trends (185A) which have been interpreted as possible archaeology. Possible rectilinear and circular anomalies (185B) are discernible within the postulate enclosures. A series of additional linear trends (185D) to the west of the enclosures are interpreted as having a possible spatial association with them. Further linear trends (185C) were identified and correlate to the location of a known windmill structure.	Low to medium
N/A	APS_071	N/A	An area of eroded Medieval / Post Medieval ridge and furrow and a former field boundary is visible as microtopography via LiDAR data sources.	Low
MHU19463	N/A	N/A	Linear cropmark northeast of Catfoss Grange.	Low
MHU13271	N/A	N/A	A ditch marking the former Old Course Of Holderness Drain.	Low

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	APS_068	N/A	An area of earthwork remains of eroded ridge and furrow and former field boundaries visible on Aerial Photographs (Aps).	Low
N/A	N/A	176A	The geophysical survey identified a fragmentary linear trend (176A) which has been interpreted as possible archaeology based on its form and clear definition.	Low to medium
N/A	APS_067	N/A	An area of eroded Medieval / Post Medieval ridge and furrow is visible as microtopography via LiDAR data sources.	Low
	APS_106	N/A	An area of Medieval / Post Medieval ridge and furrow.	Low
N/A	APS_107	1343A	An area of Medieval / Post Medieval ridge and furrow and former field boundary ditches aligned north to south / east to west, visible on aerial photography and within the geophysical survey results.	Low
N/A	APS_105	140cA	The geophysical survey identified two parallel linear anomalies which extend for c.50m. These have been interpreted as possible archaeology as they may be associated with a possible Roman road running between Bridlington and Hull which is visible as a soil-mark (MHU1007) recorded 200m to the southwest. Given the alignment however, it is more likely that they are associated with the former airfield (APS_105).	Low to medium
N/A	APS_065	N/A	An area of eroded Medieval / Post Medieval ridge and furrow is visible as a cropmark on aerial imagery sources.	Low
N/A	N/A	1235A	The geophysical survey identified a square anomaly (1235A) which has been interpreted as definite/probable archaeology. Strong ridge and furrow responses in the area suggest it predates this Medieval cultivation.	Low to medium
N/A	N/A	221A, 221B	The geophysical survey identified linear anomalies forming a partial enclosure, interpreted as probable archaeology. The anomalies corroborate with features mapped on the NMP described as a possible Iron Age or Roman rectilinear enclosure (HE UID_1460420).	Low to medium
MHU7169	N/A	221E	The geophysical survey identified two short parallel linear trends which appear to be a continuation of the cropmarks and residual microtopography of an Iron Age / Roman trackway identified on NMP mapping (HE UID_1460420).	Low to medium
N/A	N/A	221G	The geophysical survey identified a linear spread interpreted as possible archaeology, situated slightly to the east of the position of a possible Iron Age / Roman ditch recorded on NMP mapping (HE UID_1460420).	Low to medium

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	N/A	Cropmark of a circular ditch identified from NMP mapping (HE_UID 1460420). Not identified during the geophysical survey.	Low to medium
N/A	APS_062	N/A	A former field boundary dating to the Post Medieval period is visible as an earthwork on aerial imagery sources.	Low
N/A	APS_061	N/A	An area of eroded Medieval / Post Medieval ridge and furrow.	Low
N/A	APS_058	N/A	An area of eroded Medieval / Post Medieval ridge and furrow is visible as a cropmark on aerial imagery sources.	Low
N/A	N/A	1201C	The geophysical survey identified a series of irregular and fragmented anomalies (1201C) which have been interpreted as possible archaeology.	Low to medium
MHU10203	N/A	1192A	The geophysical survey identified a concentration of linear and curvilinear trends (1192A) which have been interpreted as a possible Iron Age settlement with associated enclosures and possible trackways. The HER lists a possible enclosure at this location recorded as a poorly defined cropmark (MHU10203).	Medium to high
N/A	N/A	1192E	Earthworks of a medieval tree enclosure is recorded on NMP mapping (HE UID_1460330).	Low
N/A	APS_057	N/A	A natural feature of uncertain date visible as an earthwork on aerial imagery sources (HE UID_80749).	Low to medium
MHU3591	N/A	N/A	A series of north to south aligned Medieval or Post Medieval field boundaries and uncertain ditches visible as cropmarks were identified on NMP mapping (HE UID_1463627).	Low
N/A	APS_055	N/A	Cropmarks of a Prehistoric / Roman trackway.	Low to medium
N/A	APS_056	1255C	Cropmarks of a ditch representing a former field division depicted on the 1st Ed OS map of 1888 (NLS, 2023) identified during the geophysical survey (1255C).	Low
N/A	N/A	1255A	The geophysical survey identified a well-defined linear trend (1255A) which appears to be a continuation of an Iron Age / Roman ditch visible as a cropmark (HE_UID 1334599).	Low to medium
N/A	N/A	1257A	The geophysical survey identified a linear trend (1257A) that has been interpreted as probable archaeology, appearing to represent a south-westward continuation of an Iron Age / Roman ditch visible as a cropmark (HE_UID 1334599) (1255A).	Low to medium

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	1252A	The geophysical survey identified a short linear trend (1252A) which has been interpreted as possible archaeology and may represent a continuation of presumed ditch (1257A).	Low to medium
N/A	N/A	1252C	The geophysical survey identified linear trends (1252C) interpreted as possible archaeology. Although this does not correspond with any recorded cropmark features it lies only 50m to the east of a Later Prehistoric / Roman Trackway albeit on a different alignment.	Low to medium
N/A	N/A	N/A	NMP mapping records an Iron Age / Roman double ditched trackway, with some elements surviving as slight earthworks (HE_UID 1463587).	Low to medium
MHU19050	N/A	N/A	Ditches north of Meaux Lane recorded in the HER.	Low
N/A	APS_053	N/A	Aerial photography sources and geophysical survey shows an area of Medieval / Post Medieval ridge and furrow and a former field boundary.	
N/A	N/A	334A	The geophysical survey identified a series of broad trends (334A), largely unconnected but forming a loose pattern that could potentially suggest an unenclosed settlement. It is possible that the anomalies have a natural origin.	Low to medium
N/A	N/A	315A	The geophysical survey identified a linear trend (315A) running through the centre of the survey area. This has been noted as having a possible archaeological origin due to its nature and form, but it may have an agricultural origin.	Low to medium
N/A	N/A	296A	The geophysical survey identified a circular trend (296A) which was noted as possible archaeology due to its form but may have a natural origin.	Low to medium
N/A	APS_051	N/A	Ditch visible as a cropmark on aerial imagery sources.	Low
MHU18425	N/A	N/A	Site of WWII decoy west of Routh.	Low
N/A	APS_049	N/A	Area of Medieval / Post Medieval ridge and furrow. The geophysical survey detected some unclear linear trends at this location.	Low
N/A	N/A	300A	The geophysical survey identified several linear trends [300A] and have been categorised as possible archaeology.	Low to medium
MHU13102	N/A	N/A	South Bullock Pumping Station.	Low
N/A	APS_045	N/A	Field boundary visible as an extant boundary on aerial imagery sources and the 2022 geophysical survey. No longer present.	Low

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	301A	The geophysical survey identified two curvilinear anomalies (301A) that were interpreted as possible archaeology.	Low to medium
N/A	N/A	432A	The geophysical survey identified a linear anomaly (432A) which has been interpreted as possible archaeology. It could be a northerly extension of a medieval hollow way recorded by aerial photography (HE_UID 1551517) 140m to the south.	Low
N/A	APS_044	N/A	An area of eroded Medieval / Post Medieval ridge and furrow.	Low
N/A	N/A	432D	The geophysical survey identified a linear feature on a north-west/south-east alignment which coincides with a former field boundary and associated small enclosure depicted on the 1st Ed OS map of 1888 (NLS, 2023).	Low
N/A	N/A	N/A	Cropmark evidence of the site of a demolished WWII structure associated with Leconfield Airfield to the south, visible on aerial imagery sources (HE UID_1401624). A historic spread has been identified by the geophysical survey in the area immediately surrounding this location.	Low
N/A	APS_033	N/A	Rectilinear ditch visible as a cropmark on aerial imagery sources. Mapped by NMP as Post Medieval field boundary. The geophysical survey picked up a series of unclear linear trends at this location on the same alignment.	Low
N/A	APS_027	N/A	An area of eroded Medieval / Post Medieval ridge and furrow.	Low
N/A	APS_021	N/A	Field boundary visible as cropmark on aerial imagery sources, also identified from the 2022 geophysical survey.	Low
N/A	APS_016	N/A	An area of Medieval / Post Medieval ridge and furrow which is now eroded to microtopography.	Low
N/A	N/A	417A	The geophysical survey identified a fragmentary trend [417A] in the south-west of the survey area which may indicate a former field boundary but could have a natural origin.	Low to medium
N/A	N/A	433A & 433B	The geophysical survey identified a rectilinear trend [433A] along the southern limits of the area. The nature and form of the anomaly suggests a possible archaeological origin. However, its location at the edge of the survey area complicates interpretation and it may have a natural origin. A linear trend aligned east-west [443B] has been detected in the west of the survey area. This appears to be a continuation of anomalies detected in Field 443 immediately to the east.	Low to medium

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	443A, 443C & 443E	The geophysical survey identified a series of linear trends [443A] in the northwest of the survey area which appear to form part of a possible prehistoric field system. They are categorised as having a probable archaeological origin due to their character and form. However, no known sites or cropmarks have been recorded within this area. Two strong parallel trends [443C] have been mapped in the northeast of the survey area. The data suggests a possible trackway, but they may be ploughing headlands associated with the ridge and furrow cultivation.	Low to medium
N/A	N/A	443B	The geophysical survey identified several weak linear trends [443B] which appear to be a continuation of a possible series of enclosures or field systems detected in Field 446 to the west.	Low to medium
N/A	N/A	474A, 474B & 474C	The geophysical survey identified a relatively well-defined linear trend [474A] in the northwest of the survey area, probably archaeological in origin. Iron Age / Roman cropmarks have been recorded 250m to the southwest. More poorly defined trends have been detected in the north [474B] and south [474C] of the survey area. These have been noted as having a possible archaeological origin but could be due to natural variations.	Low to medium
N/A	APS_008	N/A	An area of Medieval / Post Medieval ridge and furrow which is orientated approximately north-south is visible as eroded earthworks and cropmarks on aerial imagery sources.	Low
MHU13031	N/A	N/A	Milestone on York Road.	Low
N/A	APS_005	N/A	A former field boundary dating to the Post Medieval period was visible as an earthwork and was orientated approximately northwest-southeast. The feature has been removed and is no longer present. The geophysical survey detected ridge and furrow of the same alignment at this location.	Low
N/A	APS_001	N/A	An area of Medieval / Post Medieval ridge and furrow which is now eroded.	Low
MHU596	APS_002	N/A	Bank and ditch, Killingwold graves. The bank is orientated approximately northwest-southeast which is visible as an earthwork and a cropmark has been identified through aerial imagery sources.	Low to medium
N/A	APS_006	N/A	A ditch orientated approximately northwest-southeast which was visible as an earthwork has been identified through aerial imagery sources and is no longer extant.	Low
N/A	APS_007	N/A	A ditch orientated approximately northeast-southwest which is visible as an earthwork and later as a cropmark has been identified through aerial imagery sources.	Low
N/A	APS_004	N/A	A group of pits of unknown date are visible as cropmarks on aerial imagery sources.	Low to medium

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	560A	The geophysical survey identified a band of weakly enhanced response (560A) interpreted as probable archaeology, corroborating with an earthwork of a medieval bank visible on NMP mapping (HE UID_1568365).	Low to medium
N/A	N/A	560B	The geophysical survey identified a series of disjointed anomalies (560B) which have been interpreted as possible opencast mining or World War I practice trenches.	Low to medium
N/A	N/A	574A	The geophysical survey identified a series of disjointed anomalies (574A) which have been interpreted as possible opencast mining or World War I practice trenches. A natural origin is also possible.	Low to medium
N/A	N/A	1251A	The geophysical survey identified a circular anomaly (1251A) which has been interpreted as possible archaeology. It is possible that this represents the base of a limekiln.	Low to medium
N/A	N/A	N/A	Earthworks of a later prehistoric/Roman ditch system recorded on NMP mapping (HE UID_1087954).	Low to medium
N/A	APS_018	N/A	An area of eroded Medieval / Post Medieval ridge and furrow.	Low
Onshore Substation Zone				
N/A	APS_011	N/A	Partial cropmark remains of a Post Medieval field boundary, picked up by the geophysical survey in the north-west tip of the Onshore Cabling Route. Somewhat built over.	Low
N/A	APS_012	648B	Reinstated land following a Post Medieval extraction pit.	Low
N/A	APS_013	N/A	Cropmarks of a Prehistoric enclosure.	Low to medium
MHU15288	APS_017	N/A	WWII Heavy Anti-aircraft gunsite, 350m west of Butt Farm (Scheduled Monument). Comprises standing, earthwork and buried remains, including the core of four gun emplacements. The southern extent of the gunsite (not scheduled area) lies within the Onshore Development Area.	Low to medium
N/A	APS_026	N/A	An area of eroded Medieval / Post Medieval ridge and furrow, also identified during the geophysical survey.	Low
N/A	N/A	865A & 865B	The geophysical survey identified a series of linear trends [818A] on a predominantly east to west alignment. The outskirts of this anomaly lie within the Onshore Development Area.	Low

Humber HER ID	Aerial Imagery Site ID	Geophysical Anomaly ID	Description	Perceived Heritage Importance
N/A	N/A	818A	The geophysical survey identified a very well-defined circular anomaly [818A] in the northwest of the survey area, measuring approximately 30m in diameter. It is noted as possible, rather than probable, archaeology as the form of the response is not entirely consistent with a ring ditch type feature. It appears to be associated with an extant feature and an area of likely modern disturbance which might suggest a more recent origin. This feature was not identified during the archaeological evaluation.	Low
N/A	N/A	N/A	Dispersed features were identified during the archaeological trial trenching across the Onshore Substation Zone including an undated pit, several post-medieval field boundaries and small pits and a ditch which produced a single fragment of likely Iron Age or Romano-British pottery.	Low
Onward Connection to National Grid				
MHU13025	N/A	N/A	Site of shepherd hut.	Low
MHU13026	N/A	N/A	Well, north-west of site of shepherd hut.	Low
MHU3530	APS_030	N/A	Rectangular enclosures. Series of cropmark ditches which comprise a settlement site and likely field system including trackways, pits, enclosures, and a Bronze Age round barrow visible in aerial photographs, satellite imagery and LiDAR. Previously recorded on NMP mapping (HE UID_1565984).	Low to high
N/A	N/A	N/A	Cropmarks of a possible Iron Age / Roman field boundary recorded on NMP mapping (HE_UID_1566062).	Low to medium
N/A	N/A	896A	The geophysical survey identified a single linear trend (896A) in the west of the survey area, interpreted as possible archaeology. It could relate to an undocumented historical feature or have a natural origin.	Low
N/A	APS_040	N/A	An area of eroded Medieval / Post Medieval ridge and furrow which is orientated approximately north-south and is visible as earthworks and cropmarks on aerial imagery sources.	Low
N/A	APS_035	N/A	An area of former field systems and ditches which are visible as cropmarks through aerial imagery sources.	Low to medium

22.5.9 Above Ground Archaeological Remains and Heritage Assets

177. Features considered to represent above ground heritage assets within the Onshore Development Area are summarised in **Table 22-12**.

Table 22-12 Possible Above Ground Heritage Assets Within the Onshore Development Area

Humber HER ID	Aerial Imagery Site ID	Description	Perceived Heritage Importance
Landfall area			
MHU9992	N/A	WWII pillbox visible on Aps. Lozenge-shaped pillbox with rear blast wall still visible in 2009. Now in the centre of a large field.	Low to medium
MHU9990	APS_085	WWII pillbox, surrounding barbed wire obstruction, and a trackway are visible as structures on Aps. A trench, two potential weapons pits and bomb craters are also visible as earthworks.	Low to medium
Onshore Export Cable Corridor			
No above ground heritage assets were identified within the Onshore Export Cable Corridor.			
Onshore Substation Zone			
No above ground heritage assets were identified within the Onshore Substation Zone.			

178. These heritage assets represent only those within the Onshore Development Area which are considered to represent above ground remains as indicated by descriptive information held by the HER, through the assessment of aerial photographic, LiDAR and historic map analysis (**Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**), and following the heritage walkover survey (**Volume 7, Appendix 22-4 Heritage Walkover Survey Report (application ref: 7.22.22.4)**).

179. Those heritage assets which are described as above ground extant structures or earthworks within the HER information, but which were found to be no longer extant (due to coastal erosion) during the heritage walkover survey have been retained within **Table 22-11**.

180. It is acknowledged that examples of above ground historic earthworks are a rare resource within Holderness as a result of agricultural activity and as such are considered valuable where they do survive as above ground features.

22.5.10 Archaeological Potential within the Onshore Development Area

181. The overall archaeological potential within the Onshore Development Area, as assessed in the ADBA (**Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**) prior to the assessment of the geophysical survey data, is considered to be moderate, with the following key themes drawn out based on information available to date:

- There is limited potential for encountering archaeology of Palaeolithic date within the Onshore Development Area;
- Evidence of Mesolithic and Neolithic settlement activity largely comprises of stray finds of flint objects, with some evidence of settlement along the Onshore Export Cable Corridor suggesting a moderate potential for encountering unrecorded assets;
- Neolithic funerary activity is recorded within the Onshore Substation Zone and across the surrounding landscape suggesting a moderate to high likelihood for unrecorded assets relating to funerary practice;
- Evidence for Bronze Age and Iron Age activity is far more common within the Onshore Development Area with settlement activity recorded to the east of Routh and north of Long Riston, as well as evidence for funerary activity to the southeast of the Onshore Substation Zone. This suggests a moderate to high likelihood for unrecorded assets relating to settlement activity and funerary practice;
- Evidence of Roman occupation within the Onshore Development area is limited to a single Romano-British settlement site. Within the wider study area further activity is recorded including two Roman enclosures and various chance finds. This suggests a low to moderate likelihood for further unrecorded assets relating to settlement activity;
- High likelihood of unrecorded assets relating to the medieval period (and potentially the early medieval period) as evidenced by the agricultural use of the land and will likely relate to settlement particularly around Nunkeeling, Catfoss and Eske;
- Unrecorded assets of Post Medieval date are likely to relate to settlement, commerce, agriculture and industry activity concentrated around established villages and towns. Concentrated evidence is noted

around Skipsea, Riston Grange, Routh, Hull Bridge and the southern outskirts of Beverley; and

- Moderate likelihood of surviving unrecorded evidence relating to defensive measures during WWII particularly around the coastal areas.

182. A large number of undated assets including enclosures, ring ditches and field systems are also recorded within the Onshore Development Area which may be of prehistoric or Roman date.

183. The archaeological potential within the Onshore Development Area is based on an assessment of data obtained through an assessment of baseline data gathering and survey campaigns to inform the assessment.

22.5.11 Heritage Importance

184. The non-designated heritage assets within the Onshore Development Area (identified to date as part of this assessment) are examples of locally common features representing Medieval/Post Medieval agriculture, and modern military activity. Based on information available to date, these assets may contain evidence that would contribute to understanding the archaeological resource of the local area. They are therefore anticipated to be of low heritage importance.

185. Evidence of the Mesolithic, Neolithic, Bronze Age, Iron Age and Medieval periods has also been recorded across the Onshore Development Area. As well as stray finds and recorded 'sites', these have included earthworks and cropmarks. Given the uncertainty regarding the origin of potential sub-surface archaeological remains of this nature (based on available data), this chapter has been prepared in line with the precautionary principle whereby the highest likely level of importance may be assigned and assessed within section 22.6, as necessary. This precautionary approach represents good practice in archaeological impact assessment and reduces the potential for impacts to be under-estimated.

186. For the previously unrecorded non-designated heritage assets, identified as a result of the analysis of aerial photography, LiDAR data and historic mapping (**Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**) and geophysical survey (**Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**) it has not yet been possible to determine the precise nature, extent or date of these features. It may also be the case that some (or many) of the features prove to be non-archaeological. Given this uncertainty, these potential heritage assets have also been assigned a precautionary heritage importance, where appropriate, depending on the nature of the asset in

question, against which potential impacts have been assessed in section 22.6.

22.5.12 Heritage Setting Considerations

187. Designated and non-designated heritage assets have been considered as part of an ongoing heritage setting assessment, the initial results with respect to the Projects' onshore infrastructure are presented in **Volume 7, Appendix 22-5 Onshore Infrastructure Settings Assessment (application ref: 7.22.22.5)** and shown on **Volume 7, Figures 22-2a-c and 22-3a-h (application ref: 7.22.1)**.

188. Nineteen heritage assets have been identified where a change in setting could lead to harm to their significance. These are:

- Black Mill (NHLE 1310087 – Grade II Listed Building);
- Square barrow on Westwood Common, 50m west of Blackmill (NHLE 1013996 – Scheduled Monument);
- Oval barrow on Westwood Common, 55m northwest of Blackmill (NHLE 1014000 – Scheduled Monument);
- Bowl barrow on Westwood Common, 150m north of Blackmill (NHLE 1013991 – Scheduled Monument);
- Square barrow on Westwood Common, 120m south of Blackmill (NHLE 1013995 – Scheduled Monument);
- Bowl barrow on Westwood Common, 50m north of Blackmill (NHLE 1013992 – Scheduled Monument);
- Heavy Anti-aircraft gunsite, 350m west of Butt Farm (NHLE 1019186 – Scheduled Monument);
- Walkington Conservation Area;
- Beverley sanctuary limit stone, Walkington Cross (NHLE 1012591 – Scheduled Monument);
- Beverley sanctuary limit stone, Bentley Cross (NHLE 1012590 – Scheduled Monument);
- Bowl barrow 400m north of Highfield House (NHLE 1007731 – Scheduled Monument);
- The Minster Church of St John (Beverley Minster) (NHLE 1084028 – Grade I Listed Building);
- Risby Hall (NHLE 1001419 – Grade II Registered Park and Garden);
- Risby Jacobean gardens, hall and medieval settlement remains (NHLE 1018600 – Scheduled Monument);

- 'Cellar Heads' moated site and related ridge and furrow earthworks at Risby Park, 700m northwest of Risby Park Farm (NHLE 1015312 – Scheduled Monument);
- Old Hall (NHLE 1103420 – Grade II Listed Building); and
- Low Hall (NHLE 1103419, 1310090, 1346992 – Grade II Listed Buildings).

189. A setting assessment with respect to the Projects' offshore infrastructure has been scoped out of this assessment due to the distance of the Array Areas (99km) and potential offshore platform (52km) from the coastline. At this distance, changes to setting affecting heritage significance are unlikely to be significant.

22.5.13 Historic Landscape Characterisation

190. The Historic Landscape Character (HLC) data held by the Humber HER has been obtained as it assists in the interpretation of the current landscape's history and evolution and forms an aid to identifying areas of the landscape which may be sensitive to change. The HLC data is presented on **Figure 22.2.5** (**Volume 7, Appendix 22-2 Archaeological Desk Based Assessment (application ref: 7.22.22.2)**).

191. The majority of the Projects pass through land broadly identified as settlement, woodland or fields and enclosures. The woodland is mostly modern plantation, although a few small sections of ancient/semi natural or estate woodland are present. The current field pattern is a result of early and parliamentary planned enclosure. This is unsurprising given the rural agricultural landscape that the Projects pass through. Other entries within the non-designated heritage assets study area describe areas of historic earthworks, such as medieval villages (e.g. Eske DMV, Storkhill and Sandholme).

192. Overall, the HLC data identifies a distinctly rural landscape, the history of which is mostly related to the period of Enclosure (piecemeal and parliamentary). There are links to the earlier history of the landscape, however, with surviving earthworks of medieval villages and medieval moated manors. The route of the Projects passes through fields of distinctly modern agricultural character, with large fields bounded by hedgerows, some of which meet the criteria to be considered Important. Many of these fields were formed in the 20th century by amalgamation of smaller fields that were established in the period of Enclosure from the mid-18th century onwards.

22.5.14 Geomorphology Summary

193. LiDAR and aerial imagery were reviewed along the Onshore Export Cable Corridor to characterise the present-day geomorphology of the landscape which can be used to inform geoarchaeological and archaeological assessments.

194. Elevations across the Onshore Export Cable Corridor vary between approximately 0.3m OD and 55m OD. For the purpose of this assessment the Onshore Export Cable Corridor has been split up into three character zones based on geomorphology. Zone 1 covers the first 16km of the Onshore Export Cable Corridor (starting at the landfall), Zone 2 covers from 16km to 27km and Zone 3 from 27km to 35km (**Volume 7, Figure 20-1 Chapter 20 Flood Risk and Hydrology (application ref: 7.20.1)**).

195. Within Zone 1 the Onshore Export Cable Corridor makes landfall at the coast which comprises a beach backed by a cliff line that steeply inclines reaching elevations between 13m OD and 15m OD (**Plate 22-1**). The land behind the cliff is relatively lower as the Onshore Export Cable Corridor crosses a valley/basin feature that contains the Skipsea Drain. As the Onshore Export Cable Corridor heads west from the coast, the land gently rises to a maximum elevation of 22m atop of a chalk ridge running broadly north-south (part of the Yorkshire Wolds).

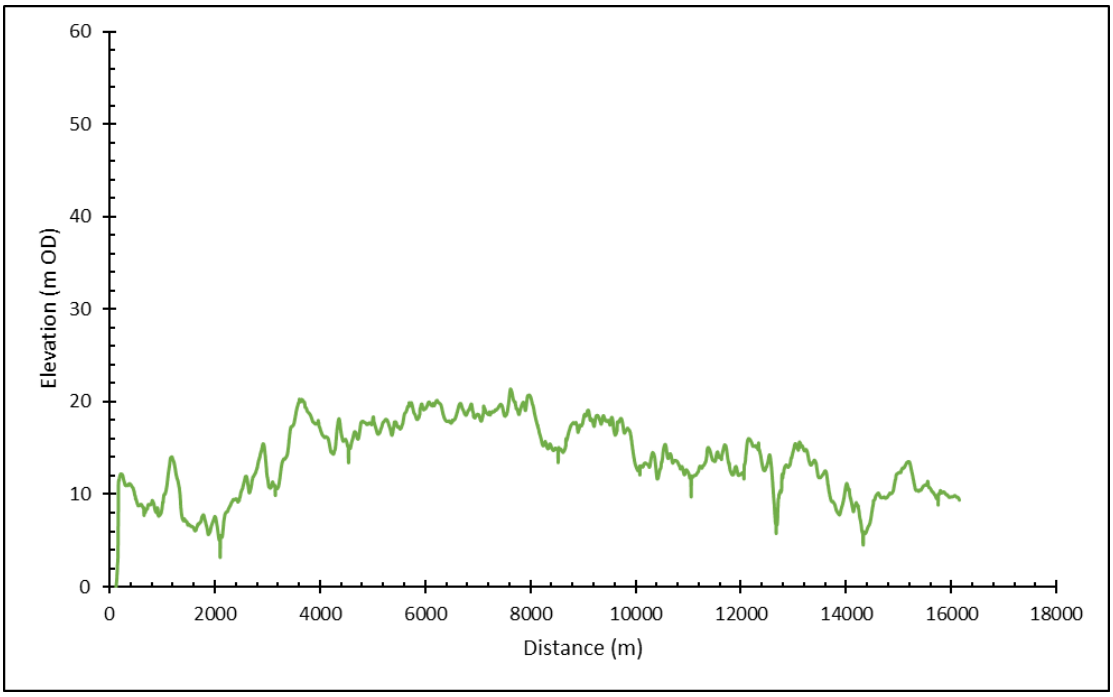

Plate 22-1 Character Zone 1 Profile

196. The Onshore Export Cable Corridor runs broadly north to south across the top and margins of this ridge and a series of small, v-shaped drainage ditches cross the Onshore Export Cable Corridor; there is no evidence of terracing on the margins of these ditches with the exception of Catfoss Drain. An elevation profile across this watercourse (**Plate 22-2**) shows the drain sits at the bases of a v-shape valley approximately 7m deep. The southern side of the valley is stepped creating a terrace feature at an elevation of 10m OD. This terrace may contain Pleistocene deposits of archaeological interest.

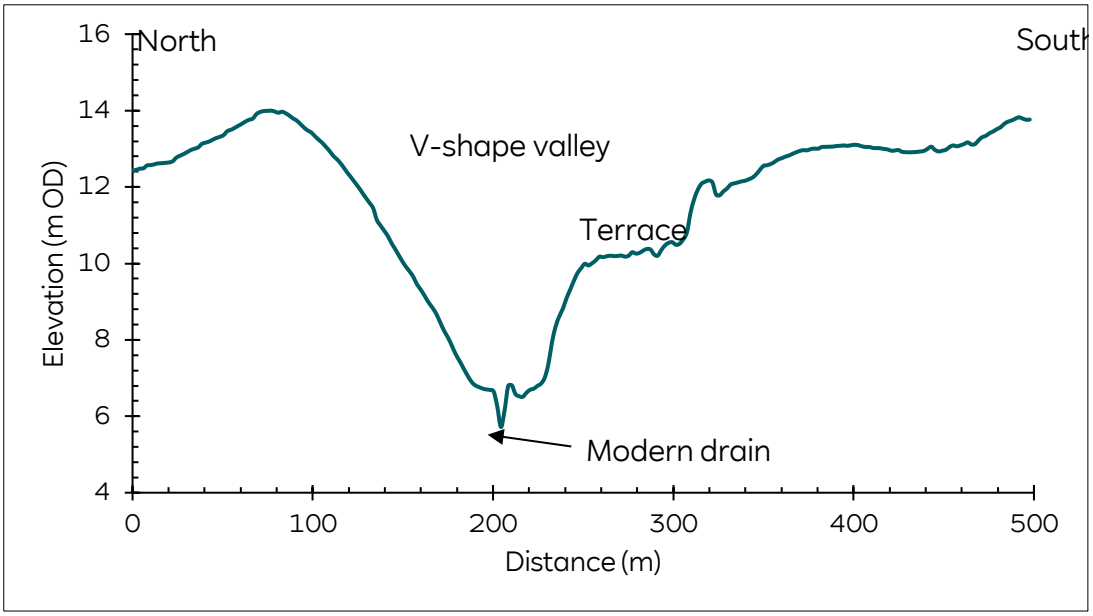

Plate 22-2 Profile showing cross section of the Catfoss Drain with a terrace feature on the southern side of the valley.

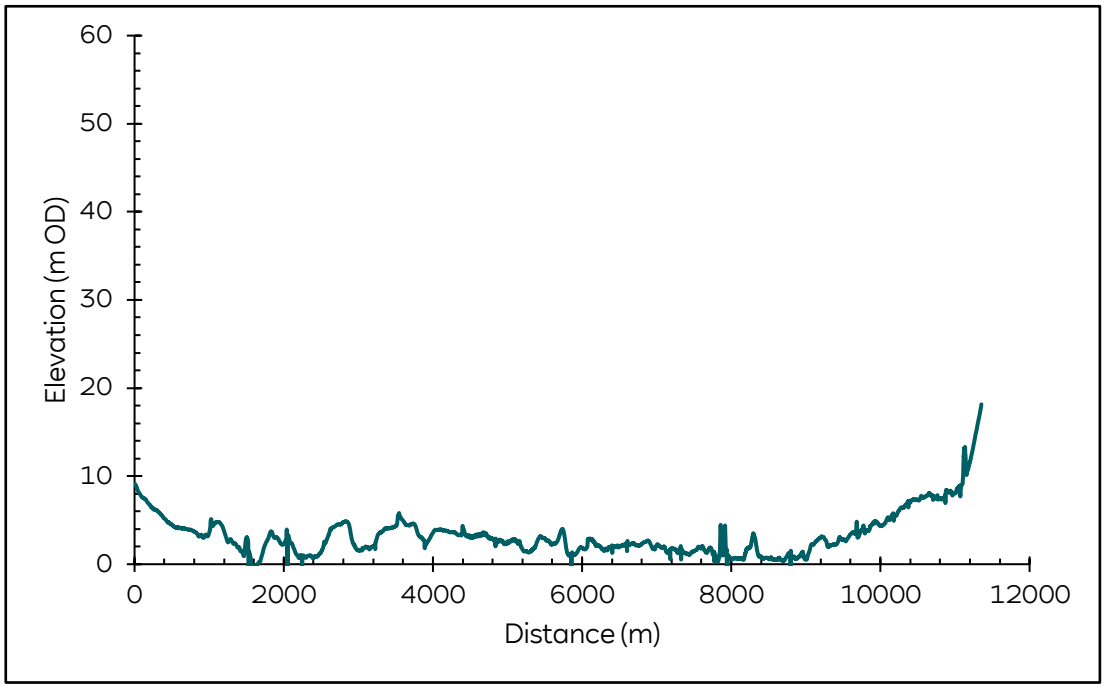

Plate 22-3 Character Zone 2 Profile

197. Zone 2 is defined as an area of relatively lower lying land (0.3m OD to 9m OD) in between two ridges which are part of the Yorkshire Wolds (**Plate 22-3**). Numerous narrow straightened artificial water courses are present in Zone 2, mainly tracing the outline of arable farmland. These watercourses sit within the floodplain of the River Hull, the largest watercourse crossing the Onshore Export Cable Corridor at 25-30m width. Fine-grained alluvial soils may be present within Zone 2 which may contain or cap archaeological material and sites.

198. The River Hull has been heavily modified by human intervention with flood levee embankments present on both side of the river with the Onshore Export Cable Corridor. There are localised areas of relatively higher ground (<2m higher than the surrounding land) within the floodplain which may be remnants of river terraces but as they are subtle features in the landscape, any interpretation of their formation history is tentative.

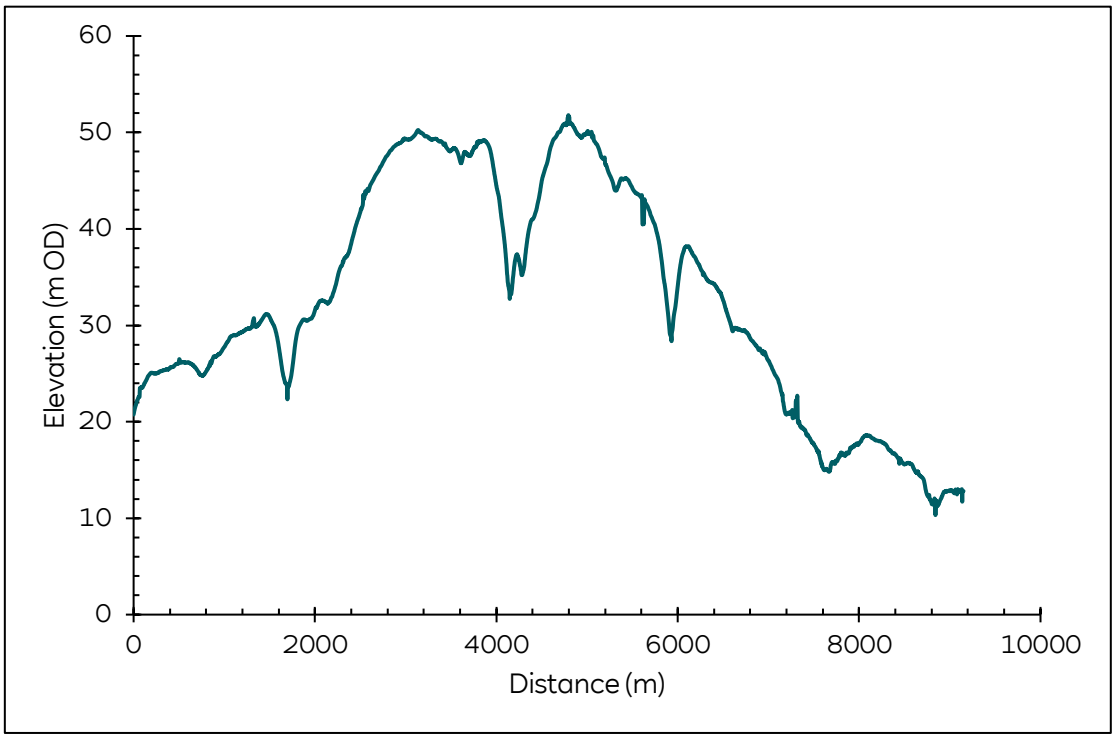

Plate 22-4 Character Zone 3 Profile

199. Zone 3 is characterised by a ridge reaching a maximum elevation (within the Onshore Export Cable Corridor) of 55m OD. On the eastern and western margins of the ridge, slope deposits such as colluvium and head may be present, potentially accumulating at the base of the slope within the Onshore Export Cable Corridor. These deposits are of archaeological interest as they may contain reworked artefactual material.

200. The top of the ridge is dissected by a series of dendritic water courses that drain the eastern margin of the ridge (**Plate 22-4**). These features are characterised by v-shape valleys and show no evidence of terracing along the margins. Modern drainage channels are present within the base of these valleys and alluvium may be present which is of archaeological interest due to its potential to preserve palaeoenvironmental material.

22.5.15 Geoarchaeological and Palaeoenvironmental Potential

201. A Geoarchaeological Desk-Based Assessment (GDBA) (**Volume 7, Appendix 22-6 Geoarchaeological Desk based Assessment (application ref: 7.22.22.6)**) identified deposits of archaeological and geoarchaeological interest within the Onshore Development Area. These include Holocene age alluvial, organic, and lacustrine deposits and colluvium, along with Pleistocene age glaciofluvial deposits and Head. Glacial till is present across the entire Onshore Development Area and whilst it has relatively low geoarchaeological potential, there is evidence near Skipsea of archaeological material being preserved on the surface of the deposit. The boundary between till and overlying deposits is therefore of archaeological interest.

202. Fine-grained alluvium is widespread at the landfall and between Leven to Woodmansey where the Onshore Export Cable Corridor crosses the River Hull valley. Elsewhere, alluvium may be present locally, where it infills depressions in the surface of the underlying Pleistocene deposits or associated with historic or modern river courses. Organic deposits have been recorded at the Landfall Zone and along the banks of the River Hull in the southwest of the Onshore Development Area.

203. Lacustrine deposits have similar characteristics to alluvium and can also contain layers of organic deposits. These were identified at the landfall area near Skipsea where they infill depressions in the underlaying deposits. These deposits are likely Late Pleistocene to Holocene age and formed when the climate was cool.

204. The alluvial and peat deposits are expected to be Holocene in age and evidence of prehistoric activity may survive beneath these deposits, although a high degree of reworking is expected. The organic deposits may preserve rare examples of wooden structures such as jetties or trackways.

205. Alluvial and lacustrine deposits provide moderate potential for the preservation of palaeoenvironmental proxies (e.g. pollen, ostracods, diatoms) which can be used to reconstruct changes in hydrology, climate, and local ecology, including human influence. Organic deposits within these sequences present moderate to high potential for preservation of proxies such as pollen and plant macrofossils, which can aid in reconstruction of changing environments in the past in relation to human history.

206. There is some potential for colluvium (mixed sediment) to be present at the Landfall Zone. Colluvium has low potential to preserve archaeological or palaeoenvironmental remains, but it may seal and bury earlier archaeology or geoarchaeologically significant deposits.

207. Coarse-grained glaciofluvial deposits that formed in a high energy environment during the last glacial period have moderate potential to preserve Palaeolithic material although if present, remains are likely to have undergone significant erosion. They also have low potential to preserve palaeoenvironmental material. The discovery of prehistoric material associated with these deposits in the vicinity of the landfall location suggest their archaeological potential is high at this location, although there is some uncertainty about the extent of these deposits in the eastern parts of the Onshore Export Cable Corridor. Elsewhere, glaciofluvial deposits are present along the margins of the River Hull where they likely represent an earlier phase of river activity adjacent to the modern River Hull. Glaciofluvial deposits are present in southern parts of the Onshore Export Cable Corridor but here their potential is more limited.

208. Pleistocene age Head deposits have been mapped by the British Geological Survey (BGS) within the Onshore Export Cable Corridor between Beverley and Bentley and also within the Onshore Substation Zone. Head has low to moderate potential to preserve archaeological and palaeoenvironmental remains, but it may seal or bury earlier archaeology.

209. Glacial till is present across the entire Onshore Development Area and whilst it has relatively low geoarchaeological potential, there is evidence near Skipsea of archaeological material being preserved on the surface of the deposit. The boundary between till and overlying deposits is therefore of archaeological interest.

22.5.16 Archaeological and Geoarchaeological Monitoring of Ground Investigation

210. The following is a summary of the Archaeological and Geoarchaeological Monitoring of Ground Investigation Works (**Volume 7, Appendix 22-9 Archaeological and Geoarchaeological Watching Brief and Deposit Model Report (application ref: 7.22.22.9)**) carried out in 2023.

211. The geoarchaeological watching brief and borehole monitoring exercise comprised the monitoring of 23 geotechnical boreholes to a maximum depth of c. 35m BGL, and 12 geotechnical test pits to a maximum depth of c. 3.6m BGL across the Onshore Development Area (**Figure 22-9-2 to 22-9-4, Volume 7, Appendix 22-9 Archaeological and Geoarchaeological Watching Brief and Deposit Model Report (application ref: 7.22.22.9)**). The monitoring of these interventions contributed data and updated the previous deposit model outlined in the **GDBA** (**Volume 7, Appendix 22-6 Geoarchaeological Desk based Assessment (application ref: 7.22.22.6)**).

212. No archaeological features were identified within any of the GI trial pits. A few pieces of unstratified Roman pottery were recovered from the ground surface approximately 6m to the south of TP3402, and one sherd of Roman greyware pottery from c. 7m to the south of TP3404. These were found on the ground surface and as such are likely to have been redeposited by agricultural activity such as ploughing. Even though they may be indicative of further remains of Romano-British date within the vicinity, these trial pits are now situated between 250 and 315m beyond the northeast of the Onshore Development Area.

213. A possible archaeological deposit was recorded in BH504, between 0.35 and 0.40m BGL. The deposit was of mid greyish brown with mid to dark grey speckles, and comprised slightly clayey, sandy silt. Inclusions of CBM fragments and charcoal, as well as small, rounded stones were observed.

214. Based on distribution and character of the deposit sequence, as identified in the deposit model, updated areas of archaeological and palaeoenvironmental potential (AoP) have been mapped for the Onshore Development Area. These are summarised below and presented on **Table 4** and **Figures 22-9-49 to 22-9-52** in **Appendix 22-9 Archaeological and Geoarchaeological Watching Brief and Deposit Model Report** (**Volume 7 (application ref: 7.22.22.9)**).

- AoP-A: Holocene alluvium/tidal deposits, organic deposits, lacustrine deposits, and colluvium (Moderate to high potential);
- AoP-B: Glaciofluvial deposits (Moderate to low potential);
- AoP-C: Head deposits (Low potential); and
- AoP-D: Near surface glacial till (Low potential).

22.5.17 Future Trends

215. If the Projects are not developed, an assessment of future conditions for Onshore Archaeology and Cultural Heritage has been carried out and is described within this section.

216. The historic environment is vulnerable to the effects of climate change. Changes to environmental conditions have the potential to alter the range of flora and fauna within the environment, thereby potentially changing the inherent character of historic and designated landscapes and affecting historic building materials (e.g. fungal/plant growth and insect infestation due to the effects of global warming).

217. Extremes in temperature and cycles of wetting and drying resulting from climate change can also damage historic buildings, landscapes and buried archaeological remains, variously as a result of soil saturation and shrinkage and changes to soil chemistry.

218. Waterlogged archaeological and palaeoenvironmental remains are particularly vulnerable in this regard, with the desiccation of soils and lowered groundwater levels potentially increasing the risk of decay to such remains, if and where present. These damaging cycles create stressful environments for buried archaeology, with preservation *in situ* becoming increasingly difficult. Given that heritage assets, and the contexts in which they survive vary, it follows that multiple factors may affect their survival, stabilisation, or decay. On this basis, broad-scale strategies to safeguard the historic environment from the effects of climate change are therefore difficult to determine, with no one single solution available.

219. Elements of climate change considered to be of relevance to the Onshore Development Area include those associated with sea level change and erosion, which have the potential to damage and de-stabilise coastal heritage assets. In particular, increased frequency and severity of storms, coupled with sea level rise, will likely impact coastal heritage assets and in the medium to long-term, sea-level rise is likely to drive a very significant change. The sub-surface archaeology which is exposed, investigated, and recorded to professional standards may, however, be considered a public benefit in terms of understanding of and building upon the archaeological record, and certainly preferable to assets and remains being lost altogether. This is particularly relevant for the landfall, where geophysical survey and archaeological trial trenching has already taken place.

22.6 Assessment of Significance

220. This section outlines potential impacts as a result of the Projects, their likely magnitude and the resulting significance of any effects when compared against the heritage importance of assets assessed, using the assessment methodology described in section 22.4.

221. A range of potential impacts may occur to onshore archaeology and cultural heritage assets as a result of changes during the construction, operation and decommissioning of the Projects. The Projects have the potential to impact upon the historic environment resource in a number of ways, through direct (physical) changes, indirect (physical) changes, and indirect (non-physical) changes to the setting of heritage assets. Some impacts and changes would be temporary and others permanent, some confined to the construction phase and others more permanent during operation and the lifespan of the Projects, and subsequent

decommissioning. A summary of all potential impacts identified for onshore archaeology and cultural heritage is provided in section 22.11.

22.6.1 Potential Effects During Construction

222. Direct (physical) impacts, as stated in the NPS EN-3 (DESNZ, 2023b), encompass direct effects from the physical siting of the Onshore Development Area. Potential direct impacts thus comprise both direct damage to archaeological deposits and material and the disturbance or destruction of relationships between deposits and material and their wider surroundings. This may include buried archaeological remains. Consequently, all aspects of the Projects which involve intrusive groundworks have the potential to affect heritage assets with archaeological interest (e.g. buried archaeological remains) through direct physical change.

223. The Projects also have the potential to change local hydrological processes which in turn may result in impacts of an indirect (physical) nature occurring upon buried archaeological deposits through either desiccation or waterlogging.

224. Indirect (non-physical) impacts on the historic environment include heritage assets being affected by change in their setting. Indirect (non-physical) impacts upon significance as a result of change in the setting of heritage assets have the potential to occur throughout the lifetime of the Projects, thus encompassing all phases, from construction, into operation and subsequent decommissioning. Indirect non-physical impacts upon the setting of heritage assets are most relevant as a result of the presence of above ground infrastructure for the Projects during the operational phase, effects of which may be long-term or 'permanent' in nature. Indirect non-physical impacts upon the setting of heritage assets may also arise as a result of construction and decommissioning works, although effects would be, by comparison, shorter in duration and of a temporary nature.

225. The impact assessment as presented in this chapter assumes that activities associated with construction may theoretically occur anywhere within the Onshore Development Area, and a worst case impact of removal of all elements of that heritage asset within the Onshore Development Area in each case has been assumed.

226. As such, the classes of heritage assets that will be taken forward into the impact assessment:

- Below ground archaeology:

  - Areas of possible archaeological interest (including designated and non-designated buried archaeological heritage assets) (ranging between anticipated low and high, as a worst case, heritage importance);
  - Unknown potential buried archaeological remains (precautionary high heritage importance until evidenced otherwise); and
  - Geoarchaeological and palaeoenvironmental deposits (precautionary medium heritage importance until evidenced otherwise).
- Above ground archaeology/built heritage assets:
  - Designated heritage assets (medium to high heritage importance); and
  - Areas of possible archaeological/cultural heritage interest (including non-designated above ground archaeology and cultural heritage assets, e.g. earthworks and standing structures) (ranging between anticipated low to high, as a worst case, heritage importance).
  - Individual archaeological heritage assets are identified at Table 22-11.

22.6.1.1 Impact 1 Direct Physical Impact on (Permanent Change to) Designated Heritage Assets

227. Impacts resulting in potential effects as part of the construction work are those associated with intrusive groundworks, including:

- The removal of topsoil anywhere across the Onshore Development Area;
- Open cut trenching as part of the Onshore Export Cable installation works;
- The excavation of Jointing Bays, HDD launch/receiver pits and Link Boxes along the Onshore Export Cable Corridor;
- Groundworks associated with the Onshore Export Cable Corridor easement and associated access trackways;
- Vibration from trenchless crossing (e.g. HDD) drilling and other intrusive groundworks associated with trenchless techniques; and
- Accidental damage from plant movement and other construction traffic.

228. Any direct (physical) impact to designated heritage assets (and their associated heritage significance) should be weighed against the public

benefit of development, recognising that the greater the harm to the significance of the heritage asset the greater the justification would be needed for any loss (EN-1, paragraph 5.9.30). Any direct (physical) impact would likely be permanent and irreversible. If disturbed or removed without an appropriate record having been made, their context and relationship to other heritage assets is partially or completely lost and their heritage significance is as such likely to be reduced.

229. The Onshore Development Area avoids all known designated heritage assets (e.g. Conservation Areas, Scheduled Monuments, Listed Buildings, etc.) and as such, no direct physical impacts are anticipated to occur to designated heritage assets.

22.6.1.2 Impact 2 Direct Physical Impact on (Permanent Change to) Non-designated Heritage Assets (Including Buried Archaeological Remains, Historic Earthworks and Structures)

230. Impacts resulting in potential effects as part of the construction work are those associated with intrusive groundworks, including:

- The removal of topsoil anywhere across the Onshore Development Area;
- The excavation of Transition Joint Bays at the landfall;
- The application of trenchless crossing techniques (e.g. HDD or similar) at the landfall;
- Open cut trenching as part of the Onshore Export Cable installation works;
- The excavation of Jointing Bays, trenchless crossing launch/receiver pits and Link Boxes along the Onshore Export Cable Corridor;
- Groundworks associated with the Onshore Export Cable Corridor easement and associated access trackways;
- Groundworks associated with the Onshore Substation Zone;
- Vibration from trenchless crossing drilling and other intrusive groundworks;
- Excavations associated with landscaping and planting; and
- Accidental damage from plant movement and other construction traffic.

231. Any adverse impacts (and associated effects) upon sub-surface archaeological remains, geoarchaeological/palaeoenvironmental deposits, and above ground heritage assets due to construction-related works would likely be permanent and irreversible in nature. Once archaeological deposits,

and the relationships between deposits, material and their wider surroundings have been damaged or disturbed, it is not possible to reinstate or reverse those changes. As such, direct physical impacts to an asset's fabric (where elements lost contribute to heritage significance) can represent a total loss of an asset's heritage significance, or parts of it, and the character, composition or attributes of the asset may be fundamentally changed or lost from the site altogether.

232. A staged programme of assessment has been carried out to aid the understanding of potential archaeological remains and their likely heritage significance in the non-designated heritage assets study area and more specifically within the Onshore Development Area. This approach has identified several areas of possible archaeological and geoarchaeological interest, which have been assigned predicted heritage significance levels between low and high. Those considered to be most vulnerable regarding the various elements of construction are highlighted below.

233. It should also be emphasised that the potential for buried archaeological remains, geoarchaeological/palaeoenvironmental remains, and above ground heritage assets, not currently represented by the desk-based and non-intrusive survey data, to be impacted as a result of construction works should not be discounted. In the absence of further data regarding the 'potential' archaeological resource, such assets must be considered as potentially having a high perceived heritage significance.

234. Extant earthworks, field boundaries and ancient woodland are an integral part of the HLC. Any loss of such features arising as a result of construction-related activities therefore has the potential to impact upon an integral part of the HLC within the Onshore Development Area and wider surrounds.

22.6.1.2.1 Magnitude of Impact – DBS East or DBS West in Isolation

235. Any direct physical impacts on the significance of buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets are often considered to be of high magnitude. However, the extent of any impact will often depend on the presence, nature and depth of any such remains, in association with the depth of construction-related groundworks, as well as the specific elements, aspects or areas of the asset subject to impact (including the level to which these may or may not contribute to heritage significance).

236. As such, a reduced magnitude of impact may be relevant where the anticipated interaction between the proposed groundworks and buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets (as indicated by available data) is considered

to be unlikely or limited in terms of impact upon the asset's heritage significance. The magnitude of direct physical impacts on buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets during the construction phase could therefore range from negligible to high. This is equivalent to no loss of significance to substantial harm.

237. It should be noted that there is still a degree of uncertainty regarding the nature, extent and depth of any buried archaeological and geoarchaeological / palaeoenvironmental remains in areas not subject to intrusive evaluation therefore, direct physical impacts from construction works within the Onshore Development Area could represent up to a high adverse magnitude of impact.

22.6.1.2.2 Magnitude of Impact – DBS East and DBS West Together

238. The worst case scenario for direct physical impacts on buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets will be based upon the general assumption that the greatest potential footprint for both DBS East and DBS West represents the greatest potential for direct physical impacts (e.g. damage/destruction) to surviving buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets.

239. The combined footprint of both DBS East and DBS West, therefore, represents a greater potential for direct impacts than if, for example, only DBS East or DBS West were to be built in isolation. However, whilst there is a greater potential for direct impacts, the increased footprint of DBS East and DBS West together would not lead to an increase to the magnitude of impact for any of the identified buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets.

22.6.1.2.3 Sensitivity of Receptor

240. For the purposes of the assessment below, sub-surface archaeological remains have been grouped in **Table 22-11** where these features are more appropriately considered together as elements of a larger and more significant heritage asset. This also allows consistency with the HER records which adopt the same approach. An example of this is Geophysical Anomalies 1312A, 1312B, 1312C, 1312D, 1312E and 1312F, which taken together, represent the apparent survival of a Romano-British settlement rather than a series of discrete features.

241. In all cases, designated heritage assets have been assessed individually in the assessment below, although for the purposes of discussing setting and change to setting, some were grouped together in the Onshore Infrastructure Settings Assessment (**Volume 7, Appendix 22.5 Onshore Infrastructure Settings Assessment (application ref 7.22.22.5)**) to allow for discussion of the relationship between these heritage assets which essentially share key elements of significance and aspects of setting that contribute positively to that significance without excessive repetition.

22.6.1.2.3.1 Landfall Zone

242. Data available and assessed to date (as part of this assessment) within the landfall locations indicate a predominance of features associated with WWII. The majority have been damaged by coastal erosion and are now located along the foreshore. However, two pillboxes survive in relatively good condition within the Landfall Zone. Based on the information available to date, the heritage assets relating to extant WWII structures and associated sub-surface remains have been assigned a low to medium heritage importance.

243. The aerial photographic and LiDAR assessment (**Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**) and geophysical survey (**Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**) have recorded a rectilinear enclosure in the northwest of the area and a series of curvilinear trends are observable in the southeast which have the appearance of a trackway. The archaeological evaluation carried out at landfall (**Volume 7, Appendix 22-8 Interim Archaeological Evaluation Report (application ref: 7.22.22.8)**) identified some level of archaeological activity across the whole Landfall Zone which have been assigned low to high heritage importance.

244. Notable concentrations of more significant activity (as identified in the geophysical survey) suggestive of settlement are located in two key zones in the northwest and southeast.

245. The archaeological features in the northwest corner of the landfall zone represent medieval settlement over more than one phase of activity and consist of large boundary ditches, smaller ditches probably functioning as field or plot divisions, several curvilinear gullies and a posthole which may indicate structural remains, and pits of varying sizes. Documentary research undertaken by HAP suggests that this is highly likely to be the location of the 'lost' medieval hamlet of Cleeton (pers. Comm. Richard Newman, Principal Archaeologist, HAP). These remains have been assigned high heritage importance.

246. In the southeast corner of the Landfall Zone a double-ditched trackway along with settlement environs of probable Iron Age to Roman activity was located. It appears that concentrated settlement activity was confined to the southeast corner of the landfall zone, the trackway further west perhaps marking a route linking the settlement with field systems and potentially other settlements in the surrounding landscape. These remains have been assigned medium-high heritage importance.

247. The landfall area is also likely to contain alluvium which is of geoarchaeological interest as it may contain or partially mask Holocene archaeological features and/or layers, preserve palaeochannels and contain peat or richly-organic units that have moderate to high palaeoenvironmental potential. Organic deposits have been recorded at the landfall area as well as lacustrine deposits which are likely to be of Late Pleistocene to Holocene date. In addition, the discovery of prehistoric material associated with glaciofluvial deposits in the vicinity of the possible landfall area suggest a high potential for preserving Palaeolithic material. Due to the uncertainty of the heritage significance of these deposits, in the absence of further assessment and survey these deposits have been assigned a precautionary medium heritage importance.

22.6.1.2.3.2 Onshore Export Cable Corridor

248. Data available and assessed to date within the Onshore Export Cable Corridor indicates the potential presence of sub-surface archaeological remains of varying type. Due to the extent of the Onshore Export Cable Corridor, the large number of possible areas of archaeological interest currently identified and the inability to accurately ascertain the presence/absence, nature and extent of the potential buried remains within it, it is not possible at this stage of enquiry to identify each and every heritage asset representative of below ground archaeology that may be impacted by construction works associated with the Onshore Development Area.

249. Areas of notable features within the Onshore Development Area are presented in section 22.5.3, and all recorded heritage assets relating to potential sub-surface remains are listed in **Table 22-11**. These areas have been variously assigned a low to high perceived heritage importance based on information available to date, with most features falling within the low – medium categories.

250. With respect to the potential presence of geoarchaeological/palaeoenvironmental remains, alluvium is likely to be present between Leven and Woodmansey where the Onshore Export Cable Corridor crosses the River Hull valley and may be present locally where it infills depressions in the surface of the underlying Pleistocene deposits or associated with historic or modern river courses. As noted above, alluvium is of geoarchaeological interest. Organic deposits have also been recorded along the banks of the River Hull in the southwest of the Onshore Development Area.

251. Glaciofluvial deposits which have a moderate potential to preserve Palaeolithic material, although a low potential to preserve palaeoenvironmental material, are present along the margins of the River Hull where they likely represent an earlier phase of river activity adjacent to the modern River Hull. Glaciofluvial deposits are present in southern parts of the Onshore Export Cable Corridor but here their potential is more limited.

252. Pleistocene age Head deposits have been mapped within the Onshore Export Cable Corridor between Beverley and Bentley; these have a low to moderate potential to preserve archaeological and palaeoenvironmental remains, however they may seal or bury earlier archaeology. Due to the uncertainty of the heritage significance of these deposits, in the absence of further assessment and survey these deposits have been assigned a precautionary medium heritage importance.

22.6.1.2.3.3 Onshore Substation Zone

253. Data available and assessed to date for the Onshore Substation Zone include cropmarks and geophysical anomalies representing ring ditches and enclosures and associated field systems of unknown date within Onshore Substation Zone. There are also potential remains associated with the Heavy Anti-aircraft gunsite (NHLR 1019186), which lie outside the scheduled area and could include the site of radar equipment and associated structures. These potential sub-surface archaeological remains have all be recorded from aerial imagery (**Volume 7, Appendix 22-3 Assessment of Airborne and Satellite Remote Sensing Data and Map Regression Analysis for Archaeology (application ref: 7.22.22.3)**) and the geophysical survey (**Volume 7, Appendix 22-7 Geophysical Assessment Report (application ref: 7.22.22.7)**). The archaeological evaluation carried out at the Landfall Zone (**Volume 7, Appendix 22-8 Interim Archaeological Evaluation Report (application ref: 7.22.22.8)**) identified significant archaeological features generally survived in the low-lying region however these are now outside the Onshore Development Area. Dispersed features were located across the remainder of the Onshore Substation Zone including and undated pit, several post-medieval field boundaries and small pits and a ditch which produced a single fragment of likely Iron Age or Romano-British pottery. Based on the assessment carried out to date within the Onshore Substation Zone, these remains have been assigned a low to medium heritage importance.

254. Within the southern extent of the Onshore Substation Zone, Head deposits of Pleistocene date have been mapped which have been assigned a precautionary medium level of heritage importance.

22.6.1.2.4 Significance of Effect – DBS East or DBS West in Isolation

255. The importance of the receptors potentially affected by this impact ranges from low to high. In a worst case scenario, there would be a high adverse magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**) without mitigation, should impacts occur within either DBS East or DBS West in isolation, these have the potential to be of **major** adverse significance.

22.6.1.2.5 Significance of Effect – DBS East and DBS West Together

256. The potential significance of effect for direct (physical) impacts to buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets, without mitigation, is the same for DBS East and DBS West together as for DBS East or DBS West in isolation (i.e. any direct impacts have the potential to be of **major** adverse significance).

22.6.1.2.6 Mitigation and Residual Significance of Effect – DBS East or DBS West in Isolation

257. The Applicants have committed to undertake additional programmes of survey and evaluation where of relevance to sub-surface archaeological remains, which may include any remaining geophysical survey and a scheme wide programme of trial trenching. This strategy is outlined as part of a project-specific **Outline Onshore WSI (Volume 8, application ref: 8.14**). The survey and evaluation work may indicate the presence of previously unknown buried archaeology (and further verify previously known/anticipated buried remains as indicated by the previous non-intrusive survey methods), enabling the resource to be appropriately addressed by means of mitigating any impacts in a manner that is proportionate to the significance of the remains present.

258. Archaeological mitigation is envisaged to comprise a combination of the following recognised standard approaches:

- Further advance and enacting of preservation *in situ* options and requirements (e.g. avoidance/micro-siting/HDD etc., where possible);
- Archaeological excavation: including subsequent post-excavation assessment, and analysis, publication and archiving;
- Archaeological monitoring/watching brief: including subsequent post-excavation assessment, and analysis, publication and archiving (where appropriate); and
- Earthwork condition surveys: including subsequent reporting and archiving (followed by backfilling and reinstatement, where required on a case-by-case basis).

259. Impact to the HLC (including hedgerows and parish boundaries) will be minimised by returning field boundaries/areas/hedgerows to their pre-construction condition (noting the limitations of planting directly over the cables) and character post-construction, as part of a sensitive programme of backfilling and reinstatement/landscaping. A commitment to reducing hedgerow loss by pinching the corridor at crossings has also been made through reducing the corridor to (max) 34.2m in these areas. Certain hedgerows and field boundaries (e.g. parish boundaries) may require recording prior to the construction process and enhanced provisions made during reinstatement. Areas of ancient woodland within the Onshore Development Area will be avoided.

260. The site-specific measures adopted by the Applicants will be determined post-consent as the Projects progress in a specific and bespoke manner, tailored on a case-by-case/area-by-area basis (as required) accordingly and in response to the combination of onshore archaeological and cultural heritage assessment. Opportunities to optimise the programme, including expedient commencement of archaeological work in the immediate post-consent stages will also be sought in ongoing discussion and agreement with the Historic Environment ETG.

261. The preferred and optimum mitigation measure is preservation *in situ*, wherever possible. By avoiding buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets, either largely or in their entirety (as indicated by existing and available data), the magnitude of impact may be reduced depending on the extent of the asset in question (with reference to change or impact upon heritage significance) and the degree to which preservation *in situ* has been applied.

262. Where avoidance is not possible, significant impacts upon buried archaeological and geoarchaeological/palaeoenvironmental remains, and above ground heritage assets may potentially, to a degree, be off-set by the application of appropriate alternative mitigation measures which serve to preserve archaeological remains, where present, by record (e.g. following intrusive evaluation and subsequent excavation, where required).

263. Although preservation by record cannot be considered to reduce the magnitude of impact (and associated significance of effect) per se, given the physical loss of a given asset, the acquisition of a robust archaeological record of an asset may be considered to adequately compensate identified, recognised and acceptable harm to a heritage asset in line with industry standard good practice mitigation measures and compatible with the definitions outlined in section 22.4.3.

264. With the application of mitigation through preservation by record, it is anticipated that there would be a negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms. The application of mitigation by preservation in situ would result in no impact.

22.6.1.3 Mitigation and Residual Significance of Effect – DBS East and DBS West Together

265. The application of mitigation (as detailed above) will be the same for the construction of both DBS East and DBS West, as for either Project built in isolation. Therefore, with the application of mitigation through preservation by record, it is anticipated that there would be a negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms. The application of mitigation by preservation *in situ* would result in no impact.

22.6.1.4 Impacts 3 and 4 Indirect Physical Impact on (Permanent Change to) Designated and Non-designated Heritage Assets

266. Potential indirect impacts to designated and non-designated heritage assets from changes to ground conditions is assessed with reference to **Volume 7, Chapter 20 Water Flood Risk and Hydrology (application ref: 7.20)**.

267. Construction activities undertaken as part of the Projects have the potential to affect below ground deposits of archaeological and geoarchaeological interest over a wider area than that of the footprint of the Projects. For example, through hydrological changes that may cause desiccation and drying out of wetland deposits and associated preserved waterlogged archaeological or geoarchaeological remains.

268. In addition to potential changes to ground conditions, potential indirect impacts to designated and non-designated heritage assets could occur due to vibration from groundworks affecting the fabric of a heritage asset. This is assessed with reference to **Volume 7, Chapter 25 Noise (application ref: 7.25)**.

22.6.1.4.1 Magnitude of Impact – DBS East or DBS West in Isolation

269. As the presence/absence, nature, and extent of deposits of geoarchaeological and palaeoenvironmental interest is currently unknown (or not fully established) within the Onshore Development Area, it is not possible to identify potential impacts according to the various elements of construction. As a worst case scenario, it is anticipated that any indirect physical impact could result in a medium adverse magnitude of impact, which is equivalent to less than substantial harm.

270. Potential for vibration from groundworks affecting the fabric of a heritage asset (both designated and non-designated) would likely occur through the operation of the trenchless crossing technique (e.g. HDD) and ancillary

equipment taking place within the Onshore Development Area. Any vibration created during the construction phase could have an indirect physical impact upon heritage assets. The operation of the trenchless crossing technique (e.g. HDD) and ancillary equipment would produce the greatest vibration impacts along the Onshore Export Cable Corridor.

271. The vibration effects from the operation of the trenchless crossing technique (e.g. HDD) and ancillary equipment within the Onshore Export Cable Corridor is assessed within **Volume 7**, **Chapter 25 Noise (application ref: 7.25)** section 25.6.1.5 as being of no greater than negligible magnitude of impact. Therefore, the magnitude of impact from vibration effects upon non-designated heritage assets is no greater than negligible. There is considered to be no vibration effects upon designated heritage assets within the Designated Asset Study Area (all designated heritage assets are avoided by the Onshore Development Area).

22.6.1.4.2 Magnitude of Impact – DBS East and DBS West Together

272. The worst case scenario for indirect physical impacts on deposits of geoarchaeological and palaeoenvironmental interest will be based upon the general assumption that the greatest potential footprint for both DBS East and DBS West represents the greatest potential for indirect physical impacts to deposits of geoarchaeological and palaeoenvironmental interest.

273. The combined footprint of both DBS East and DBS West, therefore, represents a greater potential for indirect physical impacts than if, for example, only DBS East or DBS West were to be built in isolation. However, whilst there is a greater potential for indirect physical impacts, the increased footprint of DBS East and DBS West together would not lead to an increase to the magnitude of impact for any deposits of geoarchaeological and palaeoenvironmental interest.

274. The combined footprint and greater number of trenchless crossings (e.g. HDD) of both DBS East and DBS West represents a greater potential for indirect physical impacts from the operation of the trenchless crossing and ancillary equipment upon non-designated heritage assets than if, for example, only DBS East or DBS West were to be built in isolation. However, whilst there is a greater potential for indirect physical impacts, the increased footprint and greater number of trenchless crossings (e.g. HDD) of DBS East and DBS West together would not lead to an increase to the magnitude of impact upon non-designated heritage assets from vibration effects.

22.6.1.4.3 Sensitivity of Receptor

275. Areas which contain deposits of geoarchaeological interest (based on available data) have been identified by a geoarchaeological desk-based assessment (**Volume 7, Appendix 22-6 Geoarchaeological Desk based Assessment (application ref: 7.22.22.6)** and **Volume 7, Appendix 22-9 Archaeological and Geoarchaeological Watching Brief and Deposit Model Report (application ref: 7.22.22.9)**). This approach has identified several areas of possible geoarchaeological and palaeoenvironmental interest, which have been assigned a precautionary medium heritage importance (until evidenced otherwise).

276. With respect to non-designated heritage assets which could be affected by vibration; these range from a level of low to high heritage importance (**Table 22-11** and **Table 22-12**).

22.6.1.4.4 Significance of Effect – DBS East or DBS West in Isolation

277. In accordance with the significance of effect matrix (**Table 22-9**) without mitigation, should impacts occur from changes to hydrological processes within either DBS East or DBS West in isolation, these have the potential to be of **moderate** adverse significance.

278. In accordance with the significance of effect matrix (**Table 22-9**) without mitigation, should impacts occur from vibration effects within either DBS East or DBS West in isolation, these have the potential to be of **minor** adverse significance. No further mitigation measures are proposed.

22.6.1.4.5 Significance of Effect – DBS East or DBS West Together

279. The potential significance of effect for indirect physical impacts to deposits of geoarchaeological interest, without mitigation, is the same for DBS East and DBS West as for DBS East or DBS West in isolation (i.e. any indirect physical impacts have the potential to be of **moderate** adverse significance).

280. The potential significance of effect for indirect physical impacts to non-designated heritage assets from vibration effect, without mitigation, is the same for DBS East and DBS West as for DBS East or DBS West in isolation (i.e. any indirect physical impacts have the potential to be of **minor** adverse significance and no further mitigation is proposed).

22.6.1.4.6 Mitigation and Residual Significance of Effect – DBS East or DBS West in Isolation

281. The potential for the project to encounter currently unrecorded geoarchaeological/palaeoenvironmental remains will be mitigated by means of implementing additional mitigation measures and commitments (set out in the project-specific **Outline Onshore WSI (Volume 8, application ref: 8.14)**), which will include reference to a project-wide approach to geoarchaeological assessment/palaeoenvironmental survey, which will be established in the post-consent stages.

282. With the application of mitigation through preservation by record, it is anticipated that there would be a negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms.

22.6.1.4.7 Mitigation and Residual Significance of Effect – DBS East and DBS West Together

283. The application of mitigation (as detailed above) will be the same for the construction of both DBS East and DBS West, as for either Project built in isolation. Therefore, with the application of mitigation through preservation by record, it is anticipated that there would be a negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms.

22.6.1.5 Impacts 5 and 6 Temporary Change to the Setting of Heritage Assets (Both Designated and Non-designated) Which Could Affect Their Heritage Significance

284. Activities undertaken as part of construction works for the Projects have the potential to impact designated and non-designated heritage assets through a temporary change in their setting which may affect their heritage significance. Temporary changes in the setting of heritage assets, should they occur, may do so for example through the presence of machinery, construction traffic and general construction activities taking place within and adjacent to the Onshore Development Area. The sight, sound, any dust created, and even smell, during the construction phase has the potential to temporarily change the setting of heritage assets and their associated heritage significance.

285. Impacts from lighting have been considered, as set out in the worst-case assessment (Table 22 1). During Construction, site lighting will only operate when required and will be positioned and directed to avoid unnecessary illumination to residential properties, sensitive ecological receptors, footpath users, and minimise glare to users of adjoining public highways (**Volume 8, Design and Access Statement, application ref: 8.8**). It is therefore considered that any impacts to the setting of designated heritage assets from lighting would be too infrequent and discontinuous to contribute to harm.

22.6.1.5.1 Magnitude of Impact – DBS East or DBS West in Isolation

286. The heritage settings assessment (**Volume 7, Appendix 22-5 Onshore Infrastructure Settings Assessment (application ref: 7.22.22.5)**) was informed by site visits to understand how the Projects would potentially change the setting of each asset and whether these changes would impact on the significance of the asset. The assessment concluded that only changes in setting due to the operation of the Projects would be of sufficient duration to merit more detailed assessment. Any changes in setting due to construction activities would be temporary and of sufficiently short duration that they would not give rise to material harm.

287. Any impact during construction, therefore, would be short term and reversible. It is therefore considered that any change to setting and associated heritage significance would result in a negligible adverse magnitude of impact, and no harm to significance would arise.

22.6.1.5.2 Magnitude of Impact – DBS East and DBS West Together

288. The duration of the construction phase of both DBS East and DBS West together represents a greater potential for changes to the setting of heritage assets than if, for example, only DBS East or DBS West were to be built in isolation. However, whilst there is a greater potential for changes to setting, the longer construction duration of building DBS East and DBS West Sequentially would not lead to an increase to the magnitude of impact for changes to setting and associated heritage significance as the impact remains temporary and reversible.

22.6.1.5.3 Sensitivity of Receptor

289. Initial review of the designated heritage assets located in proximity to the Onshore Development Area and therefore potentially susceptible to a temporary change to their setting include the following assets:

- Royal Observer Corps underground monitoring post and World War II visual spotting post (Scheduled Monument – NHLE 1021192);

- Hallgarth medieval hall and moat (Scheduled Monument – NHLE 1013705);
- Church of All Saints (Grade I Listed Building – NHLE 1083824);
- Skipsea Castle (Scheduled Monument – NHLE 1011212);
- Dunnington Conservation Area;
- Catfoss Hall (Grade II Listed Building – NHLE 1249759)
- Sigglesthorne Conservation Area;
- Church of All Saints (Grade II* Listed Building – NHLE 1160744);
- Eske medieval settlement and field system (Scheduled Monument – NHLE 1005216);
- Beverley sanctuary limit stone, Bishop Burton cross (Scheduled Monument – NHLE 1012589);
- Romano-British enclosure and two adjoining fields on Westwood Common (Scheduled Monument – NHLE 1013999);
- The Black Mill (Grade II Listed Building – NHLE 1310087);
- Heavy Anti-aircraft gunsite (Scheduled Monument – NHLE 1019186);
- Beverley sanctuary limit stone, Bentley cross (Scheduled Monument – NHLE 1012590);
- Old Hall (Grade II Listed Building – NHLE 1103420); and
- Low Hall (NHLE 1103419, 1310090, 1346992 – Grade II Listed Buildings).

290. These designated heritage assets have a medium to high level of importance and are shown on **Volume 7, Figure 22-3a-h (application ref: 7.22.1)**.

22.6.1.5.4 Significance of Effect – DBS East or DBS West in Isolation

291. In accordance with the significance of effect matrix (**Table 22-9**) without mitigation, should impacts occur from changes to setting within either DBS East or DBS West in isolation, these have the potential to be of **minor** adverse significance, as a worst case scenario.

22.6.1.5.5 Significance of Effect – DBS East and DBS West Together

292. The potential significance of effect from changes to heritage setting and associated heritage significance, without mitigation, is the same for DBS East and DBS West together (either built Sequentially or Concurrently) as for DBS East or DBS West in isolation (i.e. any change to setting has the potential to be of **minor** adverse significance, as a worst case scenario).

22.6.1.5.6 Mitigation and Residual Significance of Effect – DBS East or DBS West in Isolation

293. During construction the movement of construction traffic and machinery will be temporary and localised. Traffic management and movement of construction traffic and machinery will be managed through the CTMP. The removal of hedgerows and trees will be avoided where possible. On completion of construction, the Onshore Export Cable Corridor will be fully reinstated to its previous condition. No above-ground infrastructure will remain, other than inspection boxes for Link Boxes every 0.75 – 1.5km along the Onshore Export Cable Corridor. Hedgerows or trees will not be replanted directly over the buried cables. A landscape scheme will be developed to secure the restoration and, where possible, enhancement of the landscape post-construction.

294. During construction it is anticipated that there would be a temporary negligible adverse residual magnitude of impact, no harm to significance would arise. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to temporary **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms.

295. Once the landscape has been reinstated the magnitude of impact will be reduced from negligible to no change. Therefore, the residual effect will be **no change**.

22.6.1.5.7 Mitigation and Residual Significance of Effect – DBS East and DBS West Together

296. The application of mitigation (as detailed above) will be the same for the construction of both DBS East and DBS West, as for either Project built in isolation. During construction it is anticipated that there would be a temporary negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to temporary **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms.

297. Once the landscape has been reinstated the magnitude of impact will be reduced from negligible to no change. Therefore, the residual effect will be **no change**.

22.6.2 Potential Effects During Operation

298. During operation, it is expected that there will be no further requirement for land to be disturbed or excavated, except in the event that Onshore Export Cables require repair or maintenance. However, these activities would not extend beyond the construction footprint, and would be relatively rare and localised in occurrence. As such, no direct and indirect physical impacts to both designated and non-designated heritage assets during operation would arise.

299. The presence of permanent above ground onshore infrastructure could, however, have an effect on heritage significance as a result of change in the setting of heritage assets due to the presence of new, permanent above ground onshore infrastructure associated with the Projects being introduced to (and present within) the landscape.

300. Impacts from lighting have been considered, as set out in the worst-case assessment (Table 22 1). During Operation there would be no continuous / night-time lighting of the Onshore Convertor Station. Lighting during onshore operation and maintenance activities is expected to be minimal with most visits taking place in daylight hours (**Volume 7, Chapter 5 Project Description (application ref: 7.5)**. External lighting would be directional and limited to essential security and safety requirements. Furthermore, the landscaping proposals will, once established, provide further screening of any potential lighting effects. It is therefore considered that any impacts to the setting of designated heritage assets from lighting would be too infrequent and discontinuous to contribute to harm.

22.6.2.1 Impacts 7 and 8 Permanent Change to the Setting of Heritage Assets (Both Designated and Non-designated) Which Could Affect Their Heritage Significance

22.6.2.1.1 Magnitude of Impact – DBS East or DBS West in Isolation

301. The presence of permanent above ground infrastructure at the Onshore Substation Zone could have an ongoing impact on the setting of heritage assets for the duration of the operation phase as a result of its presence within the landscape and its day-to-day use.

302. The magnitude of impact upon one identified heritage asset (Heavy Anti-aircraft gunsite, 350m west of Butt Farm (NHLE 1019186 – Scheduled Monument) as a result of a change to its setting affecting its heritage significance could be **low** adverse, which is equivalent to less than substantial harm, as a worst case scenario.

303. The magnitude of impact on the following heritage assets as a result of change to their setting affecting their heritage significance could be negligible, which is a discernible change but one that does not cause harm:

- Square barrow on Westwood Common, 50m west of Blackmill (NHLE 1013996 – Scheduled Monument)
- Oval barrow on Westwood Common, 55m north-west of Blackmill (NHLE 1014000 – Scheduled Monument)
- Bowl barrow on Westwood Common, 150m north of Blackmill (NHLE 1013991 – Scheduled Monument)
- Square barrow on Westwood Common, 120m south of Blackmill (NHLE 1013995 – Scheduled Monument)
- Bowl barrow on Westwood Common, 50m north of Blackmill (NHLE 1013992 – Scheduled Monument)

304. As detailed in the full setting assessment in **Volume 7, Appendix 22-5 Onshore Infrastructure Settings Assessment (application ref: 7.22.22.5)** there would be no change in the setting of the remaining heritage assets identified as potentially being impacted by a change of setting, and no harm would arise.

22.6.2.1.2 Magnitude of Impact – DBS East and DBS West Sequentially

305. The operation of Onshore Converter Stations for both DBS East and DBS West together represents a greater potential for permanent changes to the setting of the identified heritage assets affecting their heritage significance than if, for example, only DBS East or DBS West were to be built in isolation. Also, the Sequential scenario will result in a slightly longer operational duration, due to the assumed two-year lag in construction between the two Projects. However, whilst there is a greater potential for changes to setting, the presence of two Onshore Converter Stations for DBS East and DBS West built Sequentially would not lead to an increase to the magnitude of impact on any of the identified heritage assets (as outlined above) for changes to setting and associated heritage significance as the impact.

22.6.2.1.3 Sensitivity of Receptor

306. The following heritage assets may be subject to a change in setting affecting their heritage significance, due to the presence of the Onshore Converter Stations and have been identified as requiring further assessment:

- Black Mill (NHLE 1310087 – Grade II Listed Building);

- Square barrow on Westwood Common, 50m west of Blackmill (NHLE 1013996 – Scheduled Monument);
- Oval barrow on Westwood Common, 55m north-west of Blackmill (NHLE 1014000 – Scheduled Monument);
- Bowl barrow on Westwood Common, 150m north of Blackmill (NHLE 1013991 – Scheduled Monument);
- Square barrow on Westwood Common, 120m south of Blackmill (NHLE 1013995 – Scheduled Monument);
- Bowl barrow on Westwood Common, 50m north of Blackmill (NHLE 1013992 – Scheduled Monument);
- Heavy Anti-aircraft gunsite, 350m west of Butt Farm (NHLE 1019186 – Scheduled Monument);
- Walkington Conservation Area;
- Beverley sanctuary limit stone, Walkington Cross (NHLE 1012591 – Scheduled Monument);
- Beverley sanctuary limit stone, Bentley Cross (NHLE 1012590 – Scheduled Monument);
- Bowl barrow 400m north of Highfield House (NHLE 1007731 – Scheduled Monument);
- The Minster Church of St John (Beverley Minster) (NHLE 1084028 – Grade I Listed Building);
- Risby Hall (NHLE 1001419 – Grade II Registered Park and Garden);
- Risby Jacobean gardens, hall and medieval settlement remains (NHLE 1018600 – Scheduled Monument);
- 'Cellar Heads' moated site and related ridge and furrow earthworks at Risby Park, 700m north-west of Risby Park Farm (NHLE 1015312 – Scheduled Monument);
- Old Hall (NHLE 1103420 – Grade II Listed Building); and
- Low Hall (NHLE 1103419, 1310090, 1346992 – Grade II Listed Buildings).

307. These heritage assets have a medium to high level of heritage importance and are shown on **Volume 7, Figure 22-3a-h (application ref: 7.22.1)**.

22.1.1.1.1 Significance of Effect – DBS East or DBS West In Isolation

308. The setting assessment has established that the tallest assets (namely Beverley Minster) and the assets that are adjacent or closest to the Onshore Substation Zone will likely have some varying visibility of the Onshore Substation Zone, which may to some extent affect their setting.

309. From Westwood Pasture, the Onshore Substation Zone will likely fall within the wider setting of Blackmill (1310087) and the Scheduled barrows (1013991, 1013992, 1013995, 1013996 and 1014000) with some varying visibility of the Substation Zone likely to be achievable. However, this is not considered likely to detract from their heritage significance or the ability to appreciate and experience the significance of these heritage assets:

- Square barrow on Westwood Common, 50m west of Blackmill (NHLE 1013996 – Scheduled Monument)
- Oval barrow on Westwood Common, 55m north-west of Blackmill (NHLE 1014000 – Scheduled Monument)
- Bowl barrow on Westwood Common, 150m north of Blackmill (NHLE 1013991 – Scheduled Monument)
- Square barrow on Westwood Common, 120m south of Blackmill (NHLE 1013995 – Scheduled Monument)
- Bowl barrow on Westwood Common, 50m north of Blackmill (NHLE 1013992 – Scheduled Monument)

310. The setting and associated heritage significance of the heavy Anti-aircraft Gunsite (1019186) is likely to be adversely affected by the location and presence of the Onshore Substation Zone. Its therefore judged that there will be moderate adverse effect upon the value of the heritage asset.

311. The heritage significance of Walkington Conservation Area derives predominantly from its historic and architectural interests, with the public open spaces within the village providing an area in which these aspects can be appreciated. The Onshore Substation Zone will sit within its wider landscape setting which is not considered to significantly contribute to the Conservation Area's heritage significance. There would be no change to the elements of the setting of the asset that contribute to its value, and consequently, the significance of the asset would remain unaffected.

312. The Beverley sanctuary limit stones at Walkington (1012591) and Bentley (1012590) are best appreciated and experienced from the roadside and an understanding of their historic connection with Beverley Minster. The Onshore Substation Zone will sit within the wider landscape, which is not

considered to directly contribute to these heritage assets' significance or the ability to appreciate and experience that significance.

313. There would be no change to the elements of the setting of the assets that contribute to its value, and consequently, the significance of the assets would remain unaffected.

314. The current setting and ability to appreciate the significance of the Scheduled bowl barrow at Hall Ings (1007731) is not considered to change to such an extent as to affect its heritage significance, which derives mainly from its archaeological interest and association with the other non-designated barrows. There would be no change to the elements of the setting of the asset that contribute to its value, and consequently, the significance of the asset would remain unaffected.

315. The setting and associated heritage significance of Beverley Minster (1084028) will not be affected from within Beverley itself, however, there is likely to be some change to its setting and associated heritage significance (including an appreciation of this element of significance) when viewed and experienced across and within the wider landscape. However, this is not considered to affect its heritage significance, which is derived largely from its architectural, archaeological, artistic and historic interests, as well as its immediate setting. There would be no change to the elements of the setting of the asset that contribute to its value, and consequently, the significance of the asset would remain unaffected.

316. The setting and associated heritage significance of Risby Hall Registered Park and Garden (1001419) and Risby Hall (1018600) is unlikely to change from within the grounds themselves, however, some change to the wider setting of the Registered Park and Garden is likely to be experienced from the northern and eastern perimeters of the park where views of the Onshore Substation Zone are likely to be achievable. It is not considered however, that this intrusion will impact on the elements of the setting which contribute to the park and gardens value (such as the designed views within the park itself and to the south and east). There would be no change to the elements of the setting of the asset that contribute to its value, and consequently, the significance of the asset would remain unaffected.

317. There is judged to be no change to the setting of Old Hall (1103420) and associated heritage assets as a result of the Onshore Substation Zone.

318. Following the detailed setting assessment (**Volume 7, Appendix 22-5 Onshore Infrastructure Settings Assessment (application ref: 7.22.22.5)**) it was concluded that only one asset, the Heavy Anti-aircraft gunsite, 350m west of Butt Farm (NHLE 1019186 – Scheduled Monument) of high

importance would be subject to any significant effects (low adverse magnitude of impact, which is equivalent to a low magnitude of less than substantial harm). In accordance with the significance of effect matrix (**Table 22-9**) without mitigation, should impacts occur from changes to setting within either DBS East or DBS West in isolation, these have the potential to be of **moderate** adverse significance in relation to the Heavy Anti-aircraft gunsite, as a worst case scenario.

22.6.2.1.4 Significance of Effect – DBS East and DBS West Sequentially

319. The potential significance of effect from changes to heritage setting and associated heritage significance, without mitigation, is the same for DBS East and DBS West as for DBS East or DBS West build Sequentially. As such any impact on the setting of the Heavy Anti-aircraft gunsite, 350m west of Butt Farm (NHLE 1019186 – Scheduled Monument) of high importance, would be subject to a low adverse magnitude of impact (which is equivalent to a low magnitude of less than substantial harm) resulting in a **moderate** adverse significance, as a worst case scenario.

22.6.2.1.5 Mitigation and Residual Significance of Effect – DBS East or DBS West In Isolation

320. The Onshore Converter Station will be designed to reduce the overall height and massing of associated structures and other elements as far as possible. Landscape proposals will include measures for the enhancement of the landscape during the operational phase of the onshore substation. This will include landscape screening of the onshore substation such as hedgerow and woodland planting. Once matured, this will help to integrate the Onshore Converter Station into the existing landscape of arable fields and boundary trees/hedgerows. The aforementioned planting would be secured through the approval of a detailed landscape management plan post-consent. Further detail on the principles of mitigation are set out in **Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23)**.

321. Screening along the northern and southern boundaries of the Onshore Substation Zone will likely reduce the magnitude of impact (shown in **Volume 7, Figure 23-6 (application ref: 7.23.1)**).

322. Following the application of appropriate and proportionate mitigation approaches there would be a negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**), the residual significance of effect would be reduced to **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms.

22.6.2.1.6 Mitigation and Residual Significance of Effect – DBS East and DBS West Sequentially

323. The application of mitigation (as detailed above) will be the same for the operation of both DBS East and DBS West Sequentially, as for either Project built in isolation. Following the application of appropriate and proportionate mitigation approaches there would be a negligible adverse residual magnitude of impact. In accordance with the significance of effect matrix (**Table 22-9**Table 22-9**)**, the residual significance of effect would be reduced to **minor adverse** as a worst-case scenario, which would be considered not significant in EIA terms.

22.6.3 Potential Effects During Decommissioning

324. No decision has been made regarding the final decommissioning policy for the Onshore Export Cables, as it is recognised that industry best practice, rules and legislation change over time. It is likely that the cables would be pulled through the ducts and removed, with the ducts themselves left in situ.

325. In relation to the Onshore Converter Stations, the programme for decommissioning is expected to be similar in duration to the construction phase. The detailed activities and methodology would be determined later within the project lifetime. Any such methodology and associated mitigation would be agreed with the relevant authorities and statutory consultees through a decommissioning plan in accordance with the requirements of the **Draft DCO (Volume 3, application ref: 3.1)**.

326. Assuming that provision is made for methods of removal which minimise further impact to the wider area, it is reasonable to assume that any potential damage upon designated and non-designated heritage assets would have already occurred as part of construction activities. However, it is noted that the demolition of buildings and infrastructure can have an impact greater than that of construction e.g. if grubbing out of foundations or remediation of contaminants is required. As such, the worst case scenario regarding decommissioning cannot be ascertained until the Decommissioning Plan is finalised.

327. Changes to setting may be present due to visual and audible impacts associated with decommissioning activities. Any changes to the setting of heritage assets are considered to be temporary in duration, occurring in association with the decommissioning phase. As such, the worst case scenario as outlined for the construction phase in relation to temporary changes to the setting of heritage assets is unlikely to be exceeded due to decommissioning activities.

22.7 Potential Monitoring Requirements

328. Monitoring requirements for onshore archaeology and cultural heritage are described in the **Outline Onshore WSI (Volume 8, application ref: 8.14)**) submitted alongside the DCO application and would be further developed and agreed with stakeholders prior to construction and taking account of the final detailed design of the Projects, as secured in DCO Requirement 18.

329. Direct (physical) impacts would be offset or reduced through either preservation *in situ* or archaeological fieldwork and reporting, undertaken by professional archaeologists and monitored by Humber Archaeology Partnership on behalf of East Riding of Yorkshire Council.

22.8 Cumulative Effects Assessment

330. Cumulative effects can be defined as incremental effects on that same receptor from other proposed and reasonably foreseeable schemes and developments in combination with the Projects. This includes all schemes that result in a comparative effect that is not intrinsically considered as part of the existing environment and is not limited to offshore wind projects.

331. The overarching method followed in identifying and assessing potential cumulative effects is set out in **Volume 7, Chapter 6 EIA Methodology (application ref: 7.6)** and **Volume 7, Appendix 6-1 Onshore Cumulative Effects Assessment Methodology (application ref: 7.6.6.1)**. The approach is based upon the Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (PINS 2017). The approach to the CEA is intended to be specific to DBS Projects and takes account of the available knowledge or the environment and other activities around the Onshore Development Area.

332. As detailed in section 22.4.5, this section presents an assessment of cumulative effects in relation to onshore archaeology and cultural heritage.

333. The CEA has followed a four-stage approach developed from the Planning Inspectorate Advice Note Seventeen. These stages are set out in **Table 1-2** of **Volume 7, Appendix 6-1 Onshore Cumulative Effects Assessment Methodology (application ref: 7.6.6.1)**. Stage four of this process, the CEA assessment is undertaken in two stages.

334. The first step in the CEA is the identification of which residual impacts assessed for the Projects on their own have the potential for a cumulative impact with other schemes, plans, projects and activities. This information is set out in **Table 22-13** which sets out the potential impacts assessed in this chapter and identifies the potential for cumulative effects to arise, providing a rationale for such determinations. Only potential impacts assessed as negligible or above are included in the CEA. Those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact.

Table 22-13 Potential Cumulative Impacts

Potential Impact	Potential for Cumulative Effect	Data Confidence	Justification
Construction			
Impact 1: Direct Physical Impact on Designated Heritage Assets	No	High	There is no potential for cumulative direct effects as no direct physical impacts are anticipated to occur to designated heritage assets.
Impact 2: Direct Physical Impact on Non-designated Heritage Assets	Yes	High	Cumulative direct effects arising from two or more projects are possible given the level of uncertainty regarding the nature and extent of the potential archaeological resource. Impacts may occur to individual archaeological features (buried or above ground) in an area of overlap or those with an extent which intersects two or more proposed project boundaries (where groundworks are anticipated). Effects may occur which affect the nature of the archaeological resource on a wider scale. Such effects also have the potential to affect the HLC of the study area (e.g., loss of earthworks as a result of one project could affect the HLC as summarised for the purposes of another project).

Potential Impact	Potential for Cumulative Effect	Data Confidence	Justification
Impacts 3 and 4: Indirect Physical Impact on Designated and Non-designated Heritage Assets	Yes	High	Cumulative direct effects arising from two or more projects are possible in an area of overlap or those with an extent which intersects two or more proposed project boundaries (where groundworks are anticipated).
Impacts 5 and 6: Temporary Change to the Setting of Heritage Assets Which Could Affect Their Heritage Significance	Yes	High	Cumulative changes in heritage setting arising from two or more projects are possible, particularly in the event that the construction of two or more projects is Concurrent and within sight of an individual heritage asset, although additional factors affecting setting may also occur.
Operation & Maintenance			
Impacts 7 and 8: Permanent Change to the Setting of Heritage Assets Which Could Affect Their Heritage Significance	Yes	High	Cumulative changes in heritage setting arising from two or more projects are possible, particularly in the event that the infrastructure of two or more projects occurs within sight of an individual heritage asset, although additional factors affecting setting may also occur.
Decommissioning			
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, cumulative effects during the decommissioning phase are assumed to be the same as those identified during the construction phase.			

335. The second stage of the CEA is a project specific assessment of the potential for any significant cumulative effects to arise due to the construction and/or operation and maintenance of the Projects. To do this, a short list of schemes for CEA has been produced relevant to onshore archaeology and cultural heritage following the approach outlined in **Volume 7, Appendix 6-1 Onshore Cumulative Effects Assessment Methodology (application ref: 7.6.6.1)**. The second stage of this assessment is only undertaken if the first stage identifies that cumulative effects are possible.

336. The CEA has been based on information available on each potential scheme (e.g. as set out on the East Riding of Yorkshire Council and Hull City Council planning portal as well as the Planning Inspectorate website) as of January 2024. It is noted that the other scheme details available may change in the period up to construction or may not be available in detail at all. The assessment presented here is therefore considered to be conservative, with the level of impacts expected to be reduced compared to those presented here.

337. A total of 11 schemes have been identified for inclusion on the short list of projects to be assessed cumulatively for onshore archaeology and cultural heritage. Schemes that have not been considered as resulting in likely cumulative significant effects for onshore archaeology and cultural heritage are as a result of the distance to the Projects, spatial coverage, scale and form of the CEA schemes.

338. Summary information on the short list schemes progressing through this exercise (i.e. the short list of other schemes) for assessment on onshore archaeology and cultural heritage is provided below in **Table 22-14**. This presents the scenarios whereby the Projects and the other schemes/developments that have been identified on the short list of schemes screened for onshore archaeology and cultural heritage, as listed in **Table 22-14**, could potentially result in cumulative effects for onshore archaeology and cultural heritage.

Table 22-14 Short List of Schemes Considered Within the Onshore Archaeology and Cultural Heritage Cumulative Effects Assessment

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Dogger Bank A & B	1	Due to the nature and scale of the development there is the potential for the onshore elements of the Dogger Bank A & B schemes to have direct and/or indirect cumulative effects on heritage assets through a direct impact on the shared archaeological resource and potential for indirect effects on heritage assets through a change in their setting. However, this is expected to be limited due to the archaeological mitigation measures in place for the scheme.	No potential for significant cumulative effects.
A164 and Jocks Lodge Junction Improvement Scheme	1	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to the scale of this development resulting in no impact greater than that of the Projects as assessed individually as part of this chapter.	No potential for significant cumulative effects.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Creyke Beck Solar Farm	1	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to the scale of this development which would resulting in a combination of impacts to result in a significant cumulative effect.	No potential for significant cumulative effects.
Tickton Bridge Solar	1	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to limited receptors in this area.	No potential for significant cumulative effects.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Hornsea 4 Offshore Wind Farm	1	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to archaeological mitigation measures in place for the Scheme.	No potential for significant cumulative effects.
JBM Peartree Hill Solar Farm	2	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to archaeological mitigation measures in place for the scheme.	No potential for significant cumulative effects.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
Scotland England Green Link 2 (SEGL2)	2	Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to the distance of this CEA scheme from the Projects. This would provide no pathway fora combination of impacts to result in a significant cumulative effect.	No potential for significant cumulative effects.
Proposed Beverley Household Recycling Centre[1]	3	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to limited receptors in this area.	No potential for significant cumulative effects.
Proposed Birkhill Wood National Grid Substation	2	Due to the scheme crossing the Onshore Development Area there is the potential for cumulative effects of a direct and/or indirect nature to heritage assets. The impact to archaeological resource will have been mitigated through	No potential for significant cumulative effects.

[1] The Applicants are aware that the Proposed Beverley Household Recycling Centre application has been refused however kept in CEA longlist due to professional judgement and stakeholder request.

Scheme Name	Tier	Discussion	Likelihood and Significance of Cumulative Effects
		appropriate archaeological mitigation. Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to limited receptors in this area.	
North Humber to High Marnham Grid Upgrade	2	Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to the scale of this development. This would provide no pathway for a combination of impacts to result in a significant cumulative effect.	No potential for significant cumulative effects.
Creyke Beck Substation Extension	2	Indirect impacts to the setting of designated and non-designated heritage assets are not considered to be a significant concern, due to limited receptors in this area.	No potential for significant cumulative effects.

339. The CEA for onshore archaeology and cultural heritage has not identified any schemes where significant cumulative effects could arise.

22.9 Interactions

340. The effects identified and assessed in this chapter have the potential to interact with each other. The areas of potential interaction between effects are presented in **Table 22-15**. This provides a screening tool for which effects have the potential to interact. **Table 22-16** provides an assessment for each receptor (or receptor group) as related to these impacts.

341. Within **Table 22-16** the effects are assessed relative to each development phase to see if multiple effects could increase the significance of the effect upon a receptor. Following this a lifetime assessment is undertaken which considers the potential for effect to affect receptors across all development phases.

Table 22-15 Interactions Between Impacts - Screening

Potential Interactions between Impacts						
Construction						
	Impact 1: Direct Physical Impact on Designated Heritage Assets	Impact 2: Direct Impact on Non-designated Heritage Assets	Impact 3: Indirect Physical Impact on Designated Heritage Assets	Impact 4: Indirect Physical Impact on Non-designated Heritage Assets	Impact 5: Temporary Change to the Setting of Designated Heritage Assets	Impact 6: Temporary Change to the Setting of Non-designated Heritage Assets
Impact 1: Direct Physical Impact on Designated Heritage Assets		No	No	No	No	No
Impact 2: Direct Impact on Non-designated Heritage Assets	No		No	Yes	No	Yes
Impact 3: Indirect Physical Impact on Designated Heritage Assets	No	No		No	Yes	No
Impact 4: Indirect Physical Impact on Non-designated Heritage Assets	No	Yes	No		No	Yes
Impact 5: Temporary Change to the Setting of Designated Heritage Assets	No	No	Yes	No		No
Impact 6: Temporary Change to the Setting of Non-designated Heritage Assets	No	Yes	No	Yes	No	

Potential Interactions between Impacts				
Operation				
	Impact 7: Permanent Change to the Setting of Designated Heritage Assets	Impact 8: Permanent Change to the Setting of Non-designated Heritage Assets	Impact 3: Indirect Physical Impact on Designated Heritage Assets	Impact 4: Indirect Physical Impact on Non-designated Heritage Assets
Impact 7: Permanent Change to the Setting of Designated Heritage Assets		No	Yes	No
Impact 8: Permanent Change to the Setting of Non-designated Heritage Assets	No		No	Yes
Impact 3: Indirect Physical Impact on Designated Heritage Assets	Yes	No		No
Impact 4: Indirect Physical Impact on Non-designated Heritage Assets	No	Yes	No	
Decommissioning				
It is anticipated that the decommissioning impacts would be similar in nature to those of construction.				

Table 22-16 Inter-relationship Between Impacts – Phase and Lifetime Assessment

Receptor	Highest Significance Level				
	Construction	**Operation**	**Decommissioning**	**Phase Assessment**	**Lifetime Assessment**
Designated Heritage Assets	No impact	Minor adverse	No impact	No greater than individually assessed impact. Mitigation (avoidance, micro-siting and route refinement) will minimise or remove the potential for indirect physical impacts on designated heritage assets during construction. There would be no direct or indirect physical disturbance during operation. Setting is not relevant to the construction and decommissioning phases as any change will be temporary. It is therefore considered that there will be no pathway for interaction to exacerbate the potential impacts associated with these activities during or between any of the Projects' phases.	No greater than individually assessed impact. Infrastructure is only installed during construction, therefore there is no greater footprint taken as part of the operational or decommissioning phases. Setting is not relevant to the construction and decommissioning phases as any change will be temporary. It is therefore considered that over the Projects' lifetime these impacts would not combine to increase the significance level of any impacts identified in this assessment.
Non-designated Heritage Assets	Minor adverse	Minor adverse	Minor adverse	No greater than individually assessed impact. Mitigation will minimise or offset the potential for direct physical and indirect physical impacts on non-designated heritage assets during construction. There would be no direct or indirect physical disturbance during operation. Setting is not relevant to the construction and decommissioning phases as any change will be temporary. It is therefore considered that there will be no pathway for interaction to exacerbate the potential impacts associated with these activities during or between any of the Projects' phases.	No greater than individually assessed impact. Infrastructure is only installed during construction, therefore there is no greater footprint taken as part of the operational or decommissioning phases. Setting is not relevant to the construction and decommissioning phases as any change will be temporary. It is therefore considered that over the Projects' lifetime these impacts would not combine to increase the significance level of any impacts identified in this assessment.

22.10 Inter-relationships

342. For onshore archaeology and cultural heritage potential inter-relationships between other topics assessed within the ES including onshore archaeology and cultural heritage. A summary of the potential inter-relationships is provided in **Table 22-17**.

Table 22-17 Onshore Archaeology and Cultural Heritage Inter-relationships

Impact / Receptor	Related Chapter	Where Addressed in this Chapter	Rationale
Construction			
Impacts 1 and 2	No inter-relationships identified		
Impacts 3 and 4: Indirect (physical) impacts on designated and non-designated heritage assets.	**Volume 7, Chapter 20 Flood Risk and Hydrology (application ref: 7.20)**	Section 22.6.1.4	Potential impacts as a result of changes to ground conditions affecting buried archaeological deposits.
	Volume 7, Chapter 19 Geology and Land Quality (application ref: 7.19)	Section 22.6.1.2	Potential impacts as a result of changes to ground conditions affecting buried archaeological and geoarchaeological deposits such as the Skipsea Drain LoGS.
	Volume 7, Chapter 25 Noise (application ref: 7.25)	Section 22.6.1.3	Potential for vibration from groundworks affecting the fabric of a heritage asset.
Impacts 5 and 6: Temporary change to the setting of heritage assets.	**Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23)**	Section 22.6.1.5	There could be potential impacts with respect to landscape and visual receptors which could also represent potential changes to the setting of heritage assets.

Impact / Receptor	Related Chapter	Where Addressed in this Chapter	Rationale
	Volume 7, Chapter 24 Traffic and Transport (application ref: 7.24)	Section 22.6.1.5	Potential impacts related to the presence of construction traffic and machinery could change the setting of heritage assets.
	Volume 7, Chapter 25 Noise (application ref: 7.25)	Section 22.6.1.5	Potential impacts related to noise and vibration could change the setting of heritage assets.
	Volume 7, Chapter 26 Air Quality (application ref: 7.26)	Section 22.6.1.5	Potential impacts from dust could change the setting of heritage assets.
Operation			
Impacts 7 and 8: Permanent change to the setting of heritage assets.	**Volume 7, Chapter 23 Landscape and Visual Impact Assessment (application ref: 7.23)**	Section 22.6.2.1	There could be potential impacts with respect to visual receptors at the Onshore Substation Zone which could also represent potential changes to the setting of heritage assets.
	Volume 7, Chapter 29 Tourism and Recreation (application ref. 7.29)	Section 22.6.2	Effects on Butt Farm campsite are considered in Chapter 29. The change in setting of heritage assets within the vicinity could affect the desirability of tourist attractions / visitor sites.

Impact / Receptor	Related Chapter	Where Addressed in this Chapter	Rationale
	Volume 7, Chapter 25 Noise (application ref: 7.25)	Section 22.6.2.1	Potential impacts related to noise and vibration could change the setting of heritage assets.
Decommissioning			
Inter-relationships and the identified impacts associated with the decommissioning phase would be no greater than those identified for the construction phase.			

22.11 Summary

343. This chapter has provided a characterisation of the existing environment for onshore archaeology and cultural heritage based on both existing and site specific survey data. This assessment has established that there would be some minor adverse residual effects on heritage assets during construction, operation and decommissioning phases of the Projects.

344. A summary of the findings of this chapter for onshore archaeology and cultural heritage is presented in **Table 22-18**.

345. In accordance with the assessment methodology presented in section 22.4.3, this table should also be used in conjunction with the additional narrative explanations provided in section 22.6.

346. The impact assessment as presented in this chapter assumes that activities associated with construction may theoretically occur anywhere within the Onshore Development Area.

Table 22-18 Summary of Potential Likely Significant Effects on Onshore Archaeology and Cultural Heritage

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Construction						
Impact 1: Direct physical impact on designated heritage assets	Known designated heritage assets.	Medium - High	No impact	N/A	N/A	N/A
Impact 2: Direct physical impact on non-designated heritage assets	Known and potential buried archaeological and geoarchaeological / palaeoenvironmental remains and above ground heritage assets.	Low - High	High Adverse	Moderate - Major Adverse	Further advance and enacting of preservation *in situ* options and requirements (e.g. avoidance/micro-siting/HDD etc., where possible). Application of mitigation through preservation by record, which could include: • Archaeological excavation: including subsequent post-excavation assessment, and analysis, publication and archiving; • Archaeological monitoring/watching brief: including subsequent post-excavation assessment, and analysis, publication and archiving (where appropriate); and • Earthwork condition surveys: including subsequent reporting and archiving (followed by backfilling and reinstatement, where required on a case-by-case basis).	Following the application of appropriate and proportionate evaluation and mitigation approaches, to be agreed in consultation with the ETG, the residual impact is anticipated to be reduced (or offset) to an impact significance level of **minor** adverse, as a worst case scenario.

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Impact 3: Indirect physical impact on designated heritage assets	Deposits associated with designated heritage assets. Vibration affecting designated heritage assets.	Medium - High	No impact	N/A	N/A	N/A
Impact 4: Indirect physical impact on non-designated heritage assets	Known palaeoenvironmental and geoarchaeological deposits.	Low – Medium	Medium Adverse	Moderate Adverse	The Projects will include a programme of Geoarchaeological / Palaeoenvironmental surveys to inform any mitigation requirements, as secured in DCO Requirement 18.	Following the application of appropriate and proportionate mitigation approaches the residual impact is anticipated to be reduced (or offset) to an impact significance level of **minor** adverse as a worst case scenario.
	Vibration affecting non-designated heritage assets.	Low - High	Negligible	Minor Adverse	N/A	
Impact 5: Temporary change to the setting of designated heritage assets	Known designated heritage assets.	Medium - High	Anticipated to be Negligible Adverse as a worst case scenario	Minor Adverse as a worst case scenario	Traffic management and movement of construction traffic and machinery will be temporary and localised, and managed through the CTMP, as secured in DCO Requirement 14. A landscape scheme will be developed to secure the restoration and, where possible, enhancement of the landscape post-construction. An **Outline Landscape Management Plan (Volume 8, application ref: 8.11)** is provided, as secured in DCO Requirement 10.	Residual impact is anticipated to be reduced to temporary **negligible** adverse, as a worst case scenario, following the application of appropriate and proportionate mitigation.

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Impact 6: Temporary change to the setting of non-designated heritage assets	Known non-designated above ground heritage assets.	Low - High	No impact	N/A	N/A	N/A
Operation						
Impact 7: Permanent change to the setting of designated heritage assets	Known designated heritage assets.	Medium - High	Anticipated to be Low Adverse as a worst case scenario	Moderate Adverse as a worst case scenario	The Onshore Converter Station(s) will be designed to reduce the overall height and massing of associated structures and other elements as far as possible. Landscape proposals will include measures for the enhancement of the landscape during the operational phase of the onshore substation. This will include landscape screening of the onshore substation such as hedgerow and woodland planting, as secured in DCO Requirements 9 and 10.	Residual impact is anticipated to be reduced to **minor** adverse, as a worst case scenario, following the application of appropriate and proportionate mitigation approaches.
Impact 8: Permanent change to the setting of non-designated heritage assets	Known non-designated above ground heritage assets.	Low - High	No impact	N/A	N/A	N/A
Decommissioning						
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A Decommissioning Plan would be provided prior to any decommissioning commencing onshore.						

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