



Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Volume 2, Chapter 9: Marine and Intertidal
Archaeology

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MSDS Marine	Morven Offshore Wind Limited

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Annexes

Annex number	Annex title
Volume 2, Annex 9.1	Marine and Intertidal Archaeology Technical Report

Glossary

Term	Meaning
the Applicant	The legal entity making the applications for consent; Morven Offshore Wind Limited (MvOWL).
Amplitude (as it relates to sound)	Amplitude is defined as the maximum height of a sound wave, representing the extent of particle displacement as the wave travels through a medium. In simpler terms, it can be thought of as the "height" of the wave. Greater amplitude means that particles are displaced further from their equilibrium position, resulting in a louder sound.
Anomaly	An anomaly is a local variation of an otherwise uniform signal response. In the context of marine geophysics, the word anomaly is often used to indicate the feature causing the variation as well as the variation itself
Anthropogenic	An activity caused or produced by humans.
Archaeological Exclusion Zone (AEZ)	An area surrounding any features or geophysical anomalies of known or potential archaeological interest within which no activity may occur which may act as a potential pathway for impacts to marine archaeology receptors.
Archaeological Interest	A heritage asset with value from the potential to hold evidence about the past that can be retrieved through specialist investigation.
Archaeological remains	The material remains of human activity from the earliest persons of human evolution to present. These may be buried traces of human activities, sites visible above ground, or moveable artifacts.
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
Bathymetry	The measurement of water depth in oceans, seas and lakes.
Cable protection	Measures used to protect subsea cables where burial is not possible, due to seabed conditions or at cable crossings, to ensure cable stability and reduce risks from anchors, fishing gear and environmental forces.
Climate change	A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.
Commercial fishing	Any form of fishing activity legally undertaken where the catch is sold for taxable profit.
Commitments	Measures (embedded mitigation and secondary) to be adopted during the construction, operation and maintenance and decommissioning phases of the MHPGC Project.
Conservation Area	An area of special architectural or historic interest, the character, appearance or setting of which it is desirable to preserve or enhance.
Coverage	The extent of the seabed covered by a particular survey, usually expressed as a percentage. If lines overlap, this percentage can be more than 100% (so 200% means that the entire survey area is covered at least twice).
Cumulative effect	The combined effect of the MHPGC Project in combined with the effects from other proposed developments, on the same receptor or resource.
Cumulative assessment effects	Assessment of the likely effects arising from the MHPGC Project alongside the likely effects arising from other proposed developments on the same receptor or resource.

Term	Meaning
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Desk-based assessment	A desk-based research method used to collect and analyse existing information, including the review of literature, previous survey reports, databases and maps to inform the baseline environment and the need for further surveys.
Desk study	A desk-based research method used to collect and analyse existing information, including the review of literature, previous survey reports, databases and maps to inform the baseline environment and the need for further surveys.
Designated Heritage Asset	Heritage assets designated nationally under the relevant legislation. Planning Practice Guidance paragraph 022 identifies designated heritage assets as including scheduled monuments, listed buildings, registered parks and gardens, registered battlefields, world heritage sites, conservation areas and protected wreck sites.
Development Consent Order (DCO)	An order made under the Planning Act 2008, as amended, granting development consent.
Draft Development Consent Order and deemed Marine Licences	The draft order submitted by the Applicant to the Planning Inspectorate (PINS) as part of its application for development consent under the Planning Act 2008, including any deemed Marine Licence(s) in English Waters.
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 importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
Embedded mitigation	Measures included as part of the project design. Includes both primary and tertiary mitigation.
Environment Agency (EA)	The EA is the public body responsible for protecting and improving the environment in England, including regulating activities that affect land, water, and biodiversity. For a DCO, the EA acts as a statutory consultee, advising on flood risk, water quality and ecological impacts.
Environmental Impact Assessment (EIA)	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Expert Working Groups (EWGs)	A topic-specific group of specialists formed under the evidence plan process (EPP) to resolve technical issues and agree approaches for environmental assessments.
Fluvial	Sediments that are transported and deposited by rivers.
Future baseline	Refers to the predicted situation in future years without the MHPGC Project.
Gazetteer	A directory providing information on historical assets relevant to a project.
Geoarchaeological potential	Some deep natural or semi-natural deposits have the capacity to preserve deeply buried archaeological or environmental material, including organic materials that are rarely preserved. Such deposits can be said to have high geoarchaeological potential.
Geology	The study of the rocks and similar substances that make up the earth's surface.

Term	Meaning
Glaciolacustrine	Sediments deposited into lakes that have come from glaciers are called glaciolacustrine deposits. These lakes include ice margin lakes or other types formed from glacial erosion or deposition. Sediments in the bedload and suspended load are carried into lakes and deposited.
Glaciomarine	An environment containing both glacial ice and marine water.
Greenhouse gas	A gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse impact. Examples include carbon dioxide and methane.
High Voltage Alternating Current (HVAC)	A HVAC electric power transmission system uses alternating current for electric power transmission that periodically reverses direction at regular intervals.
High Voltage Direct Current (HVDC)	A HVDC electric power transmission system uses direct current for electric power transmission, in contrast to the more common alternating current systems. Most HVDC links use voltages between 100 kilovolts (kV) and 800kV.
Historic England (HE)	HE is the Government's statutory adviser on England's historic environment and an executive non-departmental public body. In the DCO process, HE acts as a statutory consultee, providing expert advice on the potential effects of development on the historic environment. This includes designated heritage assets such as listed buildings, scheduled monuments, protected wreck sites, registered parks and gardens, conservation areas and World Heritage Sites. HE also advises on undesignated heritage assets, including archaeological remains, and on the setting and significance of heritage assets. In addition, HE provides specialist advice on coastal, intertidal and offshore marine archaeology, including submerged landscapes, shipwrecks and other marine heritage assets.
Impact	A change caused by an action that occurs during a project's lifetime.
Inshore waters	Marine waters from mean high water springs extending seaward to 12 nautical miles (nm).
Intertidal area	The area between Mean High Water Springs (MHWS) and the Mean Low Water Springs (MLWS).
Lacustrine	Sediments formed at the bottom of lakes by incoming water from rivers or stream.
Landfall	The area in which the offshore export cables make landfall (come onshore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area between the trenchless technique exit pits and the transition joint bay inclusive of all construction works.
Likely Significant Effect	Effects from the Proposed Development that have a pathway for effect to the National site that could affect the conservation objectives for the site's qualifying features. If the proposed development 'would be likely to have significant effect on a 'National site' as per the Habitat Regulations, then then an appropriate assessment of the plan or project must be carried out by the Competent Authority.
Local Authority	The Local Authority is a body empowered by law to exercise various statutory functions for a particular geographic area of the United Kingdom. This includes District Councils and County Borough Councils. For a DCO, the Local Authority acts as a statutory consultee, advising on local planning matters, environmental impacts and compliance with relevant policies and community considerations.

Term	Meaning
Local planning authority (LPA)	The local government body responsible for determining planning applications within a specific area.
Lowest Astronomical Tide (LAT)	The lowest tide level that can be expected to occur under average meteorological conditions and under any combination of astronomical conditions.
Magnetic anomaly	A notable localised variation in the earth's magnetic field.
Magnetometer	An instrument which measures the strength of a magnetic field.
Marine Directorate Licensing Operations Team (MD-LOT)	The part of the Scottish Government's Marine Directorate responsible for assessing and administering applications for marine licences and Section 36 consent (offshore) in Scotland.
Marine Licence	A marine licence permits the undertaking of different activities in the marine environment, including construction, the deposition or removal of substances or objects from the seabed and dredging. The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities within the Scottish offshore region (12nm – 200nm) and in English offshore and inshore regions (noting that deemed marine licences will be included within the Development Consent Order application).
Marine Management Organisation (MMO)	The MMO, as a UK government body, is responsible for licensing, regulating and overseeing activities in the marine environment for English waters. For a DCO and deemed marine licence, the MMO acts as a statutory consultee, advising on marine planning, environmental impacts, habitats and compliance with marine licensing regulations.
Mean High Water Springs (MHWS)	The most inshore level location reached by the sea at high tide during mean high water spring tide. This is defined as the average tidal height throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
Mean Low Water Springs (MLWS)	The average height of the low water levels of each pair of successive low waters during the periods of about 24 hours when the tidal range is at its greatest.
Maximum Design Scenario (MDS)	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the MHPGC Project.
MHPGC Project Environmental Statement (ES)	The document presenting the results of the Environmental Impact Assessment process.
MHPGC Project Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach to, and information to support, the EIA and Habitats Regulations Assessment processes for certain topics.
MHPGC Project PEIR Red Line Boundary	The area within which all components of the MHPGC Project will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds).
MHPGC Project Preliminary Environmental Information Report (PEIR)	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
MHPGC Project Scoping Boundary	The spatial extent of the area used to define the environmental baseline to inform impact assessments at the time the MHPGC Project Scoping Report was submitted.

Term	Meaning
MHPGC Project Scoping Opinions	Separate scoping opinions received from PINS (on behalf of the Secretary of State) and MD-LOT (on behalf of the Scottish Ministers) in response to the MHPGC Project Scoping Report. The MHPGC Project Scoping Opinions contain the range of issues that PINS, and MD-LOT in consultation with statutory stakeholders, have identified should be considered within the EIA process.
MHPGC Project Scoping Report	A Scoping Report for the MHPGC Project, scoping the likely significant effects of the project on the environment, was submitted and accepted by Planning Inspectorate (PINS) and submitted to the Scottish Ministers, via the Marine Directorate – Licencing Operations Team (MD-LOT) in February 2025.
Morven Branxton Area Grid Connection Project (hereafter 'MBAGC Project')	The Morven Branxton Area Grid Connection Project will be comprised of the offshore export cable in Scottish waters from the Morven North or the Morven South Offshore Substation Platforms, the onshore export cable and the onshore land substation in the vicinity of Branxton in East Lothian, Scotland.
Morven Hawthorn Pit Grid Connection Project (hereafter MHPGC Project)	The MHPGC Project is comprised of the offshore export cables in Scottish and English waters from the Morven North or the Morven South offshore substation platform(s) (OSP), landfall, onshore export cables, the onshore land substation (LSS) and AC connection cables. Also referred to in this report as the MHPGC Project, for ease of reading.
Morven North Offshore Wind Array Project and Morven South Offshore Wind Array Project (hereafter Morven North and Morven South)	Morven North and Morven South comprises the Morven North Offshore Wind Array Project and Morven South Offshore Wind Array Project, collectively.
Morven Programme	The Morven Programme comprises the MHPGC Project, Morven North, Morven South and MBAGC Project collectively.
Morven South Boundary	Boundary within which the wind turbines foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure for Morven South will be located.
Morven South Offshore Wind Array Project	The Morven South Offshore Wind Array Project, which includes the wind turbines and foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure located within the Morven South Boundary.
Multibeam Echo Sounder (MBES)	An instrument that uses sound to create a three-dimensional map of the seabed bathymetry.
National Planning Policy Framework (NPPF)	The NPPF sets out the core planning principles for England. It provides a framework within which locally-prepared plans can provide for housing and other development in a sustainable manner.
National Policy Statement (NPS)	Policy statements published by the Department for Energy Security and Net Zero and designated under the Planning Act 2008, setting out national policy for Nationally Significant Infrastructure Projects.
Nationally Significant Infrastructure Project (NSIP)	Large scale development which requires development consent under the Planning Act 2008.
Neap tide	Tide that occurs when the sun and moon are at right angles to each other and the gravitational pull of the sun partially cancels out the pull of the moon on the ocean.

Term	Meaning
Non-designated heritage asset	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes assets identified by the local planning authority (including local listing).
Offshore export cable corridor	The proposed corridor in which the offshore export cables will be located, from either the Morven North or Morven South offshore substation platform to the transition joint bay (TJB) at landfall.
Offshore export cables	HVDC cables which bring electricity from either the Morven North or Morven South offshore substation platform to the TJB at landfall.
Offshore substation platform (OSP(s))	OSP(s) comprise the support structure, topside and electrical components used for collecting the electricity generated by the wind turbine generators, in Scottish waters, for the passage or transmission to landfall. These OSP(s) can be divided into two types: - HVAC collector substations; - HVDC converter substations.
Offshore Waters	The area seaward of 12nm extending out to the UK's continental shelf.
Onshore export cable corridor	The proposed corridor within which onshore export cables and associated infrastructure will be laid and located, from the TJB to the onshore land substation.
Onshore export cables	HVDC cables which bring electricity from the TJB to the onshore land substation.
Operations and maintenance phase (O&M)	The operational and maintenance phase of the MHPGC Project.
Ordnance	Refers to military supplies, especially weapons and bombs.
Outline Offshore Archaeology Written Scheme of Investigation	Outline document to set out archaeological investigation procedures for offshore areas, including pre-construction surveys, mitigation measures and implementation of a Protocol for Archaeological Discoveries.
Palaeoenvironmental	An environment of a past geological age.
Palaeochannel	A remnant of an inactive river or stream channel that has been filled or buried by younger sediment.
Palaeocoastline	A former coastline of a past geologic age.
Palaeoenvironment	The environment of the geologic past.
Palaeolandscape	Past terrestrial and coastal landscapes that formed during periods of lower sea level
Physical processes	The collective term for the following: hydrodynamics (water levels and currents); winds and waves; stratification and frontal systems; geology and seabed sediments (including sediment transport); seabed geomorphology; and coastal geomorphology.
Planning Inspectorate (PINS)	The PINS is an executive agency of the UK Government responsible for administering and examining DCO applications for NSIPs in England. PINS manages the application process, oversees consultation and examination, and makes a recommendation to the relevant Secretary of State on whether consent should be granted.

Term	Meaning
Primary mitigation	Measures included as part of the location or design of the MHPGC Project made during the pre-application phase that are an inherent part of the MHPGC Project and do not require additional action to be taken. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the MHPGC Project, the parameters and associated commitments secured by the DCO and marine licence, or both.
Receptor	A specific environmental feature, resource, population or asset that may be affected by the MHPGC Project, either directly or indirectly, and which falls within the environmental topics considered under the EIA Regulations.
Relative Sea Level (RSL)	The local change in sea level height compared to the adjacent land.
Residual effects	Effects that continue to exist after mitigation has been applied.
Scheduled Monument	A monument which has been scheduled by the Historic Environment Scotland (acting on behalf of the Scottish Ministers) in Scotland, or the Secretary of State in England, as being of national importance under the 'Ancient Monuments and Archaeological Areas Act 1979'.
Sea Level Index Points (SLIPs)	Geological point showing historic sea levels.
Secondary mitigation	Actions that will require further activity to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures, both pre-mitigation and residual effects are presented.
Sidescan Sonar	An instrument that used sound to create a two-dimensional representation of the seabed.
Significance	Effect factor that is determined by the magnitude of impact along with the sensitivity of the receptor.
Site specific survey data	The 2022 Morven Offshore Wind Array Project data, the 2023 data purchased by the MHPGC Project, and the 2024 MHPGC Project-specific survey data are collectively referred to within this technical report as the site-specific survey data.
Spring Tide	Tide that occurs when the sun and moon are directly in line with the Earth and their gravitational pulls on the ocean reinforce each other.
Spring Tidal Excursion	The distance suspended sediment is transported prior to being carried back on the returning tide.
Statutory consultee	Organisations that are required to be consulted by an applicant pursuant to section 42 of the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees.
Sub-bottom Profiler	An instrument that uses sound to create a representation of the sub-seabed stratigraphy.
Survey Area	The area within which field surveys for the environmental topic are undertaken. This would include all areas for which impacts from the MHPGC Project may occur on relevant receptors.

Term	Meaning
Temporary Exclusion Zone (TEZ)	Recommended to temporarily protect, <i>in situ</i> , potentially archaeologically significant material, they are to be agreed between the developer, the archaeological curator, and the regulator. Where an TEZ has been implemented no project activities, directly, or indirectly, impacting the seabed, are to take place within the extents.
Tidal cycle	One high tide plus a successive low tide.
Tidal ellipse	The illustration of the variance of tidal currents in horizontal space.
The Study Area	For each environmental topic, the baseline environment will be characterised, and the likely significant effect will be described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent across which likely significant effects of the MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence (Zoi)).
Transboundary effects	Assessment of likely significant effects resulting from the MHPGC Project on the interests of another European Economic Area (EEA) state(s).
Transboundary impact	Potential impacts resulting from the MHPGC Project and affecting another European Economic Area (EEA) state.
Transition Joint Bay (TJB)	An underground bay housing a joint which connects the offshore export cables to the onshore export cables. The TJB will be located in the vicinity of the onshore side of the landfall.
Trenchless techniques	Construction methods used to install underground or sub-surface infrastructure without the need for continuous open trench excavation, thereby avoiding or minimising disturbance to surface features, habitats and existing land users.
Unexploded Ordnance (UXO)	Unexploded ordnance are explosive weapons (bombs, shells, grenades, land mines, naval mines, etc.) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.
United Kingdom Hydrographic Office (UKHO)	The UKHO is a government agency responsible for providing hydrographic and marine geospatial data, charts and publications to support safe navigation and marine operations.
Zone of influence (Zoi)	The area within which impacts arising from the MHPGC Project could occur upon receptors.

Acronyms

Acronym	Meaning
AEZ	Archaeological Exclusion Zone
AF	Acoustic Facies
ARS	Archaeological Research Services
BGS	British Geological Survey
BP	Before Present
c.	Circa

Acronym	Meaning
CEA	Cumulative Effects Assessment
CIfA	Chartered Institute for Archaeologists
CITiZAN	Coastal and Intertidal Zone Archaeology Network
COWRIE	Collaborative Offshore Wind Research into the Environment
CPT	Cone Penetration Test
DEFRA	Department for Environment, Food & Rural Affairs
DBA	Desk-based Assessment
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EMODnet	European Marine Observation and Data Network
ES	Environmental Statement
EWG	Expert Working Group
HE	Historic England
HER	Historic Environment Record
HES	Historic Environment Scotland
HMPA	Historic Marine Protected Area
HSC	Historic Seascape Characterisation
ICOMOS	International Council on Monuments and Sites
ID	Identification
ISEP	Institute of Sustainability and Environmental Professionals
IEMA	Institute of Environmental Management and Assessment
KP	Kilometre Point
LSE	Likely Significant Effects
MBES	Multibeam Echo Sounder
MD-LOT	Marine Directorate - Licensing Operations Team
MDS	Maximum Design Scenario
MEDIN	Marine Environment Data and Information Network
MFE	Mass Flow Excavation
MHPGC	Morven Hawthorn Pit Grid Connection
MHWS	Mean High Water Springs
MIS	Marine Isotope Stages
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MoD	Ministry of Defence
MPA	Marine Protected Area
MSGSL	Mega-Scale Glacial Lineations

Acronym	Meaning
MvOWL	Morven Offshore Wind Limited
NERCZA	North East Rapid Coastal Zone Assessment
NGI	Norwegian Geotechnical Institute
NMHR	National Marine Heritage Record
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRHE	National Record of the Historic Environment
O&M	Operation and Maintenance
ORRs	Offshore Regional Reports
OSP	Offshore Substation Platform
PAD	Protocols for Archaeological Discoveries
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PLGR	Pre-Lay Grapnel Run
RAF	Royal Air Force
RFA	Royal Fleet Auxiliary
ROV	Remotely Operated Vehicle
RSL	Relative Sea Level
SBP	Sub-bottom Profiler
SLIPS	Sea Level Index Points
SoS	Secretary of State
SPP	Scottish Planning Policy
SSC	Suspended Sediment Concentration
TAEZ	Temporary Archaeological Exclusion Zones
UHRs	Ultra High-Resolution Seismic
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UNESCO	United Nations Educational, Scientific and Cultural Organization
UXO	Unexploded Ordnance
VCs	Vibrocores
WSI	Written Scheme of Investigation
ZoI	Zone of Influence

Units

Unit	Meaning
cm	Centimetre
GW	Gigawatt
Hz	Hertz
J	Joules
kg	Kilogram
kHz	Kilohertz
km	Kilometres
m	Meters
m/s	Meters per second
MPa	Megapascal
nm	Nautical Miles
ppm	pixels per meter
qt	Corrected cone tip resistance
nT	Nanotesla
<	Less than
>	Greater than

9 Marine and Intertidal Archaeology

9.1 Introduction

- 9.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary findings of the Environmental Impact Assessment (EIA) work undertaken to date for the Morven Hawthorn Pit Grid Connection Project (hereafter 'MHPGC Project'), as described in **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 9.1.1.2 The chapter considers the potential impacts and effects on marine and intertidal archaeology that could result from the construction, operation and maintenance (O&M) and decommissioning phases of the MHPGC Project. Specifically, it relates to the offshore elements of the MHPGC Project from the offshore substation platform(s) (OSPs) within Morven North Offshore Wind Array Project or Morven South Offshore Wind Array Project (hereafter 'Morven North and Morven South') located within Scottish offshore waters, transiting through English offshore and inshore waters, to Mean High Water Springs (MHWS) at landfall.
- 9.1.1.3 This chapter describes the methodology, datasets that have informed the preliminary assessment, baseline conditions, including future baseline, mitigation measures and the preliminary residual significant effects on marine and intertidal archaeology that could result from the MHPGC Project.
- 9.1.1.4 The assessment is informed by the following chapters:
- **Volume 1, Chapter 2: Project Description, of the PEIR;**
 - **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR;**
 - **Volume 2, Chapter 1: Physical Processes, of the PEIR;**
 - **Volume 1, Chapter 5: Policy and Legislation, of the PEIR;**
 - **Volume 4, Chapter 5: Inter-related Effects, of the PEIR.**
- 9.1.1.5 The chapter also draws on information contained within the following annexes:
- **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR;**
 - **Volume 1, Annex 4.3: Transboundary Screening, of the PEIR;**
 - **Volume 1, Annex 4.4: Cumulative Screening and Location Plan, of the PEIR;**
 - **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR;**
 - **Volume 3, Annex 4.1: Onshore Archaeological Desk-Based Assessment Report, of the PEIR.**
- 9.1.1.6 This PEIR will offer a comprehensive overview of the MHPGC Project's potential environmental impacts and mitigation measures, presenting essential data to stakeholders for review and feedback. The PEIR will also be informed by the ongoing pre-application consultation process.
- 9.1.1.7 Following statutory consultation, comments will be reviewed and considered, where appropriate, in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent and a marine licence application(s) to Marine Directorate Licensing Operations Team (MD-LOT).

9.2 Legislative and policy context

9.2.1 Overview

- 9.2.1.1 The full relevant legislation and policy context for the MHPGC Project has been detailed in **Volume 1, Chapter 5: Policy and Legislation, of the PEIR**. This section sets out the legislation and planning policy that is relevant to the preliminary marine and intertidal archaeology assessment.

9.2.2 Legislation

The World Heritage Convention (1972)

- 9.2.2.1 The Convention defines the concepts of nature conservation and the preservation of cultural properties, recognising the way in which people interact with nature and the need for balance

between nature and culture. Signatories are required to preserve World Heritage Sites defined by the Convention and to identify and preserve national heritage through suitable planning programmes and measures.

- 9.2.2.2 As a signatory to the Convention, the United Kingdom (UK) has agreed to abide by the stipulations of the Convention.

Protection of Wrecks Act (1973)

- 9.2.2.3 Enacted to safeguard wreck sites in UK territorial waters that are of historical, archaeological, or artistic importance, or pose a danger to navigation or public safety. The Act provides a legal mechanism for managing and preserving wreck sites *in situ*.
- 9.2.2.4 In Scottish waters, Section 1 of the Act has been superseded by the Marine (Scotland) Act 2010. However, Section 2, which outlines the powers of the Receiver of Wreck when a potentially dangerous wreck is considered, remains valid in Scottish waters.

Ancient Monuments and Archaeological Areas Act (1979)

- 9.2.2.5 Enshrines the protection and preservation of remains with high archaeological or historical interest. Operations or activities with the potential to disturb or damage the remains within the boundaries of the protected area may be permitted following the granting of Scheduled Monument Consent from the Secretary of State but any unlicensed operations that may disturb the site are illegal.

United Nations Conventions on the Law of the Sea (1982)

- 9.2.2.6 Establishes rules governing the use of the oceans and outlines both the traditional legal framework and introduces new additions. Provisions relating to the marine historic environment state how remains should be treated and that ownership of remains lay with the state of origin.

Protection of Military Remains Act (1986)

- 9.2.2.7 Provides protection for the wreckage of military aircraft and certain military wrecks. Designations can be either as a Controlled Site or Protected Place where access may be permitted but any operations that may disturb the site are illegal, unless licenced by the Ministry of Defence (MoD). All military aircraft are automatically protected under this legislation; however, vessels must be designated individually.

European Convention on the Protection of Archaeological Heritage (Revised) (1992) (the Valletta Convention)

- 9.2.2.8 The Convention sets out conservation and enhancement of archaeological heritage, both terrestrial and marine, as a goal of planning policy and sets guidelines for the funding of physical investigation and research, publication of research findings, public access and awareness and constitutes an institutional framework for pan-European cooperation on archaeological heritage.

Merchant Shipping Act (1995)

- 9.2.2.9 The Act stipulates that the 'Receiver of Wreck' administers and is responsible for processing incoming reports of wreck and cargo.

International Council of Monuments and Sites Charter on the Protection and Management of Underwater Cultural Heritage (1996) (the Sofia Charter)

- 9.2.2.10 The Sofia Charter is intended to encourage the protection and management of underwater cultural heritage in inland and inshore waters, shallow seas and deep oceans. The Sofia Charter should be read as a supplement to the International Council on Monuments and Sites Charter for the Protection and Management of Archaeological Heritage (1990), which defines "...archaeological heritage..." as that part of the material heritage in respect of which archaeological methods provide primary information, comprising all vestiges of human existence and consisting of places relating to all manifestations of human activity, abandoned structures and remains of all kinds, together with all the portable cultural material associated with them.

European Landscape Convention (2000)

- 9.2.2.11 The Convention introduced a Europe-wide concept centring on the quality of landscape protection, management and planning and covering the entire territory, not just outstanding landscapes. Through its approach and broader scope, it complements the Council of Europe's and United Nations Educational, Scientific and Cultural Organisation's (UNESCO) heritage conventions. The definition of "seascape" from the Convention is that used by the UK Marine Policy Statement (2011).

United Nations Educational, Scientific and Cultural Organisation Convention on the Protection of Underwater Heritage (2001)

- 9.2.2.12 The Convention provides a framework on how to better identify, research and protect underwater heritage while ensuring its preservation and sustainability. The Convention has informed the embedded mitigation strategies of the MHPGC Project.

Marine and Coastal Access Act (2009)

- 9.2.2.13 The Marine and Coastal Access Act (2009) forms key legislature underpinning the activities of the Marine Management Organisation and the Marine Directorate, who are responsible for overseeing balanced and considerate marine development in English and Scottish waters respectively. As one of the stakeholders, MD-LOT has been consulted throughout Scoping Opinions, and its key requirements are adhered to by the MHPGC Project. The Act also sets out powers to designate Marine Protection Areas (MPAs), including Historic MPAs (HMPAs).

Marine (Scotland) Act (2010)

- 9.2.2.14 The Act provides definition and means to apply the designation of HMPAs in respect of historically significant areas within the marine zone, including wrecks formerly protected under the Protection of Wrecks Act (1973). The Marine (Scotland) Act (2010) supersedes the Protection of Wrecks Act (1973) in Scottish waters.

Historic Environment (Scotland) Act (2014)

- 9.2.2.15 Sets out the role and legal status of Historic Environment Scotland (HES). A right of appeal against certain decisions by HES has also been introduced.

9.2.3 National policy context***National Policy Statements***

- 9.2.3.1 National Policy Statements (NPS) set out the primary policy framework for a Development Consent Order (DCO) under which the MHPGC Project will be considered. This framework includes guidelines, requirements and criteria that the MHPGC Project must meet to obtain consent and proceed with development.
- 9.2.3.2 Table 9.1 provides details of the NPS relevant to marine and intertidal archaeology and how and where they are covered in the PEIR:
- NPS for energy, 2025 (EN-1) (DECC, 2026a);
 - NPS for renewable energy infrastructure, 2025 (EN-3) (DECC, 2026b);
 - NPS for electricity networks infrastructure, 2025 (EN-5) (DECC, 2026c).

Table 9.1: Summary of the NPS provisions relevant to marine and intertidal archaeology

Summary of relevant NPS provisions	How and where considered in the PEIR
NPS EN-1	
Paragraph 5.9.12 “As part of the ES the applicant should provide a description of the significance of the heritage assets affected by the proposed development including any contribution made by their setting. 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 their significance. As a minimum, the applicant should have consulted the relevant Historic Environment Record (or, where the development is in English or Welsh waters, Historic England or Cadw) and assessed the heritage assets themselves using expertise where necessary according to the proposed development’s impact”.	The significance of marine and intertidal archaeology receptors is summarised in Section 9.4 and the assessed significance of effects is presented in Section 9.8. Data sources, including the relevant HER and Historic England records, which informed the baseline assessment are presented in Section 9.4.4. Further detail is presented within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. No setting assessment has been scoped in for marine and intertidal archaeology receptors as there is no surface piercing infrastructure proposed within the marine and intertidal section of the MHPGC Project PEIR Red Line Boundary with the potential to affect the setting of heritage assets..
Paragraph 5.9.13 “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 applicant 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.”	A desk-based assessment (DBA) has been undertaken to assess the archaeological interest of the offshore and intertidal heritage resource (Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR) summarised in Section 9.4. No setting assessment has been scoped in for marine and intertidal archaeology receptors as there is no surface piercing offshore infrastructure proposed within the marine and intertidal extents of the MHPGC Project PEIR Red Line Boundary with the potential to affect the setting of heritage assets.
Paragraph 5.9.14 “The applicant 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.”	The detailed impact assessment for marine and intertidal archaeology receptors is presented within Section 9.8, including conclusions regarding the extent of any potential impacts. The impact assessment for onshore archaeology receptors is detailed within Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage.

Summary of relevant NPS provisions	How and where considered in the PEIR
Paragraph 5.9.19 “Where the loss of the whole or part of a heritage asset’s significance is justified, the Secretary of State will require the applicant to record and advance understanding of the significance of the heritage asset before it is lost (wholly or in part). The extent of the requirement should be proportionate to the asset’s importance and significance and the impact. The applicant should be required to publish this evidence and to deposit copies of the reports with the relevant Historic Environmental Record. They should also be required to deposit the archive generated in a local museum or other public repository willing to receive it.”	Preservation <i>in situ</i> and avoidance is the preferred approach and appropriate commitments to mitigation measures are presented in Section 9.7, Table 9.20. An Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) (CoT63 and CoT64) will accompany the DCO submission and marine licence application to the Scottish Ministers, providing further details of approaches to safeguard the resource and information regarding archive deposition for the MHPGC Project related data and associated reports.
Paragraph 5.9.20 “Where appropriate, the Secretary of State will impose requirements on the Development Consent Order to ensure that the work is undertaken in a timely manner, in accordance with a written scheme of investigation that complies with the policy in this NPS and which has been agreed in writing with the relevant local authority, and to ensure that the completion of the exercise is properly secured.”	The MHPGC Project Outline Offshore WSI and PAD (CoT63 and CoT64) will recommend timescales required for work to be undertaken, associated reporting to be submitted and archives to be deposited. The Outline Offshore WSI and PAD (CoT63 and CoT64) will be prepared in consultation with and approved by relevant stakeholders prior to its implementation. Commitments to mitigation measures (presented in Section 9.7, Table 9.20) will be secured through the Outline Offshore WSI and PAD (CoT63 and CoT64).
Paragraph 5.9.28 “When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset’s conservation. The more important the asset, the greater the weight should be. This is irrespective of whether any potential harm amounts to substantial harm, total loss, or less than substantial harm to its significance.”	The significance of any designated heritage assets and any potential impact have been discussed in the baseline conditions in Section 9.4 and embedded mitigation measures, which favour avoidance, outlined within Section 9.7, Table 9.20. This provides the Secretary of State with sufficient information as to make an informed decision as to an asset’s prospective conservation.
Paragraph 5.9.29 “The Secretary of State should give considerable importance and weight to the desirability of preserving all heritage assets. Any harm or loss of significance of a designated heritage asset (from its alteration or destruction, or from development within its setting) should require clear and convincing justification.”	The significance of all heritage assets has been presented in Section 9.4 and potential impacts within Section 9.8. Commitments to mitigation measures, which favour avoidance, are outlined within Section 9.7, Table 9.20. This provides the Secretary of State with sufficient information as to make an informed decision on the significance of any alteration or loss of any assets.
NPS EN-3	
Paragraph 2.8.145 “Applicants should consult with the relevant statutory consultees, such as Historic England or Cadw, on the potential impacts on the marine historic environment at an early stage of development during pre-application, taking into account any applicable guidance (e.g., offshore renewables protocol for archaeological discoveries).”	Stakeholder engagement with statutory consultees relevant to marine and intertidal archaeology has been ongoing since November 2024. The results of stakeholder engagement regarding marine and intertidal archaeology are detailed within Section 9.3. The results of stakeholder engagement regarding onshore archaeology are detailed within Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage.

Summary of relevant NPS provisions	How and where considered in the PEIR
Paragraph 2.8.147 “Desk based studies to characterise the features of the historic environment that may be affected by a proposed development and assess any likely significant effects should be undertaken by competent archaeological experts. These studies should consider any geotechnical or geophysical surveys that have been undertaken to aid the wind farm and/or offshore transmission design.”	Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR, constitutes the detailed DBA for the MHPGC Project and identified any related receptors. The DBA incorporated relevant cultural heritage datasets and the results of MHPGC Project-acquired geophysical and geotechnical surveys, undertaken within the MHPGC Project PEIR Red Line Boundary, to establish the marine and intertidal archaeology baseline characterisation, summarised within Section 9.4. The likely significance of effects is presented within Section 9.8.
Paragraph 2.8.149 “Applicants are required to determine how any known heritage assets might best be avoided. The applicant will be expected to conduct all necessary examination and assessment exercises using a variety of survey techniques to plan the development so as to optimise opportunities for avoidance.”	Avoidance of known archaeological receptors, allowing preservation <i>in situ</i>, is the preferred type of mitigation. Known archaeological receptors have been established via relevant heritage datasets and archaeological interpretation of geophysical and hydrographic data for the MHPGC Project PEIR Red Line Boundary. These are outlined within Section 9.4. Embedded mitigation methods are outline within Section 9.7, Table 9.20. Further specific detail will be included within the Outline Offshore WSI and PAD (CoT63 and CoT64), to accompany the DCO submission and marine licence application to the Scottish Ministers.
Paragraph 2.8.150 “Once a site has been chosen, it may be necessary to undertake further archaeological assessment, including field evaluation investigations prior to construction, to understand a known site’s significance and full extent, and, to identify as yet unknown heritage assets when considering the options for detailed site development, in accordance with an archaeological written scheme of investigation included with the application.”	The extent and nature of known marine and intertidal archaeology receptors and the potential for unknown archaeology have been established in Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR and summarised within Section 9.4. Procedures for encountering unforeseen archaeological extents and hitherto unknown sites and remains will be set out within the Outline Offshore WSI and PAD (CoT63 and CoT64), to accompany the DCO submission and marine license application to the Scottish Ministers. Activity-specific Method Statements will be prepared to inform MHPGC Project-related activities that have the potential to interact with marine and intertidal archaeology receptors, as set out within the Outline Offshore WSI and PAD (CoT63 and CoT64). Commitment to the mitigation measures (as presented in Section 9.8) will continue throughout the MHPGC Project’s lifespan. No requirement for secondary mitigation measures has been identified (see Section 9.13.2).
Paragraph 2.8.151 “Assessment may also include the identification of any beneficial effects on the marine historic environment, for example through improved access or the contribution to new knowledge that arises from investigation.”	A consideration of any potential benefits arising from works associated with the MHPGC Project are included within Section 9.8.
NPS EN-5	

Summary of relevant NPS provisions	How and where considered in the PEIR
Paragraph 2.9.26 "In such cases the Secretary of State should only grant development consent for underground or subsea sections of a proposed line over an overhead alternative if they are satisfied that the benefits accruing from the former proposal clearly outweigh any extra economic, social, or environmental impacts that it presents, the mitigation hierarchy has been followed, and that any technical obstacles associated with it are surmountable. In this context it should consider: (...) there can also be issues where subsea cables make landfall, as much coastal land is protected habitat with environmental and heritage designations and landfall connections could cause additional disruption to coastal communities and the environment;"	An intertidal walkover survey was conducted at the landfall (coordinated within the onshore topic owners; see Volume 3, Annex 4.1: Onshore Archaeological Desk-Based Assessment Report) to identify and characterise the extent and nature of any known/unknown maritime archaeology receptors that may be impacted by the MHPGC Project. The results of this survey were detailed within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR and summarised within Section 9.4.

National Planning Policy Framework

- 9.2.3.3 The National Planning Policy Framework (NPPF) has the potential to be considered important and relevant to the Secretary of State (SoS) consideration of the MHPGC Project (Department for Levelling Up, Housing and Communities, 2025). **Table 9.2** provides details of the elements of the NPPF that are relevant to marine and intertidal archaeology and how and where they are covered in the PEIR or will be covered within the ES. This is taken from the previous NPPF (2025), which has since been updated. The revised NPPF (2026) shall be reviewed post-PEIR submission and relevant changes will be incorporated at ES stage.

Table 9.2: Summary of NPPF (2025) requirements relevant to marine and intertidal archaeology

NPPF Section 16	How and where this is considered in the PEIR
Paragraph 207 "In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation."	Section 9.4 summarises the baseline established by Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR, which forms the detailed DBA. This describes the relevant cultural heritage datasets accessed and establishes the potential and significance of the marine heritage resource that could be impacted by the MHPGC Project.

NPPF Section 16	How and where this is considered in the PEIR
Paragraph 212 “When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset’s conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance. Paragraph 213 Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Paragraph 216 The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.”	Section 9.7, Table 9.20 details the MHPGC Project’s commitment to mitigation measures designed to reduce the potential for impacts to marine and intertidal archaeology receptors to ‘not significant’ levels in EIA terms. Section 9.8 details the assessment of the significance of potential effects on identified marine and intertidal archaeology receptors, considering the embedded mitigation measures presented in Section 9.7. The same assessment has been conducted for all marine and intertidal archaeology receptors, whether designated or non-designated.

9.2.4 Marine planning policy context

9.2.4.1 The following marine plans are relevant to marine and intertidal archaeology and have informed the assessment of preliminary effects in this chapter. Their relevance to the MHPGC Project is outlined in Table 9.3:

- The UK Marine Policy Statement (MPS) (Department for Environment, Food and Rural Affairs (DEFRA), 2020);
- Scotland’s National Marine Plan (Marine Directorate, 2015);
- Northeast Inshore and Northeast Offshore Marine Plan (Marine Management Organisation (MMO), 2024).

Table 9.3: Marine planning policy relevant to marine and intertidal archaeology

Marine plan description	How and where considered in the PEIR
UK Marine Policy Statement (2011)	
Paragraph 2.6.6.7 “In considering the significance of heritage assets and their setting, the marine plan authority should take into account the particular nature of the interest in the assets and the value they hold for this and future generations. This understanding should be applied to avoid or minimise conflict between conservation of that significance and any proposals for development.”	Consideration of the significance, sensitivity and value of marine and intertidal archaeology receptors has formed a key stage of the impact assessment methodology, outlined in Section 9.1.1.1 and implemented in Section 9.8.
Paragraph 2.6.6.8 “The marine plan authority, working with the relevant regulator and advisors, should take account of the desirability of sustaining and enhancing the significance of heritage assets and should adopt a general presumption in favour of the conservation of designated heritage assets within an appropriate setting. The more significant the asset, the greater should be the presumption in favour of its conservation. Substantial loss or harm to designated assets should be exceptional, and should not be permitted unless it can be demonstrated that the harm or loss is necessary in order to deliver social, economic or environmental benefits that outweigh the harm or loss.”	Embedded mitigation measures favour the preservation <i>in situ</i> of marine and intertidal archaeology receptors. These measures are outline in Section 9.7. Receptors carrying the highest significance will be provided with Archaeological Exclusion Zones (AEZs) (CoT64) where required. Further detail concerning mitigation to be applied to receptors will be detailed within the Outline Offshore WSI and PAD (CoT63 and CoT64).
Scottish National Marine Plan (2015)	
“Policy GEN 6 Historic environment: Development and use of the marine environment should protect and, where appropriate, enhance heritage assets in a manner proportionate to their significance.”	Section 9.4 summarises the marine and intertidal archaeology baseline detailed within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. Section 9.7 details the embedded mitigation methods which favour avoidance and preservation <i>in situ</i> of marine and intertidal archaeology receptors. As part of the assessment of magnitude of impacts, potential beneficial impacts have also been considered as set out within Table 9.16. Beneficial impacts, such as the discovery of previously unknown remains that might contribute to relevant heritage research agendas, may, in part, offset potentially adverse impacts.

Marine plan description	How and where considered in the PEIR
Historic Environment Policy for Scotland (2019)	
There are six policies within the document which define how the historic environment should be managed: • “Decisions affecting any part of the historic environment should be informed by an inclusive understanding of its breadth and cultural significance. • Decisions affecting the historic environment should ensure that its understanding and enjoyment as well as its benefits are secured for present and future generations. • Plans, programmes, policies and strategies, and the allocation of resources, should be approached in a way that protects and promotes the historic environment. If detrimental impact on the historic environment is unavoidable, it should be minimised. Steps should be taken to demonstrate that alternatives have been explored, and mitigation measures should be put in place. • Changes to specific assets and their context should be managed in a way that protects the historic environment. Opportunities for enhancement should be identified where appropriate. If detrimental impact on the historic environment is unavoidable, it should be minimised. Steps should be taken to demonstrate that alternatives have been explored, and mitigation measures should be put in place. • Decisions affecting the historic environment should contribute to the sustainable development of communities and places. • Decisions affecting the historic environment should be informed by an inclusive understanding of the potential consequences for people and communities. Decision-making processes should be collaborative, open, transparent and easy to understand.”	The baseline marine and intertidal archaeology environment that would potentially be impacted by the MHPGC Project is established within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR and summarised in Section 9.4. The significance of marine and intertidal archaeology receptors, both known and unknown, is established based in part on an assessment of their cultural heritage value, is assessed in Section 9.8, along with an assessment of the significance of potential impact on those receptors. Embedded mitigation, which favours avoidance(outlined within Section 9.7), is designed to remove or reduce direct and indirect adverse impacts on marine and intertidal archaeology receptors so that the resulting significance of impacts are not significant in EIA terms.
National Planning Framework 4 (Scotland) (2023)	
Policy 7 “a) Development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place. The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change. Proposals should also be informed by national policy and guidance on managing change in the historic environment, and information held within Historic Environment Records.	The baseline marine and intertidal archaeology environment that would potentially be impacted by the MHPGC Project was established within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. The significance of marine and intertidal archaeology receptors, both known and unknown, is established based in part on an assessment of their cultural heritage value, (outlined in Section 9.8), along with an assessment of the significance of effect on those receptors. A cumulative impact assessment has also been conducted and can be found within Section 9.9. Embedded mitigation, which favours avoidance (outlined within Section 9.7), is designed to remove or reduce direct and indirect adverse impacts on marine and intertidal archaeology receptors so that the resulting significance of impacts are not significant in EIA terms. National policy is outlined within this Section (9.2) and technical guidance within Section 9.4.3.

Marine plan description	How and where considered in the PEIR
North East Inshore and North East Offshore Marine Plan (2021)	
Policy NE-HER1 This policy aims to conserve and enhance marine and coastal heritage assets by considering the potential for harm to their significance. This consideration will not be limited to designated assets and extends to those non-designated assets that are, or have the potential to become, significant. The policy will ensure that assets are considered in the decision-making process and will make provisions for those assets that are discovered during developments.	Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR identified known and potential marine and intertidal archaeology receptors and presented an assessment of the significance of those receptors. A detailed impact assessment has been undertaken, which has included assessments of significance and value of both designated and non-designated marine and intertidal archaeology receptors (the methodology is outlined within Section 9.1.1.1). The MHPGC Project has committed to embedded mitigations measures as outlined within Section 9.7. Provision and methodology for dealing with unknown archaeological remains identified during the lifespan of the project will be detailed within the Outline Offshore WSI and PAD, to be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers.

9.2.5 Local policy context

- 9.2.5.1 The MHPGC Project lies partly within the jurisdiction of Durham County Council. This extends to Mean Low Water Springs (MLWS), which forms the limit of the Local Plan Policies (Durham County Council, 2026). As this includes the intertidal zone, the Durham Local Plan (Durham County Council, 2020) is relevant to marine and intertidal archaeology and has informed the preliminary assessment of impacts in this chapter. Their relevance to the MHPGC Project is outlined in **Table 9.4**.

Table 9.4: Local policy relevant to marine and intertidal archaeology

Policy description	How and where considered in the PEIR
Durham Local Plan	
Policy 44 Historic Environment "Development will be expected to sustain the significance of designated and non-designated heritage assets ... Development which leads to substantial harm to, or total loss of, the significance of a designated heritage asset will only be acceptable where it can be demonstrated that it is necessary to achieve substantial public benefits that outweigh that harm or loss ... In determining applications which would affect a known or suspected non-designated heritage asset with an archaeological interest, particular regard will be given to the following: i. ensuring that archaeological features are generally preserved in situ; and j. in cases where the balanced judgement concludes preservation in situ should not be pursued, it will be a requirement that they are appropriately excavated and recorded with the results fully analysed and made publicly available."	Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR identified known and potential marine and intertidal archaeology receptors and presented an assessment of the significance of those receptors. A detailed impact assessment has been undertaken, which has included assessments of significance and value of both designated and non-designated marine and intertidal archaeology receptors (the methodology is outlined within Section 9.1.1.1). The MHPGC Project has committed to embedded mitigations measures that favour avoidance and preservation <i>in situ</i> as outlined within Section 9.7. Provision and methodology for dealing with unknown archaeological remains identified during the lifespan of the project will be detailed within the Outline WSI and PAD, to be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers.

9.3 Consultation and engagement

9.3.1 Scoping

- 9.3.1.1 A Scoping Report for the MHPGC Project was issued to the PINS and MD-LOT in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, PINS (on behalf of the SoS) and MD-LOT both provided Scoping Opinions in March 2025 (PINS, 2025; MD-LOT, 2025, respectively).
- 9.3.1.2 **Table 9.5** sets out the key comments raised during the scoping process specific to marine and intertidal archaeology, with details of how these comments have been addressed within the PEIR.

Table 9.5: Summary of scoping responses relevant to marine and intertidal archaeology

Comment	How and where considered in the PEIR
Historic Environment Scotland	
We recommend that the applicant refers to the EIA Handbook for best practice advice on assessing cultural heritage assets impacts.	The <i>Environment Impact Assessment Handbook</i> (HES, 2018) was included within the relevant guidance used to inform the assessment (Section 9.4.3). In particular, this advice was used to refine the methodology of assessing the value/significance of marine and intertidal archaeology receptors (Section 9.5.2; Table 9.14).
MMO	
The MMO defers to Historic England on the suitability of the scope of the assessment with regards to Archaeology and Cultural Heritage impacts.	Historic England (HE) were included as part of the MHPGC Project Marine Archaeology Expert Working Group (EWG). Two meetings of the EWG have taken place to date. Comments and recommendations made by HE during the EWH consultation meetings and the relevant inclusion within the PEIR is detailed below, Table 9.6 .
Historic England	
We note from Section 7.10 'Marine Archaeology' the marine study area is the scoping boundary plus a 2km buffer. We are content this is appropriate to characterise the archaeological baseline. In general, we are pleased with the summary of the baseline environment presented for archaeological receptors, including maritime, aviation, and prehistoric receptors. Particularly, we note that there is one Protection of Military Remains Act 1986 wreck within the scoping boundary.	In line with industry standards, the Marine and Intertidal Archaeology Study Area was expanded to include a 200m buffer above MHWS. This was agreed to by HE, as detailed within Table 9.6 below, who acknowledged that this conforms with conventional assessment.
The data sources set out in Table 7.58 are appropriate and recently accessed, and it is acknowledged that there was no HER [historic environment record] data available within the study area. We further recommend that additional desk-based sources are consulted, such as the Coastal and Intertidal Zone Archaeological Network (CITiZAN) coastal map and any available grey literature. It should also be noted that the National Record of the Historic Environment (NRHE) is becoming the National Marine Heritage Record (NMHR) so this reference should be updated within the MHPGC Project PEIR.	All sources, including those previously accessed for Scoping, were revisited for the production of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR (including the Durham HER and the NMHR for data formerly held by the NHRE) as they are subject to regular updates. Additional desk-based sources were also accessed, including the CITiZAN database and both published and unpublished literature, to establish the marine and intertidal archaeology baseline. Sources accessed are listed within Section 2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR and within Section 9.4.4 of this Chapter.

Comment	How and where considered in the PEIR
We also understand from paragraph 7.10.4.1 that geophysical surveys have been undertaken, and the results will be presented within the PEIR. It would be useful for the details of these surveys to be discussed within the next marine Expert Working Group meeting. We also recommend that geoarchaeological assessments are undertaken on geotechnical samples collected from the project area.	Archaeological assessment and interpretation of all site-specific survey data, including geotechnical samples, is detailed within Section 3 and Section 4 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR and the results summarised within Section 9.4 of this Chapter. MSDS presented the initial results of the geophysical surveys within the EWG2 meeting (see below, Table 9.6).
For the PEIR it is advised that an archaeological desk-based assessment is commissioned from an appropriate and experienced marine archaeological contractor working to recognised professional standards, such as those defined by the Chartered Institute for Archaeologists. This is essential to qualify any material or features of historic environment interest revealed by geophysical or geotechnical surveys and create a comprehensive baseline.	Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR constitutes the archaeological DBA for marine and intertidal archaeology. This combines heritage data, primary and secondary archaeological and historical material and assessment of the geophysical and hydrographic data in order to produce a comprehensive marine and intertidal archaeology baseline. This report was produced by MSDS Marine Ltd. who have extensive experience in marine and intertidal archaeology, in both fieldwork and desk-based projects; including several similar North Sea energy infrastructure projects. MSDS Marine is a Chartered Institute for Archaeologists (CIfA) accredited organisation (see Volume 1, Annex 1.1: Statement of Expertise). The marine and intertidal archaeology baseline is summarised within Section 9.4 of this Chapter.
With regards to the collection of geoarchaeological data, it is important there is a method statement for retention, storage and stage 1 and 2 assessments in place, which contains clear objectives in line with relevant research frameworks. The EIA should therefore set out further guidance documents it will follow on the assessments of survey data, such as the HE Deposit Modelling and Archaeology Guidance for Mapping Buried Deposits (2020).	The potential for archaeological, geoarchaeological and palaeoenvironmental remains to contribute to relevant research frameworks is discussed within Section 5.2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. This is in part built upon Stage 1 and 2 geoarchaeological assessment (MSDS Marine, 2025). Should further GI works be undertaken, the results will be subject to archaeological assessment as detailed within the Outline Offshore WSI and PAD (CoT64).
The proposed impact assessment methodology, as presented in Section 7.10.8, should also consider appropriate guidance relevant to determining the value of maritime, aviation and seabed prehistory. This would be beneficial to the assessment of sensitivity.	Appropriate guidance for Marine and Intertidal Archaeology is detailed within Section 9.4.3 of this Chapter, and this guidance was utilised in determining the value of maritime, aviation and seabed prehistoric archaeology receptors.
We note that all direct and indirect impacts have been scoped into the EIA for marine and intertidal archaeology as set out in Table 7.61. However, this table doesn't include consideration of impacts to presently unknown archaeological receptors. This should be addressed within the MHPGC Project PEIR.	The potential for previously unknown marine archaeological remains is established by chronological period within Section 4.5 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. Consideration for direct and indirect impacts on unknown archaeological receptors forms a material part of Section 9.8 within this Chapter.
We note from Section 7.10.7 'Designed In Measures and Mitigation', Table 7.62, and Appendix A, Table A.1 the proposed mitigation measures. These include adherence to a WSI and a PAD, the use of AEZs, and further investigation of receptors to be impacted. We recommend that further consideration for the micro-siting of infrastructure on the seabed to avoid potential impacts is also included within this section and tables.	Micrositing will be employed where necessary in adherence to embedded mitigation measures (e.g. AEZs) as detailed within Section 9.7 (CoT64). Further detail will form part of the Outline Offshore WSO and PAD (CoT63 and CoT64).

Comment	How and where considered in the PEIR
We are pleased to see the range of mitigation measures proposed within the table and are largely supportive of their content. We recommend these are further developed as the desk-based assessment and site specific geophysical and geoarchaeological assessments are completed and that a draft Outline WSI is submitted with the PEIR. Furthermore, we are pleased to see the detail included in MM-47 regarding ongoing monitoring - it would also be beneficial to set out in more detail what archaeological monitoring of sites may consist of within the PEIR.	The commitments adopted as part of the MHPGC Project have been revised and are detailed within Section 9.7 of this Chapter. All information regarding proposed commitments and associated plans will be included within the Outline Offshore WSI and PAD (CoT63 and CoT64).
However, we note that mitigation measure MM-43 includes the provision for safeguarding comparable sites elsewhere. Considering the rarity and uniqueness of most archaeological finds, we do not consider that this measure is achievable and suggest that revision to MM-43 is required.	This issue was addressed within the Expert Working Group (EWG) Meeting 2 (see below, Table 9.6) and a revised commitment agreed with HE. Commitments adopted as part of the MHPGC Project are detailed within Section 9.7 and referred to where relevant within the assessment of impacts within Section 9.8 . Unavoidable impacts to known sites of archaeological significance will be subject to an archaeological Method Statement to be agreed with the archaeological curator, and in line with the Outline Offshore WSI and PAD (CoT63 and CoT64).
We note that paragraph 7.10.8.2 regarding historic seascape character (HSC) assessment appears to be incomplete. We therefore cannot assess the validity of this section. Further detail will be required on this in terms of how it informs characterisation of the proposed scoping boundary.	A full HSC was conducted and is detailed within Section 4.5.3 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR . The approach to the HSC assessment was discussed and agreed with HE during EWG2 (Table 9.6).
Section 7.10.9 'Potential Cumulative Impacts' appears to discuss ground condition and contamination issues and not marine archaeology. We therefore cannot assess the validity of this section. Further detail will be required on this.	A full assessment of cumulative impacts is included within this Chapter, and can be found within Section 9.9 .
Lastly, we request the need for any archaeological reports produced as a part of this development to be recorded via OASIS V (Online Access to the Index of archaeological Investigations).	The methodology for disseminating the reporting of archaeological findings via OASIS V will be detailed within the Outline Offshore WSI and PAD.
PINS	
ID: 3.10.1 (Ref: N/A) No matters have been proposed to be scoped out of the assessment.	No action.

Comment	How and where considered in the PEIR
ID: 3.10.2 (Ref: Paragraph 7.10.3.1) A 2km buffer around the scoping boundary is proposed to encompass the study area, however limited justification regarding this has been included. The ES should confirm why this study area is appropriate in accordance with relevant guidance and agreement with the relevant statutory consultation bodies.	A justification for the marine and intertidal archaeology Study Area is provided within Section 2.2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. The study area utilises a 2km buffer seaward of MHWS and extends only to 200m above MHWS, which adheres to recognised best practice and consultation with relevant heritage stakeholders such as HE on previous projects. The purpose of the 200m buffer above MHWS is to capture any heritage assets that may enable a more complete understanding of past uses of the marine environment (e.g. sites such as coastguard stations, lighthouses, and ropewalks which typically lie above MHWS but contribute to understanding of the marine archaeological character of a seascape). The Marine and Intertidal Study Area was agreed in consultation with HE in the Marine Archaeology EWG (see below, Table 9.6).
ID: 3.10.3 (Ref: Table 7.61) This table identifies the potential impacts for the proposed assessment but there is no consideration of presently unknown archaeological receptors. This matter should be scoped into the assessment. The applicant's attention is drawn to the comments from HE at appendix 2 of this Opinion. The ES should include an assessment of potential impacts on archaeological receptors, where LSE could occur or the ES should otherwise explain, with evidence of agreement from relevant consultation bodies, why significant effects are not likely to occur.	The consideration of potential impacts to presently unknown archaeological receptors has been scoped into the PEIR as indicated in Section 9.6.1 of this Chapter. Furthermore, the baseline characterisation at Section 9.4 discusses the potential for the discovery of previously unknown archaeological receptors, and a more comprehensive presentation of this potential is set out in Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. The assessment of potential impacts on archaeological receptors is presented in Section 9.8 of this Chapter.
MD-LOT	
The Scottish Ministers agree with the study area for marine archaeology outlined in Section 7.10.3 of the Scooping Report.	Noted.
In line with the HES representation, the Scottish Ministers direct the Applicant to the HES EIA Handbook for best practice advice on assessing cultural heritage impacts.	This guidance is included in the assessment methodology as described in Section 9.4.3 of this Chapter.

9.3.2 Further consultation and engagement

As part of the MHPGC Project Evidence Plan Process (EPP), additional consultation has been undertaken via the Offshore Heritage EWG. Additional consultation has been summarised in **Table 9.6**.

Table 9.6: Summary of further consultation and engagement

Date	Consultee and response type	Comment	How and where considered in the PEIR
05 November 2025	HE EWG1 Meeting – response to Scoping Opinion	Impacts to presently unknown archaeological receptors will be scoped into the assessment for all project phases. HE confirmed they welcome this approach.	The potential for previously unknown marine archaeological remains was established by chronological period within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR . Consideration for direct and indirect impacts on unknown archaeological receptors forms the basis of the impact assessment is presented within Section 9.8 .
		Further justification was required for the Marine and Intertidal Archaeology Study Area. The 2km buffer distances will be considered in relation to the assessment of the marine archaeological potential, and consideration of those receptors in close proximity to the MHPGC Project PEIR Red Line Boundary that may be influenced by indirect impacts through factors such as relevant physical processes. HE welcomed this approach and confirmed that the buffer distance is spatially reasonable.	A justification for the Marine and Intertidal Archaeology Study Area is provided within Section 2.2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR . The study area utilises a 2km buffer seaward of MHWS and extends only to 200m above MHWS, which adheres to recognised best practice and consultation with relevant heritage stakeholders such as HE on previous projects. The purpose of the 200m buffer above MHWS is to capture any heritage assets that may enable a more complete understanding of past uses of the marine environment (e.g. sites such as coastguard stations, lighthouses, and ropewalks which typically lie above MHWS but contribute to understanding of the marine archaeological character of a seascape). The addition of the 200m buffer above MHWS was agreed to by HE within the EWG2 meeting, as detailed below.
		Noted that HSC in English waters was omitted from the EIA Scoping Report but will be included within PEIR and subsequent assessments. It was confirmed that sufficient capability and experience was available to undertake HSC assessments and outlined that the approach would follow that of similar projects. It was concluded that the provision of an update on the HSC assessment and reassurance of approach would be better delivered at EWG2.	A full HSC was conducted and is detailed within Section 4.5.3 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR . The revisitation to and outcome of this topic at EWG2 is outlined below in this table.

Date	Consultee and response type	Comment	How and where considered in the PEIR
		HE confirmed that they were content with the datasets listed and did not find any obvious gaps. HE confirmed that the buffer area was spatially reasonable and welcomed the combination of desk-based study with project specific surveys.	Data sources are outlined within Section 9.4.4 . This includes detail of desk-based sources and the project specific survey data.
		The presence of the designated wreck of the RFA <i>Creosol</i> was discussed. HE noted that in general, high resolution data should be used to provide a clear understanding of any wrecks present but also noted that it was crucial that assessments provide an understanding of unknown archaeological receptors.	Details of the site specific survey methodology are outlined within Section 9.4.4. The quality of project-acquired data was deemed suitable for the purposes of archaeological assessment. The baseline environment details wrecks identified and summarises the potential for unknown archaeology to be present based on the detailed DBA of marine and intertidal archaeology within the MHPGC Marine and Intertidal Archaeology Study Area (Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR). Unknown archaeological sites and remains is defined as an archaeological receptor within the assessment of impacts detailed within Section 9.8.2 of this Chapter.
		HE raised a query regarding whether GI data was available to inform the baseline.	Geotechnical data was only available within Scottish waters. The detailed DBA utilised additional sources, such as BGS, to supplement the available survey data from within English waters (see Section 4.2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. These are also outlined within Section 9.4.4 of this Chapter. It is not proposed that further ground investigations be conducted to inform the marine archaeological baseline assessment, as project-acquired data was deemed suitable Details regarding archaeological involvement in any future geotechnical works, should they take place, will be proposed within the Outline Offshore WSI and PAD (CoT63 and CoT64), to be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers.

Date	Consultee and response type	Comment	How and where considered in the PEIR
		Mitigation Measure MM-43 currently includes the provision for safeguarding comparable sites elsewhere. HE did not consider this measure to be achievable and suggested that revision to this measure would be required. The MHPGC Project suggested MM-43 be removed and a mechanism for appropriate action be taken, where direct impacts are unavoidable, to be implemented on a case-by-case basis through the WSI (MM-44) and MM-41.	Commitments are detailed within Section 9.7. The following measure is presented within CoT64: “Options for the mitigation of unavoidable direct impacts on known sites of archaeological significance (to be presented in greater detail within bespoke and activity-specific Method Statements, to be prepared and agreed with the Archaeological Contractor and the Developer, as necessary).” All information regarding proposed commitments and associated plans will be included within the Outline Offshore WSI (CoT63 and CoT64), to be revised post-application to a Full Offshore WSI and PAD. (Agreed with HE in EWG2 Meeting).
16 July 2026	HE and MMO EWG2 Meeting	MSDS Marine outlined the approach to the Cumulative Effects Assessment at PEIR. This is driven by the Zone of Influence (Zol) for direct and indirect impacts, with direct impacts anticipated to be contained within the Red Line Boundary. MSDS confirmed the Zol for indirect impacts will be informed by the Physical Processes assessment, particularly the Suspended Sediment Concentration (SSC), and that a cumulative project long list was used to inform the CEA, in line with other offshore assessments. No comments were made by stakeholders.	The CEA is detailed in Section 9.9 , following the methodology outlined within the EWG2 meeting.

Date	Consultee and response type	Comment	How and where considered in the PEIR
		MSDS Marine presented revised commitments. These were revised to accurately mitigate any impacts to marine and intertidal archaeology receptors. In particular, the originally proposed commitment for mitigation for unavoidable direct impact via the preservation of comparable sites elsewhere [MM-43 – as proposed at EWG1] has been removed, in line with HE consultation at EWG1. HE confirmed their agreement with the changes to this commitment. Furthermore, MSDS noted that all information regarding proposed commitments and associated plans will be included within the Outline Offshore WSI, to be submitted at ES stage and revised post-consent to a detailed Offshore WSI and PAD.	Commitments adopted as part of the MHPGC Project are detailed within Section 9.7 and referred to where relevant within the assessment of impacts within Section 9.8. The following measure is presented within CoT64: “Options for the mitigation of unavoidable direct impacts on known sites of archaeological significance (to be presented in greater detail within bespoke and activity-specific Method Statements, to be prepared and agreed with the Archaeological Contractor and the Developer, as necessary).” All information regarding proposed commitments and associated plans will be included within the pre-application Outline Offshore WSI and PAD, to be revised post-application to a Full Offshore WSI and PAD, as discussed in the EWG2 meeting.
		MSDS presented the initial findings from the UKHO, Durham HER, NMHR and the assessment of hydrographic data, and explained that the numbers of assets would be reviewed and summarised to present a final indication of the asset data in the project Marine and Intertidal Archaeology Study Area.	The detailed baseline characterisation for marine and intertidal archaeology, incorporating the review of the relevant datasets, is presented within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR and summarised within Section 9.4 of this chapter.
		MSDS explained the Marine and Intertidal Archaeology Study Area has been expanded to include the intertidal zone and a proposed 200m buffer above MHWS. HE agreed this conforms with conventional assessment. HE noted the importance of considering proportionality and risk in assessments.	The 200m buffer above MHWS adheres to recognised best practice and consultation with relevant heritage stakeholders such as HE on previous projects. The purpose of the 200m buffer above MHWS is to capture any heritage assets that may enable a more complete understanding of past uses of the marine environment (e.g. sites such as coastguard stations, lighthouses, and ropewalks which typically lie above MHWS but contribute to understanding of the marine archaeological character of a seascape).

Date	Consultee and response type	Comment	How and where considered in the PEIR
		HE noted that it has coordinated actions with their regional office colleagues for intertidal and onshore areas of projects. HE noted that terrestrial colleagues focused on nationally significant and important designated heritage assets, with all other assets falling under the local authority jurisdiction, so consultation and coordination is required with both the local authority and HE terrestrial staff for this project.	The conclusions of archaeological potential contained within Section 4.5 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR incorporated relevant information, including assessment of palaeolandscape. The assessment of the intertidal zone was conducted in coordination with the onshore archaeological assessment. This will be reviewed at ES stage. Details of onshore archaeological resource and assessment conclusions are detailed within Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage, Volume 3, Annex 4.1: Onshore Archaeological Desk-Based Assessment Report and Volume 3, Annex 4.2: Onshore Archaeology and Cultural Heritage Gazetteer. Cooperative interaction between relevant stakeholders and MHPGC Project topic owners will continue post-PEIR. All future engagement and conclusions will be presented within the ES.
		MSDS explained the amendment to the commitment discussed at EWG1 – removal of the element: <i>'Options include... iii) detailed analysis and safeguarding of otherwise comparable sites 'elsewhere to Mitigation of unavoidable direct impacts on known sites of archaeological significance'</i> and rewording of remainder of commitment. HE agreed in principle.	The revised commitments adopted as part of the MHPGC Project are presented within Section 9.7 (CoT63 and CoT64) and referred to where relevant within the assessment of impacts within Section 9.8.
		MSDS explained the MHPGC Project is seeking to agree the approach to the HSC assessment. HE noted that the HSC is purely to set context, it is not a sensitive receptor therefore HE would expect to see an HSC context setting piece for the overall environmental assessment.	An HSC assessment is included in Section 4.5.3 within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR, where it provides context for the detailed discussion of identified heritage assets within the Marine and Intertidal Archaeology Study Area.

Date	Consultee and response type	Comment	How and where considered in the PEIR
		HE noted that the WSI should include full detail about how project geotechnical works can be informed by archaeological advice and should ensure active and immediate archaeology engagement to ensure no materials are destroyed prior to analysis. HE noted that the MHPGC Project had undertaken only Cone Penetration Test (CPT) investigations in English waters (as opposed to CPT and vibrocore samples in Scottish waters) to inform the DCO application. It was queried if additional GI works will be carried out post-DCO submission or post-determination and clarification on this matter was requested.	The potential for archaeological, geoarchaeological and palaeoenvironmental remains to contribute to relevant research frameworks is discussed within Section 5.2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR. This is in part built upon Stage 1 and 2 geoarchaeological assessment (MSDS Marine, 2025). In response to EWG2, the Applicant clarified that further geotechnical surveys of the offshore cable route are not currently scheduled and will likely occur post-determination and pre-construction. It was further reiterated that the current dataset allowed for a robust PEIR marine archaeology [baseline] assessment to be undertaken (as presented by Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR). Details regarding archaeological involvement in future geotechnical works, should they take place, will be proposed within the Outline Offshore WSI and PAD, to be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers (see also CoT64).
		HE suggested the terrestrial representation for the local authority attend for join-up on the offshore, intertidal and onshore archaeology assessment piece. MSDS will look to incorporate any relevant onshore data to inform the baseline assessment at DCO submission, specifically with regards to the palaeolandscape. HE requested that suitable archaeology mitigation strategies should be outlined in the assessment, particularly as there may be buried or submerged palaeolandscape and palaeoenvironmental evidence located underneath the project area.	Cross-topic engagement with onshore archaeology was undertaken to inform the PEIR and will be undertaken to inform the ES stage, to incorporate any changes to the baseline. The baseline characterisation within Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR has incorporated relevant information from the corresponding section within Volume 3, Chapter 4: Onshore Archaeology, including assessment of palaeolandscape potential. The assessment of the intertidal zone was conducted in coordination with the onshore archaeological assessment. Details of onshore archaeological resource and assessment conclusions are detailed within Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage, Volume 3, Annex 4.1: Onshore Archaeological Desk-Based Assessment Report and Volume 3, Annex 4.2: Onshore Archaeology and Cultural Heritage Gazetteer. The commitments to mitigation measures (CoT63 and CoT64) are presented in Section 9.7 of this Chapter.

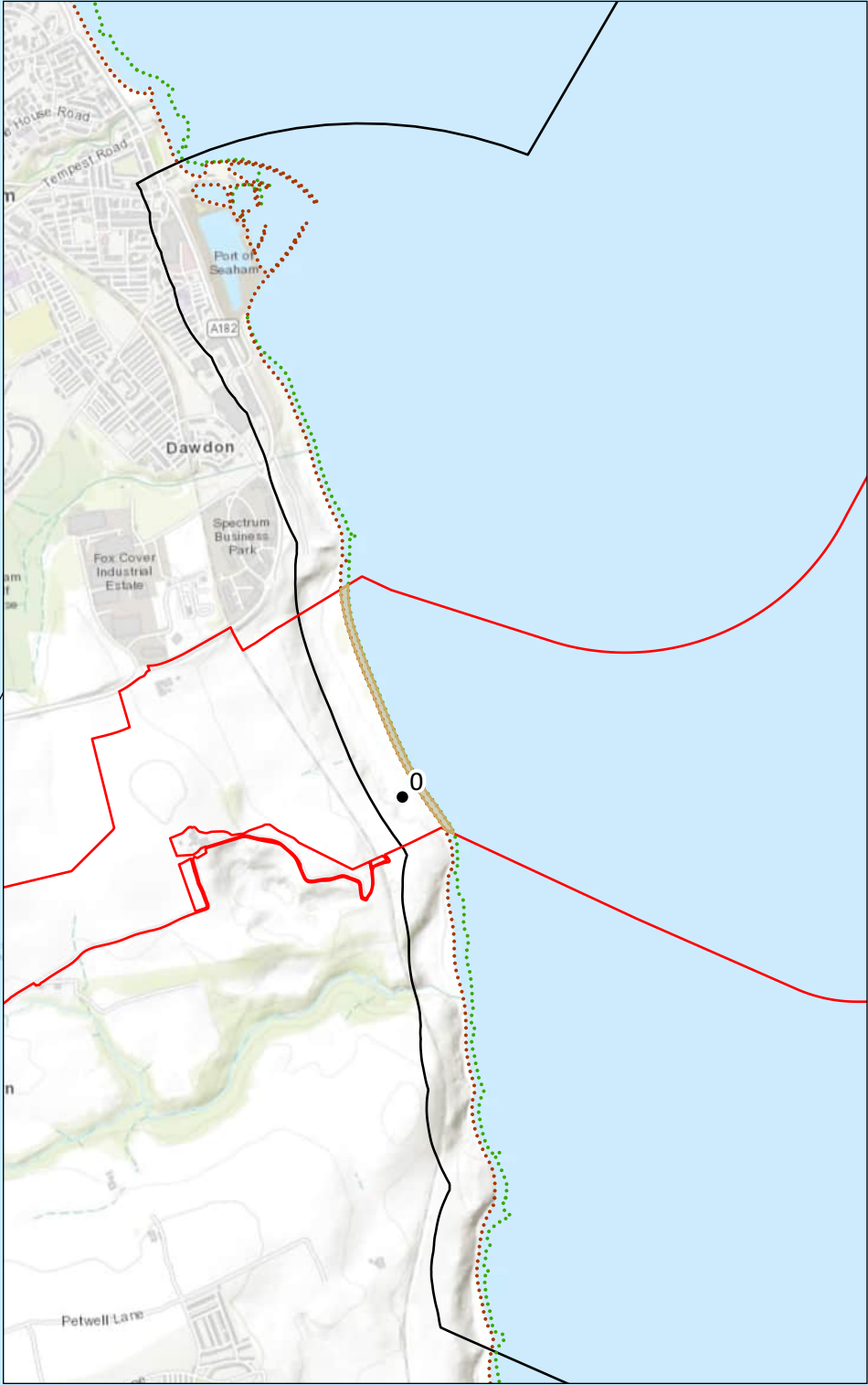
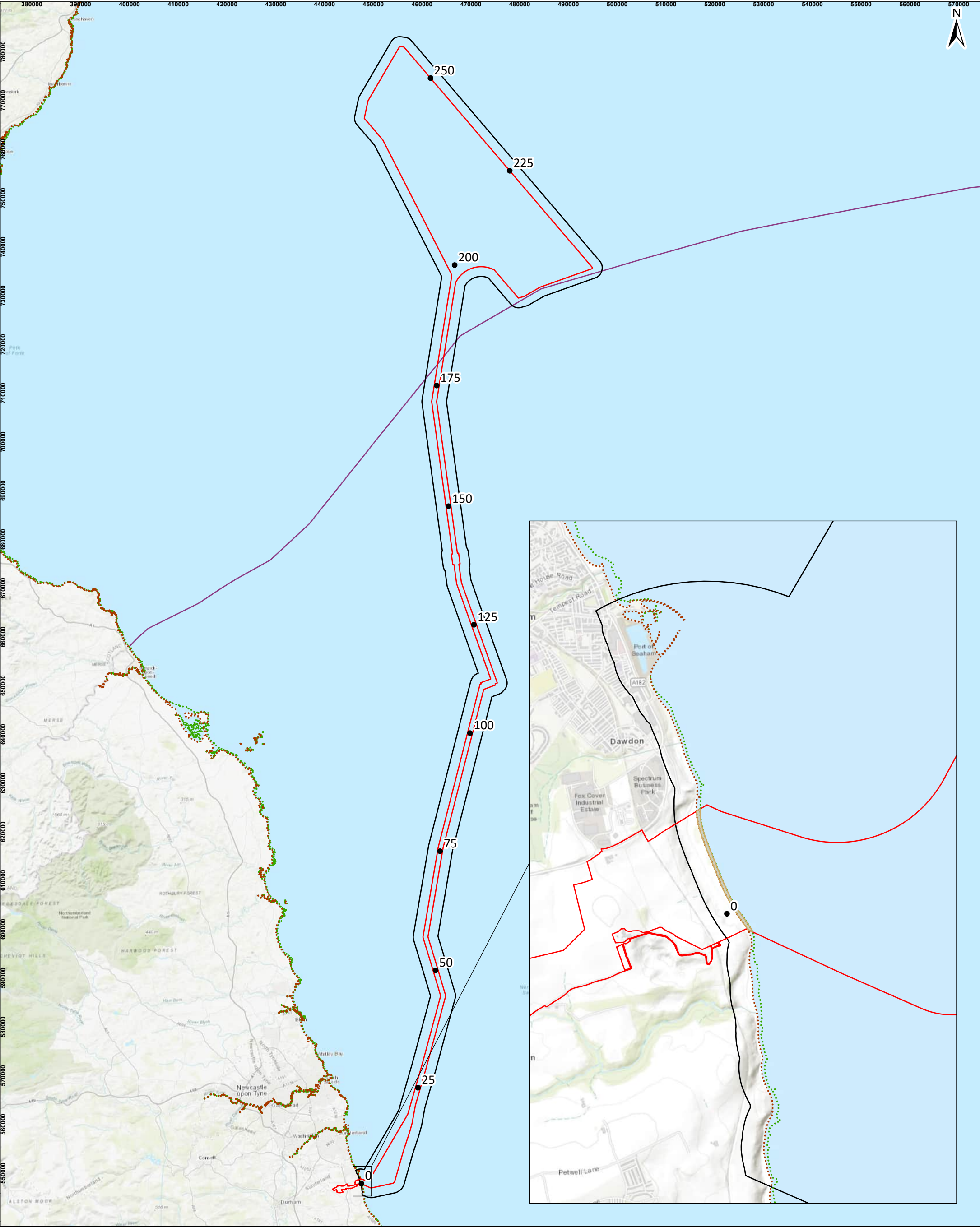
9.4 Baseline Characterisation

9.4.1 Overview

- 9.4.1.1 **Volume 1, Chapter 2: Project Description** sets out the description of the MHPGC Project and **Volume 1, Chapter 4: Approach to Environmental Impact Assessment** sets out the overarching approach that has been used in developing the preliminary environmental information.
- 9.4.1.2 This section describes the methods and data sources used to characterise the baseline for marine and intertidal archaeology within the Marine and Intertidal Archaeology Study Area and describes the existing baseline characteristics. Full details concerning the marine and intertidal archaeology baseline are within **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report**, which constitutes the detailed marine and intertidal archaeology DBA. A summary of that assessment only is presented within this Chapter.

9.4.2 Marine and Intertidal Archaeology Study Area

- 9.4.2.1 The Marine and Intertidal Archaeology Study Area is shown on **Figure 9.1**. This includes the MHPGC Project PEIR Red Line Boundary and a 2km buffer measured from the offshore extent of the MHPGC Project PEIR Red Line Boundary extending to 200m above MHWS, capturing archaeological data from the nearby terrestrial landscape with the potential to aid characterisation and interpretation of the marine archaeological character and potential for remains.
- 9.4.2.2 The Marine and Intertidal Archaeology Study Area is defined to characterise the marine and intertidal archaeology resource within the offshore and intertidal extents of the MHPGC Project PEIR Red Line Boundary and establish a baseline of the potential marine and intertidal archaeology resource, adhering to best practice. The Marine and Intertidal Archaeology Study Area for the MHPGC Project was approved in consultation with HE during the EWG2 meeting, as detailed within **Section 9.3.2, Table 9.6**.
- 9.4.2.3 The Marine and Intertidal Archaeology Study Area is not to be confused with the Zol, which was used to inform the assessment of impacts and is introduced below within **Section 9.6.1, Paragraphs 9.6.1.3 and 9.6.1.4**. This approach was also discussed in consultation with HE during the EWG2 meeting, and no objection was raised (see above, **Section 9.3.2, Table 9.6**).
- 9.4.2.4 The Marine and Intertidal Archaeology Study Area, used to inform the marine and intertidal archaeology baseline assessment (summarised in **Section 9.4.5**), and the Zol (used to inform the assessment of impacts as outlined below within **Section 9.6.1**) are two distinct entities defined and used for these specific assessments and are not interchangeable.
- 9.4.2.5 Where appropriate for wider consideration of the historic environment and in line with stakeholder recommendations, the marine and intertidal archaeology baseline occasionally examined and incorporated data and studies pertaining to the wider region. These additional data and source material contributed to an enhanced understanding of the potential archaeological resource within the Marine and Intertidal Archaeology Study Area but did not necessarily lie within it. All data sources used are detailed within **Section 9.4.4**. Secondary literature sources are referenced within the text and detailed within the references section at **9.14**.





Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
MARINE AND INTERTIDAL ARCHAEOLOGY STUDY AREA

0 10 20 km

Scale@A3:1:700,000

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Drawing Number:
FIGURE 9-1

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Topographic Map: Esri, HERE, Garmin, FAO, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
Topographic: Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA
Topographic: Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA, NOAA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP
-	-	-	-	-
-	-	-	-	-

LEGEND

- MHPGC Project PEIR Red Line Boundary
- Marine Archaeology Study Area
- Scottish-English offshore waters boundary
- Kilometer Points (KP)
- Intertidal Survey Area
- Mean Low Water
- Mean High Water



9.4.3 Relevant guidance

9.4.3.1 The preliminary assessment has been carried out in accordance with the following guidance documents:

- Military Aircraft Crash Sites (English Heritage, 2002);
- Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee, 2006);
- Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology on behalf of the Collaborative Offshore Wind Research Into the Environment (COWRIE), 2007);
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage, 2008);
- Aircraft Crash Sites at Sea (Wessex Archaeology, 2008a);
- Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (Oxford Archaeology on behalf of COWRIE, 2008);
- Assessing Boats and Ships 1860–1950 (Wessex Archaeology, 2008b);
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011);
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (International Council on Monuments and Sites (ICOMOS), 2011);
- Scottish Government Planning Advice Notes, in particular 2/2011: Planning and Archaeology; Planning Advice Note 1/2013: Environmental Impact Assessment (amended 2017; Scottish Government, 2013); Planning Circular 1/2017: Environmental Impact Assessment Regulations (Scottish Government, 2017);
- Protocol for Archaeological Discoveries: Offshore Renewables Projects (Wessex Archaeology on behalf of the Crown Estate, 2014);
- Geoarchaeology: Using earth sciences to understand the archaeological record (HE, 2015a);
- Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland (HES and NatureScot, 2018);
- Designation Policy and Selection Guidance (HES, 2019c);
- Managing Significance in Decision-Taking in the Historic Environment (HE, 2015b);
- Statements of Heritage Significance: Analysing Significance in Heritage Assets HE Advice Note 12 (HE, 2019);
- Standard and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists, 2020);
- Deposit Modelling and Archaeology: Guidance for Mapping Buried Deposits (HE, 2020);
- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (Wessex Archaeology on behalf of The Crown Estate, 2021);
- Curating the Palaeolithic (HE, 2023);
- Managing Change in the Historic Environment: Conserving Our Underwater Heritage (HES, 2025);
- Marine Geophysics Data Acquisition, Processing and Interpretation, Guidance Notes (2nd edition) (HE, 2025a);
- Scientific Dating of Pleistocene Sites (HE, 2025b);
- Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation (3rd edition) (HE, 2025c);
- Key Agencies Group National and Major Developments: An Agency Joint Statement on Pre-application Engagement (NatureScot, 2025);
- Historic Environment Circulars.

9.4.4 Baseline Data Sources

Desk study

- 9.4.4.1 The baseline assessment involved consultation of readily available archaeological and historical information from documentary and cartographic sources and repositories including (but not limited to):
- United Kingdom Hydrographic Office (UKHO) Wrecks, Obstructions and Fouls data, comprising records relating to charted wrecks and other seabed obstructions that are considered navigational hazards (UKHO, 2026).
 - HE's NMHR data, comprising marine heritage records that lie between MHWS and the 200 nautical mile sea limit (formerly held by the NRHE; this has been discontinued by HE and the records transferred into the relevant local authority HERs and the NMHR. NHRE records are held in Scotland, but none fall within the Marine and Intertidal Archaeology Study Area) (HE, 2026a).
 - HE's Intertidal and Coastal Peat Database, identifying submerged palaeolandscape peat deposits along England's coastline (no records within or in the vicinity of the Marine and Intertidal Archaeology Study Area) (HE, 2026b).
 - Durham County Council's Historic Environment Record (HER) (Durham County Council, 2026), holding archaeological and historic environment records for offshore, onshore and intertidal heritage assets in County Durham (including those formerly held by the NRHE).
 - Trove database (formerly Canmore) (HES, 2026a): archaeological and historic environment records for onshore and offshore heritage assets (predominantly records in Scotland and Scotland but also holds some records within England).
 - Coastal and Intertidal Zone Archaeological Network (CITiZAN) data (2026);
 - HM Government's list of wrecks designated under the Protection of Military Remains Act 1986 (digitised and available online via the government Marine Map portal) (HM Government, 2026);
 - British Geological Survey (BGS) GeoIndex Offshore (BGS 2026);
 - BGS Offshore Regional Reports (ORRs);
 - University of Sheffield (2026) BRITICE-CHRONO project data, which has information regarding the geomorphology (landforms) of the last British-Irish ice sheet.
 - Marine Environmental Data and Information Network (MEDIN) (2026): data relating to marine geology, geotechnical data and publicly accessible shipwrecks.
 - European Marine Observation and Data Network (EMODnet) (2026): data for sub-seabed palaeolandforms and palaeolandscapes.
 - Other secondary sources consulted include relevant literature from journals, publications and unpublished archaeological reports.

Site specific surveys

- 9.4.4.2 Preliminary, project-specific geophysical and hydrographic data was acquired over three campaigns.
- 9.4.4.3 Data was collected in 2022 within the area of the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South. MHPGC Project-specific survey data was collected in 2023 focussing on a range of offshore export cable route options (A-C) and associated landfall options (LF1-3), and 2024-2025 (hereafter 2024) within the MHPGC Project PEIR Red Line Boundary, excluding the area of the MHPGC PEIR Red Line Boundary that overlaps with Morven North and Morven South, from KP208 to KP0. The 2024 data covered the full extents of the MHPGC Project PEIR Red Line Boundary between KP208 and KP0, except for some nearshore areas between KP21 and KP0. Supplementary MBES data from 2023 were purchased by Morven Offshore Wind Limited (MvOWL) (hereafter 'the Applicant') to provide complete coverage of the MHPGC Project PEIR Red Line Boundary between KP21 and KP0.
- 9.4.4.4 For the purposes of the archaeological assessment, the 2023 MHPGC export cable route option surface data was superseded by the 2024 data, both in terms of resolution and coverage of the MHPGC Project PEIR Red Line Boundary. Thus, whilst the results may be referenced in a wider context, the 2023 data does not form part of the primary data source for the surface archaeological assessment within the MHPGC PEIR Red Line Boundary. However, the 2023 sub-

surface data has informed the assessment of the palaeolandscape outside of the MHPGC Project PEIR Red Line Boundary. The extents of the 2023 sub-surface data are shown on **Figure 9.4**.

- 9.4.4.5 The 2022 Morven North Offshore Wind Array Project and Morven South Offshore Wind Array Project data, the 2023 MHPGC export cable route option sub-surface data, the 2023 data purchased by the Applicant, and the 2024 MHPGC Project-specific survey data are collectively referred to within this Chapter (along with data accumulated by a walk-over survey at landfall; see below, **Paragraph 9.4.4.8**) as the 'site-specific survey data'. The extents of the geophysical and hydrographic site-specific survey data are illustrated by **Figure 9.4**. This was subject to archaeological assessment in relation to surface anomalies, magnetic anomalies and the palaeolandscape.
- 9.4.4.6 Primary geotechnical investigation was undertaken by the Applicant within the area of the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South, comprising Cone Penetration Tests (CPTs) in 2022 and boreholes in 2023. Primary geotechnical investigation of the MHPGC Project PEIR Red Line Boundary, outside of the section that overlaps with Morven North and Morven South, was undertaken in 2023, comprising CPTs only.
- 9.4.4.7 This baseline assessment has reviewed the interpretation and results reports of the aforementioned surveys, combining and refining the preliminary geophysical results. Reports reviewed for the assessment include:
- Gardline Ltd, 2022. Project Morven Integrated Site Survey. Report for bp Alternative Energy Investments Limited. Ref: 11779;
 - Hough, G. 2023. Technical File Note Preliminary Ground Model Morven Windfarm Development Central North Sea. JV EnBW/bp, Document No.: MV_5000080_01-00;
 - Norwegian Geotechnical Institute (NGI) 2024, Morven Offshore Wind Farm: Evaluation of Export Cable Routes. DOC.NO. 20230203-17-R;
 - Volume 2, Annex 3.1: Benthic Ecology Technical Report, Appendix A: XOCEAN Ltd. (2023) Geophysical Survey Report;
 - Volume 2, Annex 3.1: Benthic Ecology Technical Report, Appendix B: XOCEAN Ltd. (2025) Geophysical Survey Report.
- 9.4.4.8 Further primary data was acquired through a walkover survey of the intertidal zone at the Blast Beach Landfall location on 16 July 2026 (see above, **Figure 9.1**). The results of this survey, conducted between MLWS and MHWS within the MHPGC Project PEIR Red Line Boundary at the landfall, are detailed in **Paragraphs 9.4.5.759.4.5.77**. The results of the wider onshore archaeology walkover survey, conducted within the Onshore Archaeology and Cultural Heritage Study Area (which do not form part of this assessment) are detailed within **Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage**.

Data limitations and assumptions

- 9.4.4.9 The baseline for marine and intertidal archaeology was produced using data available and following industry best-practice guidance at the time of writing. The quality of project-acquired data was deemed suitable for the purposes of archaeological assessment.
- 9.4.4.10 Heritage record repositories constitute a record of known archaeological sites and remains. They do not constitute an exhaustive record of all surviving historic environment features and do not preclude the existence of further features which are unknown at present. Records indicative of potentially lost heritage asset, such as a UKHO 'dead' wreck (i.e. one not detected by repeat surveys) or demolished structure does not preclude the possibility of remains still being present.
- 9.4.4.11 Within the MHPGC Project PEIR Red Line Boundary, to the southwest of Morven North and Morven South (KP197 to KP208), data collection is confined to a 500m corridor. Data was not collected to the east and the west of the corridor, as such these areas were subject to archaeological assessment outside of desk-based sources (see **Figure 9.4**). Should the final route deviate outside of the 500m corridor, but within the MHPGC Project PEIR Red Line Boundary, further data collection will be undertaken and subject to archaeological assessment.
- 9.4.4.12 Vibrocores were only taken within Scottish waters, not English waters. CPT data only was acquired within English waters. Other sources were consulted to enhance the geoarchaeological

assessment, such as the detailed regional reports published by the BGS. Details of sources used can be found above, **Paragraph 9.4.4.1**.

9.4.5 Overview of baseline environment

- 9.4.5.1 This section presents a summary of the marine and intertidal archaeology baseline assessment. Full details of the methodology and assessment process can be found in **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**.

Summary of heritage assets within the Marine and Intertidal Archaeology Study Area

Designated heritage assets

- 9.4.5.2 Designated heritage assets comprise sites, structures and areas of significant cultural heritage importance to warrant protection and recognition under national policy. All or parts of designated assets may lie seaward of MHWS within the intertidal and marine zones. Such assets may comprise:
- Scheduled Monuments (England and Scotland);
 - Remains designated under the Protection of Military Remains Act 1986 (England and Scotland);
 - Protected Wrecks (England);
 - HMPAs (Scotland)
 - World Heritage Sites (England and Scotland);
 - Registered Battlefields (England and Scotland);
 - Listed Buildings (England and Scotland);
 - Properties in Care (Scotland);
 - Parks and Gardens (England) or Gardens and Designed Landscapes (Scotland);
 - Conservation Areas (England and Scotland).
- 9.4.5.3 As the Marine and Intertidal Archaeology Study Area extends to 200m above MHWS, there was therefore potential for designated assets located outside of the marine and intertidal zone to be included within the baseline assessment. Designated assets within the Marine and Intertidal Archaeology Study Area are outlined within this section.
- 9.4.5.4 There are no designated assets within the Marine and Intertidal Archaeology Study Area in Scottish waters.
- 9.4.5.5 There are seven designated heritage assets fully or partially within the Marine and Intertidal Archaeology Study Area in English waters, comprising Listed Buildings, a Conservation Area and protected wreck site as follows:
- Within 200m above MHWS
- Five Listed Buildings, comprising a statue (TI_003), police station (TI_005) (both c. 2.0km from the MHPGC Project PEIR Red Line Boundary), and part of a railway viaduct (TI_004; c. 600m from the MHPGC Project PEIR Red Line Boundary) and structural elements of Seaham North Dock (TI_001 and TI_002; c. 1.8km from the MHPGC Project PEIR Red Line Boundary).
- Seaward of MHWS
- The Seaham Conservation Area (OF_001), which extends from above MHWS to seaward of MHWS, encompassing all of Seaham Docks (extending to within c. 1.4km of the MHPGC Project PEIR Red Line Boundary); and the wreck of the Royal Fleet Auxiliary (RFA) *Creosol* (W_027), which is designated under the Protection of Military Remains Act 1986.
- 9.4.5.6 Of these designated assets, only the wreck of the RFA *Creosol* (W_027) is located within the MHPGC Project PEIR Red Line Boundary and located fully within the marine zone (i.e. seaward of MLWS).
- 9.4.5.7 W_027 is shown on **Figure 9.2**; all other designated assets are shown on **Figure 9.3**.

Non-designated heritage assets

- 9.4.5.8 Non-designated heritage assets comprise assets often of regional or local importance. Whilst they have the potential to contribute to understanding of the past, they have not been considered of the highest value to be formally designated under national policy, due to one or more factors. Others may remain undesignated due to their nature or location beyond 12nm but may demonstrate the attributes worthy of designation. Non-designated assets are weighed against all available evidence when assessing their significance within the scope of a proposed development, in line with current UK Government policy (DEFRA, 2020).
- 9.4.5.9 Excluding duplicated records within the datasets, the assessment has identified 502 non-designated assets within the Marine and Intertidal Archaeology Study Area, comprising:
- 203 wrecks and obstructions (16 listed as 'dead' locations);
 - 208 documented maritime losses;
 - 12 documented aircraft losses;
 - 79 other terrestrial, intertidal and offshore heritage assets.
- 9.4.5.10 These are summarised in more detail and according to location within English or Scottish jurisdiction amended below (Paragraphs 9.4.5.51 to 9.4.5.90). UKHO records and other non-designated assets comprising wrecks or possible wrecks are shown on **Figure 9.2**; terrestrial and intertidal non-designated assets are shown on **Figure 9.7**.
- 9.4.5.11 Archaeological review of the project-specific geophysical and hydrographic data from within the MHPGC Project PEIR Red Line Boundary identified 262 surface anomalies of potential archaeological interest within English and Scottish waters, comprising:
- 215 low potential anomalies;
 - 23 medium potential anomalies;
 - 24 high potential anomalies;
 - 1,170 magnetic anomalies of between 5.0nT and 1,056.0nT and with no definitive correlation with known or visible features or infrastructure.
- 9.4.5.12 These are summarised in more detail and according to location within English or Scottish waters below (**Paragraphs 9.4.5.65 to 9.4.5.73**). High and medium potential anomalies are shown on **Figure 9.5**, and magnetic anomalies are shown on **Figure 9.6**.
- 9.4.5.13 Twenty-one UKHO records have been actually or potentially correlated with 23 geophysical anomalies.
- 9.4.5.14 The intertidal walkover survey (**Figure 9.1**) did not record any features of archaeological significance in the survey area. Artefacts pertaining to recorded industrial dumping of waste on Blast Beach, or those translocated from overlooking spoil banks via erosion, were observed only. These are discussed in more detail below (**Paragraphs 9.4.5.75 to 9.4.5.77**).

Submerged prehistory

- 9.4.5.15 The North Sea region and its periphery contain prehistoric archaeological remains which date back to almost one million years ago, encompassing the known chronology of hominid activity in the British Isles. The earliest dated remains of hominid activity in Britain, dating to *Circa* (c.) 970,000 Before Present (years BP), were recovered from the intertidal zone at Happisburgh, Norfolk (Ashton *et al.*, 2014). Investigation of this site and others in the vicinity place them in a Middle Pleistocene palaeolandscape characterised by grassland, conifer forest, braided river systems and megafauna (Pathways to Ancient Britain, 2025). No similarly dated remains have been identified within a secure, Scottish context, where current evidence does not pre-date the Late Upper Palaeolithic (c. 12,500 BP) and this has only been attributed tentatively (Saville and Ballin, 2009).
- 9.4.5.16 A range of regional studies, both geologically and archaeologically focussed, have been undertaken over the past 60 years to develop understanding of the palaeogeography and how humans and human ancestors may have interacted with the palaeolandscapes of the North Sea. These studies have shown that the coastline along the northeast of Britain has the potential for

the presence of as-yet undiscovered *in situ* prehistoric sites, artefacts and deposits of palaeoenvironmental interest, located within the inundated nearshore and offshore palaeogeography. Palaeolandscape features such as lake deposits, tunnel valleys, palaeochannels, submerged peat and submerged forests have the potential to contain palaeoenvironmental and archaeological remains.

- 9.4.5.17 Interpretation of the site-specific survey data identified 12 Quaternary units within the MHPGC Project PEIR Red Line Boundary set out within **Table 9.7** below. Note that some units correspond within English and Scottish waters, but may have differing unit identification (ID), originating from the individual survey report relevant to each unit's identification within the relevant survey area.

Table 9.7: Identified Quaternary units within the MHPGC Project PEIR Red Line Boundary

English waters	Scottish waters
Hol (Holocene) 3	Surface Sediment (Hol 3)
Hol 2	Hol 2
Hol 1	Hol 1
Fth (Forth Formation) 3	Forth Formation (Fth 3)
Fth 2	(No equivalent)
Fth 1	(No equivalent)
MB (Marr Bank)	Marr Bank Formation
WB (Wee Bankie)	(No equivalent)
(No equivalent)	Coal Pit Formation
(No equivalent)	Fisher Formation
(No equivalent)	Ling Bank Formation
(No equivalent)	Aberdeen Ground Formation

Scottish waters

- 9.4.5.18 Quaternary sediment thickness in the Scottish parts of the MHPGC Project PEIR Red Line Boundary is generally between 5 to 50m. The Quaternary sequence within Scottish waters as mapped by Hough (2023) and NGI (2024) comprises (in descending order from the seabed):
- Surface Sediment/Hol 3
 - Hol 2;
 - Hol 1;
 - Forth Formation/Fth 3;
 - Marr Bank Formation;
 - Coal Pit Formation;
 - Fisher Formation;
 - Ling Bank Formation;
 - Aberdeen Ground Formation.
- 9.4.5.19 Whilst these formations appear within the areas of site-specific survey data coverage, some of these areas now lie beyond the MHPGC Project PEIR Red Line Boundary (**Figure 9.4**; see also above, **Paragraphs 9.4.4.39.4.4.7**). Within the MHPGC Project PEIR Red Line Boundary, to the southwest of Morven North and Morven South (KP197 to KP208) in Scottish waters, data collection is confined to a 500m corridor. Data was not collected to the east and the west of the corridor, as such these areas have not been subject to archaeological assessment outside of desk-based sources. Should the final route deviate outside of the 500m corridor, but within the MHPGC Project PEIR Red Line Boundary, further data collection will be undertaken and subject to archaeological assessment (CoT64) (see above, **Paragraph 9.4.5.18**).

- 9.4.5.20 The absence of the units MB and WB identified as the lowest along the offshore export cable corridor may be due to difficulties encountered in identifying the basal reflectors in Scottish waters, although Unit MB (Marr Bank Formation) has been mapped based on the 2D Ultra High-Resolution Seismic (UHRS) data.

English waters

- 9.4.5.21 Quaternary sediment thickness in the English parts of the MHPGC Project PEIR Red Line Boundary is varied, with thin sediment cover and exposed bedrock common near the coast (between KP0 and c. KP10), gradually thickening offshore to between 5 to 50m. The Quaternary sequence within English waters comprises (in descending order from the seabed):
- Hol 3;
 - Hol 2;
 - Hol 1;
 - Fth 3;
 - Fth 2;
 - Fth 1;
 - MB;
 - WB.

Glaciations and geomorphology

- 9.4.5.22 Glaciation models suggest that the Marine and Intertidal Archaeology Study Area was likely covered by ice during much of Marine Isotope Stage (MIS) 12 (487,000 to 424,000 BP), MIS 6 (191,000 to 123,000 BP) and, most recently, during MIS 2 (29,000 to 11,700 BP) and the Devensian Last Glacial Maximum (LGM; c. 27,000 BP) (see **Section 4.2.3 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**). From MIS 10 to 6 (374,000 to 123,000 BP; the Wolstonian Complex), a series of glacial advances and retreats occurred across the Marine and Intertidal Archaeology Study Area, with the most northerly parts most likely to have lain under ice. From MIS 5d to 5a (109,000 BP to 71,000 BP) and during MIS 3 (57,000 BP to 29,000 BP), the Marine and Intertidal Archaeology Study Area would likely have been ice free.
- 9.4.5.23 No geological deposits identified within English waters either by site-specific surveys or desk-based assessment pre-date the Devensian (MIS 5d to 2; 109,000 to 11,700 BP).
- 9.4.5.24 In Scottish waters, the Aberdeen Ground Formation, Ling Bank Formation and lower parts of the Fisher Formation were deposited during pre-Devensian glacial and interglacial periods, as were elements of the Coal Pit Formation.
- 9.4.5.25 The effects of the last glaciation are particularly prominent across the MHPGC Project PEIR Red Line Boundary. Key features mapped by NGI (2024), Hough (2023), Roberts *et al.* (2019) and EMODnet (2026) are:
- Moraines: Seabed moraines, marking the limits or recessional stages of former glaciers within the MHPGC Project PEIR Red Line Boundary. Large moraines are particularly common within the southern part of the MHPGC Project PEIR Red Line Boundary (e.g. KP116 to KP63), though moraine features are present throughout MHPGC Project PEIR Red Line Boundary (see Figure 4.9 within **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**).
 - Mega-scale glacial lineations (MSGL): linear, wide and shallow ridge and groove features formed by fast flowing ice streams in subglacial conditions. These are particularly prominent within English waters in the section of the offshore export cable between c. KP116 and KP63, but are also present throughout the MHPGC Project PEIR Red Line Boundary.
 - Other upstanding features including glacial ridges, drumlins, hummocks and mounds; and depressions including depressions and potential kettle holes are also present within the MHPGC Project PEIR Red Line Boundary.
 - Meltwater channels and valleys are also present (in some cases partially infilled by Late glacial and Holocene deposits).
 - Bedforms in the form of megaripples and sandwaves are present within some parts of the MHPGC Project PEIR Red Line Boundary.

- 9.4.5.26 The majority of these features are glacial landforms resulting from the Forth-Tay palaeo-ice stream, the southeast section of which passed through the offshore export cable corridor, leaving drumlins, moraines, grounding zone wedges, channels and other features (NGI, 2024).

Sea level modelling

- 9.4.5.27 Sea level studies and palaeo-coastline models were reviewed to determine when parts of the Marine and Intertidal Archaeology Study Area may have been subaerially exposed during periods of marine lowstand (University of Sheffield, 2026; Clark *et al*, 2022; Roberts *et al*, 2019; Shennan *et al*, 2018).
- 9.4.5.28 The northern and southern parts of the MHPGC Project PEIR Red Line Boundary in both English and Scottish waters may have been exposed but remained under arctic conditions, during a lowstand at c. 31,000 BP. After this, sea levels rose to a high point at c. 21,000 BP, likely witnessing submersion of the entirety of the MHPGC Project PEIR Red Line Boundary seaward of MHWS. Differences in ice loading and rebound affected the English and Scottish parts of the MHPGC Project PEIR Red Line Boundary differently, with the latter likely continually submerged after this high stand. Though sea levels lowered in Scotland during the Loch Lomond stadial (MIS 2; 12,900 BP to 11,700 BP), the water depth within the MHPGC Project PEIR Red Line Boundary in Scottish waters still indicates that the MHPGC Project PEIR Red Line Boundary was likely characterised by marine/glaciomarine conditions.
- 9.4.5.29 Sea level index point (SLIPS) slips from within Scottish waters show consistently raised relative sea level (RSL) between c. 21,000 BP and 7,500 BP, indicating that the northern parts of the Project PEIR Red Line Boundary in Scottish waters remained submerged over this entire period. Later sea level data demonstrates that sea levels remained slightly higher than today's levels until at least c. 4,000 and returned to current levels just after 2,000 BP.
- 9.4.5.30 In English waters, sea levels lowered after c. 21,000 BP, with a possible lowstand at c. 15,000 BP, which probably exposed the southernmost part of the MHPGC Project PEIR Red Line Boundary (to c. KP10) only. After this, sea levels rose again. The earliest SLIP from the area dates to c. 11,000 BP (i.e. just after the Loch Lomond stadial and at the beginning of the Holocene) and shows an RSL of -12.45m, dropping to -15.46m at 8,870 BP, and raising thereafter (c. -6.3m at c. 8,000 BP; c. 5m at 7,000 BP; c. 4 to 3m at 6,000 BP; -2m at 5,000 BP and <1m by 3,000 BP). Sea levels were therefore around their current level by c. 5,000 BP. Although RSL has not been demonstrated as consistent since 11,000 BP, the trend is generally one of sea level rise to present day levels. Either side of the highstand suggested around 6,000 BP, decreased RSL suggests the potential for nearshore elements of the MHPGC Project PEIR Red Line Boundary in English waters to have been characterised by sub-aerial environments during the Late Devensian and Holocene. These periods of lower RSL are suggested from 11,000 to 7,000 BP and 5,000 to 3,000 BP, correlating with the Mesolithic and Neolithic/Bronze Age archaeological periods, respectively.

Submerged prehistoric sites and artefacts

- 9.4.5.31 Within the Marine and Intertidal Archaeology Study Area, the Durham HER and NMHR hold records for approximately 70 flint artefacts of Mesolithic date that have been recovered from just seaward of MLWS (a further large scatter is recorded above MHWS, possibly having extended into the intertidal zone) (see **Section 4.5.5 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**). The majority of these finds are located some 1km south of the landfall and possibly translocated to seaward of MLWS during the operation of a cliff top colliery (all non-wreck related assets are shown on **Figure 9.7**; see also **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR, Appendix C: Gazetteer of heritage asset records**). Despite being likely *ex situ*, they remain indicative of local Mesolithic activity coinciding with the period during which formerly sub-aerial landscape existed in English waters up to c. KP10. HE's North East Rapid Coastal Zone Assessment (NERCZA) also records other large assemblages along the coastline to the south, the closest being c. 3.5km from the Marine and Intertidal Archaeology Study Area where over 550 artefacts of Mesolithic date were recovered (Archaeological Research Services (ARS), 2008). Associated Units Fth 3 and Fth 2 may have been partly deposited during the Mesolithic period, within environments attractive to human occupation. There is some potential for *in situ* remains in English nearshore waters.

9.4.5.32 Elsewhere, a broad potential is considered for *ex situ* artefacts, eroded from their primary depositional context. Given the gradual inundation of the formerly sub-aerially exposed landscape up to c. 5,000 BP, there is some potential for *in situ* remains of Neolithic date. However, there are no finds of Neolithic date within the Marine and Intertidal Archaeology Study Area. Within the wider coastal region, the evidence outlined within the NERCZA is also much lower than that of the Mesolithic, comprising only occasional flint finds (rather than scatters) and an enclosure monument located approximately 10km northwest of the Marine and Intertidal Archaeology Study Area (ARS, 2008). The potential for Neolithic finds to be present is therefore still lower than that for the Mesolithic, if slightly higher than that for the Palaeolithic due to the more amenable environmental conditions within the English nearshore.

9.4.5.33 A summary of submerged prehistoric archaeological potential is presented below, within **Table 9.8** and **Table 9.9**.

Geoarchaeological assessment

9.4.5.34 Geoarchaeological assessment of boreholes collected from within the area of the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South was undertaken. The results demonstrated a low geoarchaeological potential for deposits (MSDS Marine, 2025) and no further geoarchaeological work was recommended in Scottish waters (see also below, **Table 9.6**; and **Section 4.2.2 of Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**).

9.4.5.35 The key area of geoarchaeological and palaeoenvironmental interest is within English nearshore waters (to c. KP10). The geoarchaeological assessment in this area and the MHPGC Project PEIR Red Line Boundary in English waters, was informed by CPTs only, which provide limited data for this type of assessment but was considered suitable for the archaeological assessment, as detailed within Section 3.6 in **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**.

9.4.5.36 Should further geotechnical investigation and sampling be undertaken, these will be subject to archaeological assessment (CoT64).

Summary of archaeological potential

9.4.5.37 Most identified units have been provisionally interpreted as marine or glaciomarine in origin, thus precluding the potential for *in situ* archaeological remains relating to prehistory prior to or during the Holocene marine transgression.

Aberdeen Ground, Ling Bank, Fisher and Coal Pit Formations

9.4.5.38 Geoarchaeological assessment of samples from 12 boreholes collected from within that section of the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South found evidence that most deposits attributable to these formations related to glacial/proglacial and glaciomarine/marine environments. The assessment therefore concluded that there is low potential for archaeological remains to be present.

Wee Bankie and Marr Bank Formations

9.4.5.39 Within the MHPGC Project PEIR Red Line Boundary, the Wee Bankie and Marr Bank Formations provide evidence of the Devensian LGM, demonstrating sub-glacial deposition. The Wee Bankie Formation is a sub-glacial deposit, with no potential for *in situ* remains to be present, but low potential for translocated artefacts. Assessment of cores from the area of the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South suggests that the Marr Bank Formation deposits were indicative of inhospitable proglacial and possibly shallow glaciomarine environments. The potential for archaeological remains to be present is also therefore assessed as low and confined to translocated artefacts.

Forth Formation

9.4.5.40 For the most part, Forth Formation deposits are assessed to have been deposited within marine and glaciomarine environments where the archaeological potential is low and likely to consist of translocated artefacts. However, elements of the upper deposits (Fth 2 and Fth 3) may have been deposited within Early Holocene, fluviomarine and estuarine environments, both conducive and

attractive to human occupation. Sea level studies indicate that the southern section of the MHPGC Project PEIR Red Line Boundary in English waters (out to c. KP10) was sub-aerially exposed from approximately 15,000 to 7,000 BP (a period exhibiting gradual encroachment) and again from 5,000 to 3,000 BP (to a lesser extent and witnessing a coastline between KP0 to KP10). These periods of lower RSL correlate with the Mesolithic and Neolithic/Bronze Age archaeological periods.

- 9.4.5.41 Large scatters of Mesolithic artefacts have been recorded within the southern part of the Marine and Intertidal Archaeology Study Area at the landfall, as well as within the wider coastal region to the south by the NECZRA (ARS, 2008). There is therefore potential for *in situ* as well as *ex situ* remains within the English nearshore and a locally moderate potential has been attributed to Units Fth 2 and Fth 3 within the English nearshore.

Holocene Units Hol 1, 2 and 3 / Surface Sediments

- 9.4.5.42 These units were deposited under marine conditions throughout the Holocene. Reworking of the underlying Units Fth 2 and Fth 3 within the English nearshore may have eroded prehistoric artefacts from within, which may now be held with the Holocene marine sediments. As the process of inundation was gradual, prehistoric groups may have utilised the intertidal zone as this gradually shifted landward and may have left evidence within the marine sediments. The potential for remains to be present is assessed as low, with a slight potential for both *in situ* and *ex situ* finds.

Summary of geoarchaeological potential

- 9.4.5.43 Geotechnical investigation to date involving the acquisition of sample material has only covered Scottish waters. As noted above, whilst the assessment for the remainder of the MHPGC Project PEIR Red Line Boundary in English waters is based on the more limited data provided by CPTs only, this was considered sufficient to inform the archaeological assessment as detailed within Section 3.6 in **Volume 2, Annex 9.1: Marine and Intertidal Archaeology Technical Report, of the PEIR**.

Aberdeen Ground, Ling Bank, Fisher and Coal Pit Formations

- 9.4.5.44 Geoarchaeological assessment of available boreholes concluded that these deposits related to glacial/proglacial and glacio-marine/marine environments with limited potential for scientific dating (MSDS Marine, 2025). The geoarchaeological potential for these units has therefore been assessed as low.

Wee Bankie and Marr Bank Formations

- 9.4.5.45 As the Wee Bankie Formation is a sub-glacial deposit, the geoarchaeological potential is considered to be low for this unit. Assessment of cores from the area of the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South suggests that the Marr Bank Formation deposits possibly in part were the result of glaciomarine deposition. Within these deposits, shell was identified, however, the remains were highly fragmented and unsuitable for further dating. Given this depositional environment, a general geoarchaeological potential remains, but the geoarchaeological work to date suggest this to remain low (MSDS Marine, 2025).

Forth Formation

- 9.4.5.46 For the most part, the Forth Formation deposits are thought to have been deposited within marine and glaciomarine environments and the geoarchaeological potential judged to be low. However, the elements of the Fth 2 and Fth 3 units which could represent fluviomarine and estuarine depositional environments and be associated with the area of sub-aerially exposed land within c. KP10 suggests locally moderate potential associated with these deposits.

Holocene Units Hol 1, 2 and 3 / Surface Sediments

- 9.4.5.47 These units represent the latest Quaternary marine units, and within the formerly sub-aerially exposed area of the English nearshore, the marine inundation. In general, such non-glacigenic deposits hold a broad low potential for evidence such as diatoms, ostracods and dinoflagellates which might infer palaeoenvironmental conditions. Post-marine transgression Holocene marine deposits typically hold a low potential for *in situ* palaeoenvironmental evidence. Vibrocore (VC)

samples examined within the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South supports this general conclusion, however, the remainder of the MHPGC Project PEIR Red Line Boundary has not been sampled by geotechnical investigation.

- 9.4.5.48 Locally moderate potential has been attributed to any elements of the Forth Formation deposits (Unit Fth 2 and Unit Fth 3) found to have been deposited within non-marine environmental conditions within c. KP10 within English waters.
- 9.4.5.49 Whilst there is some potential identified for Marr Bank Formation/MB deposits, found to contain fragmentary shell, this is still considered to be low, based upon previous experience of similar deposits.
- 9.4.5.50 In general, non-glacigenic deposits hold a broad low potential for evidence such as diatoms, ostracods and dinoflagellates which might infer palaeoenvironmental conditions.

Table 9.8: Units identified within the Sub-Bottom Profiler (SBP) and geotechnical data within the MHPGC Project PEIR Red Line Boundary that overlaps with Morven North and Morven South

Unit name	Character and lithology	Age	MSDS interpretation	Archaeological potential	Geoarchaeological potential
Surface Sediment	Surface sands, with thickness ranging from 0m to 10m (thickest in areas where sandwaves are present).	Holocene (Marine Isotope Stage (MIS) 1)	Marine.	Low	Low
Forth Formation	Channel fill deposits, between 10m to 60m deep, up to 3km wide. Irregular basal surface with a high amplitude reflector possibly indicating cobble basal lag deposit. CPT investigations refused at this depth also indicating a hard surface. Shallow braided channels are also present with a different seismic character.	Devensian/Holocene (MIS 1 to 2)	Glacial to marine.	Low	Low
Marr Bank Formation	Sheet like deposit, between 10m to 30m thick, though maximum of 65m and minimum of 0m. Acoustic character ranges from amorphous to parallel bedded indicating glacial outwash, with likely cross bedding of sand bars. The basal reflector is strong and bright indicating a cobble or boulder rich layer. Basal tills (deposited as an unstratified deposit) are present in some areas.	Devensian	Glacial to proglacial outwash plains.	Low	Low
Coal Pit Formation	The formation is present primarily as a channel and infill deposit, up to 130m deep, cutting down to bedrock in places. The channel bases have an irregular erosion surface and a chaotic/structureless fill. High amplitude reflectors in the base may represent shells or pebbles of the lower coal pit (tested in BGS BH 81/37)	MIS 6 to 3	Marine to glaciomarine, with potential for intertidal deposits in the Ipswichian.	Low	Low
Fisher Formation	Acoustic character of the Fisher Formation typically includes parallel sub-horizontal reflectors with small intraformational channels in seismic section. It is thought that this unit is present within the MHPGC Project Peir Red Line Boundary, but not yet fully mapped.	MIS 10 to 6	Sub-glacial to glaciomarine.	Low	Low
Ling Bank Formation	Acoustic character of the Ling Bank typically appears as a complex, stacked, concave-up, commonly irregular, curved seismic reflectors, with evidence of channels and infills that have an amorphous seismic signature. It is thought that this unit is present within the MHPGC Project PEIR Red Line Boundary, but not yet fully mapped.	MIS 12 to 10	Arctic glacial to marine interglacial conditions.	Low	Low
Aberdeen Ground Formation	Wedge shaped deposit. Upper parts of the formation are present within the MHPGC Project PEIR Red Line Boundary (proved at BGS BGH 81/27); however, the unit is not yet fully mapped.	Early to middle Pleistocene (MIS 100 to 13)	Varied (often glacial), but predating earliest evidence of human activity in Scotland.	Low	Low

Table 9.9: Units identified within the SBP and geotechnical data within the MHPGC Project PEIR Red Line Boundary in English and Scottish waters (excluding the section that overlaps with Morven North and Morven South.

Base horizon	Jurisdictional relevance	Seismic character	Lithology	CPT response (corrected cone tip resistance (qt))	Interpretation (NGI 2024)	Correlation with Roberts et al. 2019 facies	Age	MSDS interpretation	Archaeological Potential	Geoarchaeological Potential
Hol 3	England and Scotland	Moderate to low amplitude reflector, with chaotic continuity	Mainly loose to medium dense, gravelly sand with local clay.	Low (0 Megapascal (MPa) to 10MPa)	Marine: Mobile sand. Evidence of sand waves.	Acoustic Facies (AF) 5	Holocene	Marine sediments, potential for redeposited remains	Low	Low
Hol 2	England and Scotland	Low to moderate amplitude reflector, with transparent to semi-continuous character, draping over lower sediments and thicker in depressions.	Loose to medium dense sand, with local clay	Low (0MPa to 10MPa)	Marine: sheet deposits indicative of hemipelagic (offshore) sedimentation				Low	Low
Hol 1	England and Scotland	High to moderate basal reflector, continuous to semi continuous reflections, draping with variable thickness	Loose to medium dense sand, with local clay	Low (0MPa to 15MPa)	Marine: infill depression (high amp)				Low	Low
Fth 3	England and Scotland	Moderate to low amplitude basal reflector, with continuous to semi continuous and transparent reflections. Geometry indicates channel infill with overbank sedimentation	Dense to very dense fine to medium sand	Moderate (5MPa to 25MPa)	Forth Formation: Marine, glacio-marine, fluvio-marine, estuarine	AF4	Devensian potentially to Holocene	Archaeological potential focused in nearshore areas, English waters. Also, potential for redeposited remains.	Low to locally Moderate (within the English nearshore)	Low to locally Moderate (within the English nearshore)
Fth 2	England		Extremely low to low strength slightly sandy clay and clayey sand	Extremely low to low (≤ 2 MPa)					Low to locally Moderate (within the	Low to locally Moderate (within the

Base horizon	Jurisdictional relevance	Seismic character	Lithology	CPT response (corrected cone tip resistance (qt))	Interpretation (NGI 2024)	Correlation with Roberts <i>et al.</i> 2019 facies	Age	MSDS interpretation	Archaeological Potential	Geoarchaeological Potential
									English nearshore)	English nearshore)
Fth 1	England	Low to moderate basal reflector with transparent to semi continuous reflections. Geometry indicates channel infill	Dense to very dense sand, possible channel flank slump deposits	Moderate (5MPa to 20MPa)				Potential for redeposited remains.	Low	Low
MB	England	Moderate to low amplitude basal reflector, with semi continuous to transparent internal reflectors, and a prograding geometry	Dense to very dense fine to medium sand often with beds of medium to high strength clay with gravels, cobbles and boulders.	Moderate (5MPa to 25MPa)	Marr Bank: Marine to glaciomarine. Sheet-like outwash deposits	-	Devensian	Low archaeological potential	Low	Low
WB	England	Low amplitude basal reflector with transparent internal reflectors, with a varied geometry indicating sedimentation and local ridges.	Medium dense to very dense, gravelly clay and sand; very heterogenous in grain size; stiff, variably matrix-dominated polymictic till with some interbeds of sand, pebbly sand and silty clay	Moderate (5MPa to 25MPa)	Wee Bankie: Terminal and subglacial till	AF3/AF2		Low archaeological potential	Low	Low

Coastal and maritime archaeology

- 9.4.5.51 Coastal and maritime cultural remains can be broadly defined as evidence of “human utilisation of maritime space by boat, settlement, fishing, hunting, shipping and its attendant subcultures, such as pilotage, lighthouse and seamark maintenance” (Westerdahl, 1992). Remains considered range from shipwrecks or other durable evidence, such as cargo and ballast, to features including navigational aids, sailing marks, ports, harbours and jetties. Navigational hazards such as shallow reefs or sand banks influence archaeological potential (particularly for wrecks), as does the preservation environment. All can inform understanding of the archaeological potential.
- 9.4.5.52 Other coastal remains which do not necessarily relate to boat use are also considered, including fish traps and other evidence of human interaction with the sea. In addition, other coastal features are reported on where they inform the archaeological potential of the Marine and Intertidal Archaeology Study Area, such as eroded remains from nearby coastal features or settlements.
- 9.4.5.53 Maritime archaeological sites within the present marine environment generally comprise two categories:
- The remains of vessels that have been lost by stranding, foundering, collision, enemy action and other causes;
 - Those sites that consist of vessel-related material.
- 9.4.5.54 Vessel-related material can include (but is not limited to):
- Equipment lost overboard or deliberately jettisoned, such as fishing gear, ammunition and anchors;
 - The only surviving remains of a vessel, such as its cargo or ballast mound.
- 9.4.5.55 Shipwrecks on the seabed provide an insight on the types of vessels used in the past, the nature of shipping activity in the wider area and the changing usage of the marine environment through different periods. Such remains are considered more likely to survive in sediments which promote the preservation of wreck sites (e.g., finer grained sediments that are not subject to high levels of mobility).

Designated heritage assets

Scottish waters

- 9.4.5.56 There are no designated heritage assets within the Marine and Intertidal Archaeology Study Area in Scottish waters.

English waters

- 9.4.5.57 There are seven designated heritage assets in the Marine and Intertidal Archaeology Study Area in English waters, comprising:
- Five Grade II Listed Buildings located within the 200m buffer above MHWS;
 - Part of the Seaham Conservation Area (extends from the terrestrial to the slightly seaward of MLWS, encompassing all of Seaham Docks);
 - One wreck designated under the Protection of Military Remains Act 1986, which is that of the RFA *Creosol*; MSDS ID: W_027).
- 9.4.5.58 Of these designated assets, only the remains of the RFA *Creosol* (MSDS ID: W_027) is within the MHPGC Project PEIR Red Line Boundary.
- 9.4.5.59 W_027 is shown on **Figure 9.2**; all other designated assets are shown on **Figure 9.3**.

Non-designated heritage assets

- 9.4.5.60 There are 65 UKHO records within the Marine and Intertidal Archaeology Study Area for non-designated remains (this total excludes the record for the designated remains of the RFA *Creosol* discussed above):
- 12 in Scottish waters;
 - 41 in English waters within 12nm;
 - 12 in English waters beyond 12nm.

9.4.5.61 There are 35 Trove records within the Marine and Intertidal Archaeology Study Area comprising:

- 22 wreck records, of which 20 correlate with UKHO records;
 - 13 in Scottish waters;
 - Nine in English waters beyond 12nm (none within 12nm);
- 13 documented loss records, of which four also correlate with UKHO wreck records.

9.4.5.62 There are 379 NMHR non-designated records within the Marine and Intertidal Archaeology Study Area (all within English waters):

- 39 wreck records, of which 38 correlate with UKHO records (total excludes the NMHR record for the designated remains of the RFA *Creosol*):
 - 37 within 12nm;
 - Two beyond 12nm;
- 138 records of unknown obstructions:
 - 134 within 12nm;
 - Four beyond 12nm;
- 186 documented loss records;
- Ten documented aircraft loss records;
- Six records for non-wreck/obstruction assets within the offshore and terrestrial zones:
 - A Mesolithic findspot comprising three lithic artefacts;
 - A colliery site;
 - Three sites relating to World War Two defences;
 - Seaham North Dock.

9.4.5.63 There are 168 non-designated Durham HER records within the Marine and Intertidal Archaeology Study Area:

- Ten wreck records, of which eight correlate with UKHO and NMHR records, and all of which are within 12nm (total excludes the HER record for the designated remains of the RFA *Creosol*);
- 34 records for unidentified obstructions, of which 31 correlate with NMHR records;
- 44 documented maritime loss records, of which 33 correlate with NMHR records;
- Two documented aircraft losses;
- 78 non-wreck or obstruction related offshore, intertidal and terrestrial assets ranging in date from the Mesolithic to the Modern periods (six that correspond with NMHR records and excluding three records that correlate with HE designated assets and the Seaham Conservation Area). Nine of these records are located seaward of MLWS:
 - Six flint findspot records of Mesolithic date;
 - Three associated with elements of Seaham Dock and anchorage, including the lighthouse.

9.4.5.64 UKHO records and other non-designated assets comprising wrecks or possible wrecks are shown on **Figure 9.2** and terrestrial and intertidal non-designated assets are shown on **Figure 9.7**.

Geophysical anomalies of archaeological potential

9.4.5.65 The assessment of geophysical data identified 262 surface anomalies of potential archaeological interest, comprising 215 low, 23 medium and 24 high potential anomalies. The distribution of high and medium potential anomalies, identified as likely wrecks or possible wrecks, are shown on **Figure 9.5**.

Scottish waters

9.4.5.66 Identified geophysical anomalies with archaeological potential in Scottish waters comprise:

- 159 low potential anomalies;
- 12 medium potential anomalies;
- Five high potential anomalies.

English waters

9.4.5.67 Identified geophysical anomalies within English waters comprise:

- 56 low potential anomalies;
- 11 medium potential anomalies;

- 19 high potential anomalies.

9.4.5.68 There were 23 geophysical anomalies that could be actually or potentially correlated with 21 UKHO wreck records.

Scottish waters

9.4.5.69 Four high potential geophysical anomalies in Scottish waters were correlated with the following wrecks:

- MOR23_052: unknown wreck, W_002;
- MOR23_015: unknown wreck, W_062;
- MOR23_071: unknown wreck, W_063;
- MOR23_054: unknown wreck, W_064.

9.4.5.70 The remaining high potential anomaly and all medium potential anomalies in Scottish waters were not correlated with UKHO records.

English waters

9.4.5.71 Seventeen high potential geophysical anomalies were correlated with UKHO wrecks records in English waters. In addition, two medium potential anomalies were also potentially correlated with two of those wrecks, interpreted as possibly representing associated debris:

- MEC25_022: wreck; possibly the *John M. Smart*, W_012;
- MEC25_131: wreck; possibly the *Hans Hoth*, W_013;
- MEC25_070: unknown wreck, W_017;
- MEC25_139: wreck; possibly the *Helvetia*, W_020;
- MEC25_116: wreck; possibly the *Vianna*, W_023;
- MEC25_124: wreck; probably the *Carmarthen Coast*, W_024; and MEC25_135: possibly associated debris;
- MEC25_136: wreck; possibly the *Carmarthen Coast*, W_025;
- MEC25_137: designated wreck of the RFA *Creosol*, W_027;
- MEC25_138: wreck of the *Intent*, W_028;
- MEC25_140: unknown wreck, W_034;
- MEC25_053: wreck of the *Hogarth*, W_039; and MEC25_057: possibly associated debris;
- MEC25_052: wreck; possibly the *Zeeland*, W_040;
- MEC25_132: unknown wreck, W_044;
- MEC24_115: wreck, probably the *Teal*, W_048;
- MEC25_005: unknown wreck, W_056;
- MEC25_054: unknown wreck, W_060;
- MEC25_133: wreck, possibly the *Teal*, W_061.

9.4.5.72 Two high potential anomalies and nine medium potential anomalies were not correlated with UKHO records.

Magnetic anomalies

9.4.5.73 A total of 1,170 magnetic anomalies of between 5.0 and 1,056.0nT, with no definitive correlation with known or visible features or infrastructure, were also identified. Of these, 959 were in Scottish waters, and 211 in English waters.

9.4.5.74 The distribution of magnetic anomalies is shown on **Figure 9.6**.

Intertidal walkover survey

9.4.5.75 The intertidal survey did not record any features of archaeological significance in the survey area. Artefacts pertaining to recorded industrial dumping of waste on Blast Beach, or those translocated from overlooking spoil banks via erosion, were observed only.

9.4.5.76 Larger elements of detritus comprised masonry concrete blocks, and iron objects; the latter of either structural origin or perhaps relating to more specific industrial activity such as containers or associated with combustion. These were situated close to the spoil banks, where similar objects were discernible in the exposed and partly eroded seaward-facing sections.

- 9.4.5.77 Elsewhere, smaller artefacts such as ceramic brick material (CBM) and glass were scattered along the beach, with the latter most prevalent.

Summary

- 9.4.5.78 Whilst most of the heritage records from within the Marine and Intertidal Archaeology Study Area date relate to post-medieval and modern activity, there is evidence suggestive of activity pertaining to earlier periods, particularly the Mesolithic and medieval periods.

Palaeolithic, Mesolithic and Neolithic

- 9.4.5.79 Evidence for the prehistoric periods within the Marine and Intertidal Archaeology Study Area is confined to the Mesolithic period and consists of a large number of flint artefacts recovered from the sub-tidal, intertidal and terrestrial zones. This coincides with the geoarchaeological and sea level evidence for deposits representing formerly sub-aerially exposed landscape attractive for settlement up to c. KP10 within the English nearshore. Subsequent inundation of this area occurred gradually, with sea levels stabilising around their approximate present-day level by the Bronze Age (c. 1,000 BC). However, there are no records of evidence for Neolithic or Bronze Age activity within the Marine and Intertidal Archaeology Study Area and only limited remains known within the wider coastal region (ARS, 2008). No identified remains of Palaeolithic date have been recorded, and earlier geological deposits consist of glacial/glaciomarine environments not conducive to human occupation.
- 9.4.5.80 There is therefore considered to be very low potential for remains of Palaeolithic date to be present, and low for Neolithic. These are likely to consist of translocated artefacts, although there is some potential for *in situ* remains of Neolithic date in the English nearshore where marine inundation was gradual. The potential for Mesolithic remains to be present is also considered to be low in general, but with locally moderate potential within the English nearshore (up to c. KP10) for *in situ* and *ex situ* remains.

Bronze Age, Iron Age and Roman

- 9.4.5.81 There are no records of Bronze Age, Iron Age or Roman findspots or sites within the Marine and Intertidal Archaeology Study Area. Whilst there is broader evidence for a general increase in the capabilities and employment of maritime craft, particularly by the Roman period, no evidence has been recorded. Activities are likely to have been confined to the nearshore, with coastal maritime traffic and foraging, the latter less likely to leave traces within the archaeological record. The potential for archaeological remains of Bronze Age, Iron Age or Roman date to be present is therefore considered to be very low.

Early medieval and medieval

- 9.4.5.82 There is no evidence for early medieval activity in the Marine and Intertidal Archaeology Study Area and medieval activity is centred on the historic core of Seaham (pre-dating the development of the harbour) and associated agricultural activity within the hinterland. However, documentary evidence for the increase in regional and continental maritime trade during the medieval period along the east coast of England and Scotland, suggests an increased potential for medieval remains to be present. It is therefore considered that there is very low potential for early medieval and low potential for medieval remains to be present.

Post-medieval and modern

- 9.4.5.83 The UKHO and heritage records present a broad view of historic use of the Marine and Intertidal Archaeology Study Area and, more widely, the North Sea. The types of vessel represented by the loss records indicate activities such as fishing, transportation and defence were undertaken, principally during the 19th and 20th centuries, although there are also 22 documented loss records for the 18th century and one for the 17th century.
- 9.4.5.84 There is also strong evidence for increased maritime activity associated predominantly with the coal industry, eventually emanating in part from Seaham Harbour within the Marine and Intertidal Archaeology Study Area north of the MHPGC Project PEIR Red Line Boundary. Evidence of these activities may be present within the MHPGC PEIR Red Line Boundary, as exemplified by 21 UKHO records correlated with geophysical anomalies. Remains relating to historic maritime activity may also be encountered within the intertidal zone, and with discarded industrial material from terrestrial sites very likely to be encountered.

- 9.4.5.85 The potential for archaeology of post-medieval date to be encountered is assessed as moderate to high, with the higher potential being within the English nearshore where there are a higher number of records and evidence for local, regional and international maritime trade routes passing across the Marine and Intertidal Archaeology Study Area. The potential for the modern period is high.

Aviation Archaeology

- 9.4.5.86 Marine aviation archaeology assets comprise the remains, or associated remains, of military and civilian aircraft that have been lost at sea. Evidence is divided into three primary time periods, based on major technological advances in aircraft design:
- Pre-1939;
 - 1939-1945;
 - Post-1945.
- 9.4.5.87 Maritime aircraft crash sites can retain a significant amount of material and, although these can be difficult to identify and remains may be dispersed and/or buried. Any aircraft remains would be automatically protected under the Protection of Military Remains Act 1986.
- 9.4.5.88 There are no known aviation remains within the Marine and Intertidal Archaeology Study Area.
- 9.4.5.89 There are twelve documented loss records for aircraft within the Marine and Intertidal Archaeology Study Area, all within 12nm in English waters and dated to the Second World War. These records relate to broad areas or arbitrary coordinates rather than exact locations pertaining to physical remains. In addition, the traumatic mechanism of aircraft crashes means that any debris may have travelled either on the surface or laterally through the water column before settling on the seabed. As such, physical remains are unlikely to be present at any given location.
- 9.4.5.90 However, the documented loss records, considered alongside the nearby aerodrome at Royal Air Force (RAF) Usworth, operating between 1916 and 1958, are indicative of significant wartime activity in the locality of the 12nm limit in English waters. There is therefore considered to be low to moderate potential for aircraft remains to be present within the Marine and Intertidal Archaeology Study Area, with the greater potential being within the 12nm limit within English waters.

9.4.6 Future baseline conditions

- 9.4.6.1 During the 35-year operational lifetime of the MHPGC Project, the marine and intertidal archaeology baseline can be expected to evolve both on a natural basis and in response to global trends such as climate change and other anthropogenic activities. The Infrastructure Planning (EIA) Regulations 2017, the Marine Works (Environmental Impact Assessment) Regulations 2007 and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 require that "an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge" is included. Therefore, an assessment of future baseline conditions, in the absence of the MHPGC Project, has been undertaken and is described within this section.
- 9.4.6.2 The existing environment for marine and intertidal archaeology has been shaped by a combination of factors, with the most prevalent being changes in global sea levels and associated climatic and environmental conditions in both English and Scottish waters. These conditions have and will continue to affect the burial and preservation of remains.
- 9.4.6.3 Marine physical processes, including the cycle of burial and exposure due to storm events, have an ongoing effect on the preservation of archaeological material. Sediment cover provides protection from physical marine processes, reducing the risk of erosion and degradation. It is not possible to assess the effect of this impact upon individual heritage assets, as this will be dependent on the nature of the exposed heritage asset and site-specific conditions. The potential increase and violence of storm activity because of climate instability may exacerbate the effects of the burial and exposure cycle on affected assets.

- 9.4.6.4 Underwater cultural heritage is also under threat from warming waters caused by climate change. As the sea levels rise, the impact of the tidal activity on heritage assets within and adjacent to the intertidal zone will increase. In addition, warming waters result in the northward migration of invasive species and may include the blacktip shipworm (*Lyrodus pedicellatus*) and great shipworm (*Teredo navalis*). These species are a major threat to wooden wrecks and other wooden structures within the marine environment.
- 9.4.6.5 Further marine infrastructure projects within the region will all have the potential to cause adverse impacts on heritage assets or contribute to beneficial impacts. This includes large-scale enhanced understanding of the archaeological resource through large area geophysical/geotechnical survey data released to the public domain or the enhanced knowledge of key characteristics, features or elements derived from site-specific survey and investigations. This is particularly relevant to the study of submerged palaeolandscapes, which may experience limited overall impacts from seabed development on a project-by-project basis but benefit from the accumulation and analysis of geotechnical data and subsequent geoarchaeological review from a range of projects. There is the potential for loss or disturbance of possible historic wreck sites arising from discovery and other marine infrastructure projects, however, these are routinely protected from likely impacts by robust, industry-standard mitigation strategies.

9.4.7 Summary of baseline

Submerged prehistory

- 9.4.7.1 Twelve Quaternary units have been identified within the MHPGC Project PEIR Red Line Boundary and have been correlated with known geological units. The archaeological and geoarchaeological potential for these units has been assessed as follows:

Table 9.10: Summary of archaeological and geoarchaeological potential of Quaternary units identified in Scottish waters

Unit ID	Archaeological Potential	Geoarchaeological potential
Surface Sediment (Hol 3)	Low	Low
Hol 2	Low	Low
Hol 1	Low	Low
Forth Formation (Fth 3)	Low	Low
Marr Bank Formation	Low	Low
Coal Pit Formation	Low	Low
Fisher Formation	Low	Low
Ling Bank Formation	Low	Low
Aberdeen Ground Formation	Low	Low

Table 9.11: Summary of archaeological and geoarchaeological potential of Quaternary units identified in English waters

Unit ID	Archaeological Potential	Geoarchaeological potential
Holocene Sediment 3 (Hol 3)	Low	Low
Hol 2	Low	Low
Hol 1	Low	Low
Forth Formation 3 (Fth 3)	Low to locally Moderate within the English nearshore	Low to locally Moderate within the English nearshore
Fth 2	Low to locally Moderate within the English nearshore	Low to locally Moderate within the English nearshore
Fth 1	Low	Low
Marr Bank Formation (MB)	Low	Low
Wee Bankie Formation	Low	Low

- 9.4.7.2 Units Fth 2 and Unit Fth 3 have been identified as having greater archaeological potential between c. KP0 and KP10 because they extend close to formerly subaerially exposed landscape and were possibly deposited in fluvio-estuarine conditions attractive to human groups.

Coastal and maritime archaeology

Designated heritage assets within the Marine and Intertidal Study Area.

- 9.4.7.3 There are no designated assets within Scottish waters and seven in English waters. Only one is within the MHPGC Project PEIR Red Line Boundary, which is a wreck designated under the Protection of Military Remains Act, 1986 (RFA *Creosol*; W_027). W_027 is shown on **Figure 9.2**; all other designated assets are shown on **Figure 9.3**.

Non-designated assets within the Marine and Intertidal Study Area

- 9.4.7.4 Excluding duplicated records, the assessment has identified 502 non-designated assets, of which 203 consist of wrecks, possible wrecks or obstructions. The remainder comprise documented maritime and aviation losses and archaeological finds and features of Mesolithic to the Modern period.

Non-designated assets in Scottish waters

- 9.4.7.5 The following non-designated asset records are located within Scottish waters:

- 12 UKHO records;
- 13 Trove wreck records (of which 12 correlate with UKHO records);
- Nine documented loss records.

Non-designated assets in English waters

- 9.4.7.6 The following non-designated asset records are located within English waters:

- 47 UKHO records;
- 379 NMHR records, comprising:
 - 39 wreck records (38 correlating with UKHO records);
 - 138 records of unknown obstructions;
 - 186 documented loss records;
 - Six other records comprising a Mesolithic findspot, colliery site, Second World War defences and some structural elements of Seaham North Dock.
- 168 Durham HER records, comprising:
 - 10 wreck records (8 correlating with UKHO and NMHR records);
 - 34 records for unknown obstructions (31 correlating with NMHR records);
 - 44 documented loss records (33 correlating with NMHR records);
 - 78 non-wreck or obstruction related offshore, intertidal and terrestrial assets ranging in date from the Mesolithic to the Modern periods (six that correspond with NMHR

records and excluding three records that correlate with HE designated assets and the Seaham Conservation Area). Nine of these records are located seaward of MLWS:

- Six flint findspot records of Mesolithic date;
- Three associated with elements of Seaham Dock and anchorage, including the lighthouse.

- 9.4.7.7 UKHO records and other non-designated assets comprising wrecks or possible wrecks are shown on **Figure 9.2** and terrestrial and intertidal non-designated assets are shown on **Figure 9.7**.
- 9.4.7.8 Within the MHPGC Project Peir Red Line Boundary, the assessment of hydrographic data identified:
- 215 low potential anomalies:
 - 159 in Scottish waters;
 - 56 in English waters;
 - 23 medium potential anomalies:
 - 12 in Scottish waters;
 - 11 in English waters;
 - 24 high potential anomalies:
 - Five in Scottish waters;
 - 19 in English waters.
- 9.4.7.9 The assessment also identified 1,170 magnetic anomalies of between 5.0nT and 1,056.0nT with no definitive correlation with known or visible features or infrastructure; 9595 in Scottish waters and 211 in English waters.
- 9.4.7.10 The distribution of high and medium potential anomalies, identified as likely wrecks or possible wrecks, are shown on **Figure 9.5** and that of magnetic anomalies is shown on **Figure 9.6**.
- 9.4.7.11 A broader potential for debris, wreckage and lost cargo is suggested by the documented loss records within the Marine and Intertidal Archaeology Study Area and the historically high volume of maritime traffic associated with trade and commercial fishing.
- 9.4.7.12 The following conclusions for the potential for archaeological remains to be present according to chronological archaeological period are presented within **Table 9.12**.

Table 9.12: Coastal and maritime archaeological potential within the Marine and Intertidal Archaeology Study Area

Period	Potential
Palaeolithic	Very low
Mesolithic	Low to locally Moderate
Neolithic	Low
Bronze Age	Very low
Iron Age	Very low
Roman	Very low
Early medieval	Very low
Medieval	Low
Post-medieval	Moderate to High
Modern	High

Aviation archaeology

- 9.4.7.13 There are no aircraft remains identified within Scottish or English waters within the Marine and Intertidal Archaeology Study Area.
- 9.4.7.14 Within English waters, there are ten NMHR records and two Durham HER records that pertain to documented losses of aircraft, and additional evidence for aviation activity from a nearby wartime aerodrome at Sunderland (RAF Usworth).

-
- 9.4.7.15 The potential for aviation remains to be within the Study Area is considered to be low to moderate, being greater within c. 12nm in English waters where the records are located and it being closer to documented aerodromes. Any remains would be automatically protected under the Protection of Military Remains Act 1986 and be of the highest significance.





Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
DISTRIBUTION OF UNITED KINGDOM HYDROGRAPHIC OFFICE (UKHO) RECORDS

0 10 20 km

Scale@A3:1:700,000

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Drawing Number:
FIGURE 9-2

Data Sources:
BP, Ordnance Survey

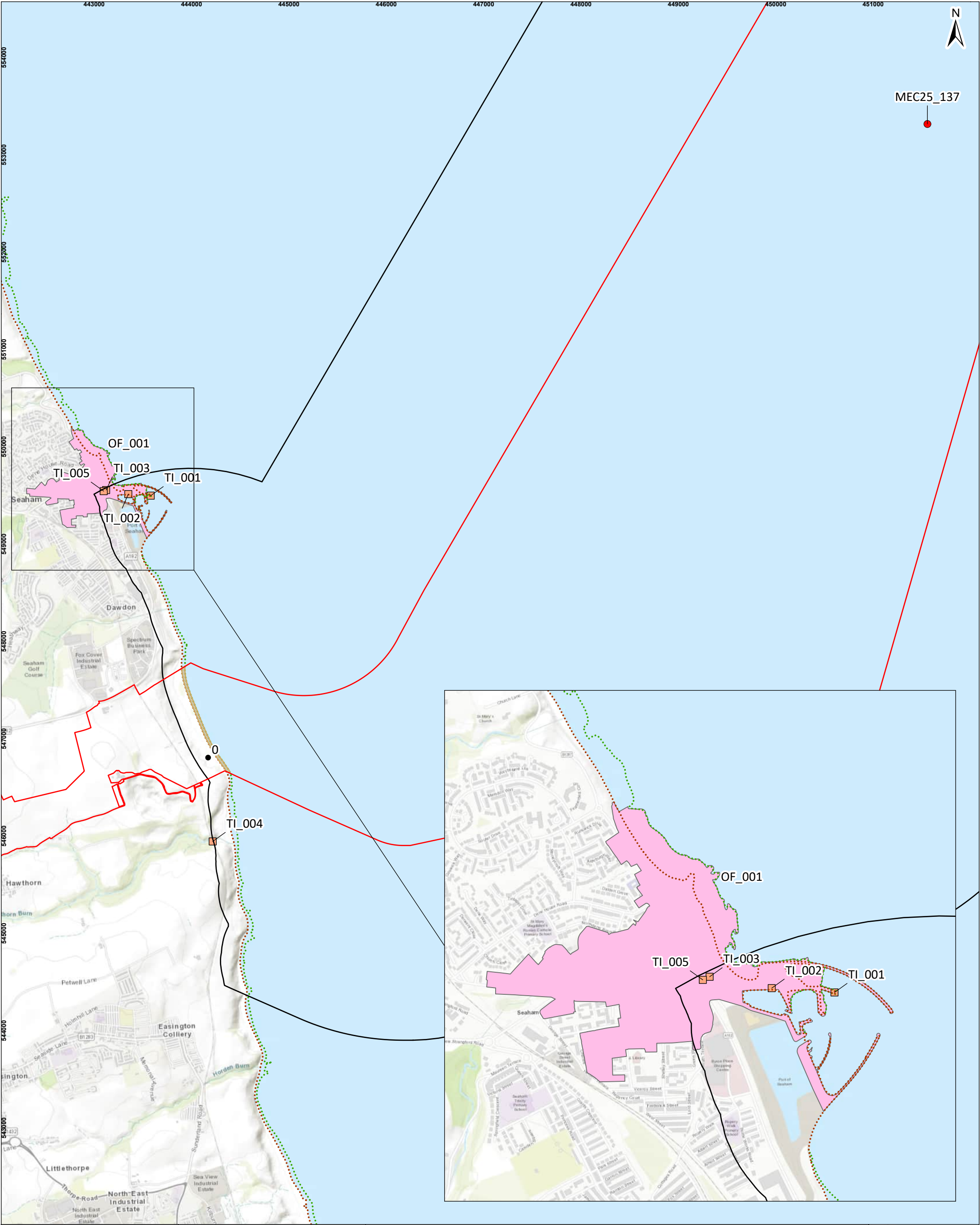
Service Layer Credits:
World Topographic Map: Esri, HERE, Garmin, FAO, USGS
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
Topographic: Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA
Topographic: Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA, NGA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP
-	-	-	-	-
-	-	-	-	-

LEGEND

- MHPGC Project PEIR
- Red Line Boundary
- Marine Archaeology Study Area
- Scottish-English offshore waters boundary
- Kilometer Points (KP)
- Intertidal Survey Area
- Mean Low Water
- Mean High Water
- UKHO 2026







Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
DESIGNATED HERITAGE ASSETS

Drawing Number:
FIGURE 9-3

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Topographic Map: Esri UK, Esri, HERE, Garmin, USGS, NSA
World Topographic Map: Esri UK, Esri, HERE, Garmin, FAO, USGS
World Topographic Map: Esri UK, Esri, HERE, Garmin, INCREMENT P, USGS, METUNASA
Topographic: Esri UK, Esri, HERE, Garmin, INCREMENT P, USGS, METUNASA, NSA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP
-	-	-	-	-
-	-	-	-	-

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

LEGEND

 MHPGC Project PEIR Red Line Boundary

 Marine Archaeology Study Area

 Scottish-English offshore waters boundary

 Kilometer Points (KP)

 Intertidal Survey Area

 Mean Low Water

 Mean High Water

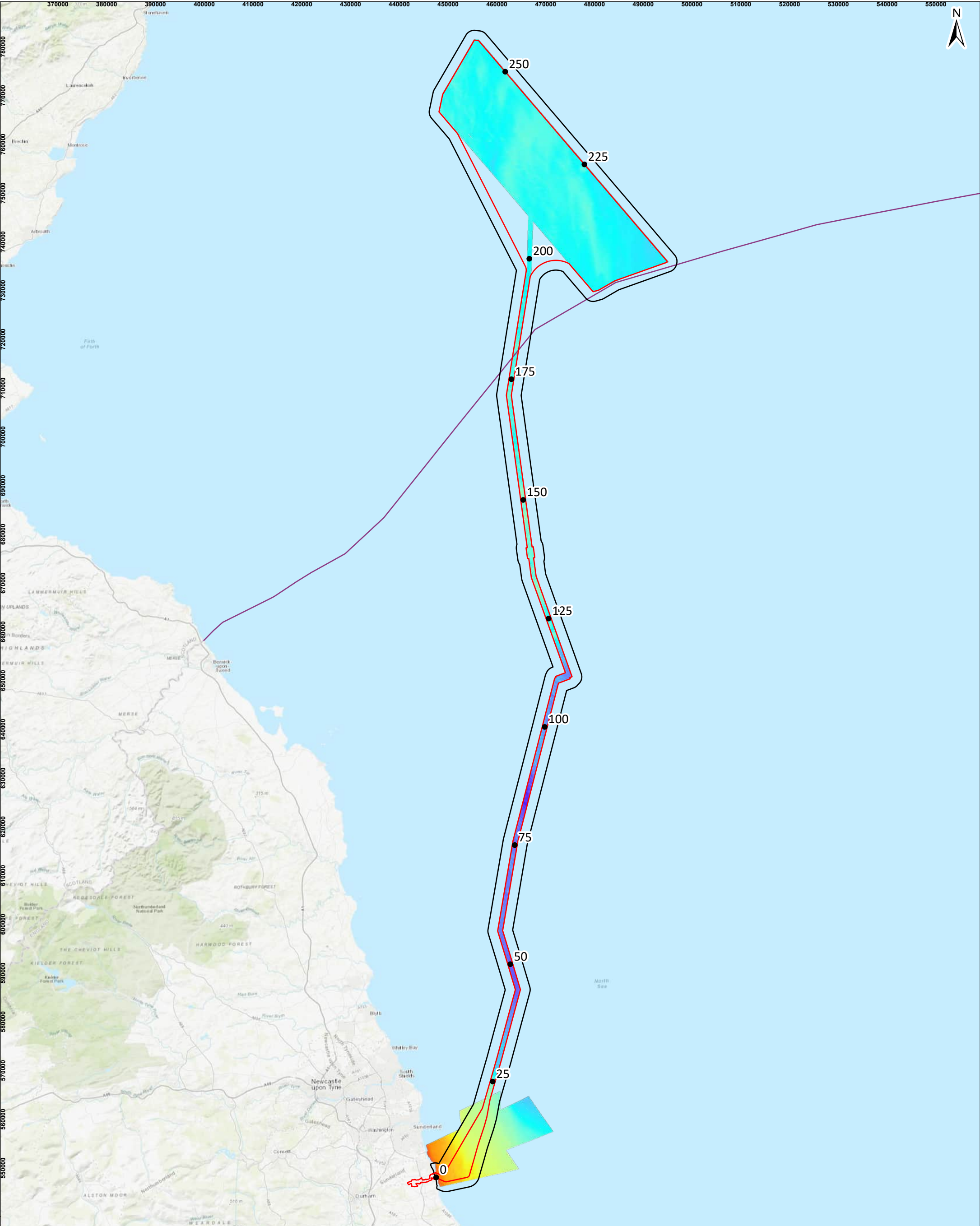
Designated Heritage Assets

 Conservation Areas

 Listed Buildings

 PMRA 1986







Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
MULTIBEAM BATHYMETRY COVERAGE

Drawing Number:
FIGURE 9-4

Data Sources:
BP, Ordnance Survey,

Service Layer Credits:
World Topographic Map: DeLorme, USGS, NOAA
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP
-	-	-	-	-
-	-	-	-	-

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

LEGEND

- MHPGC Project PEIR
- Red Line Boundary
- Marine Archaeology Study Area
- Scottish-English offshore waters boundary
- Kilometer Points (KP)
- Multibeam Bathymetry
- Depth (m) LAT
- 1.9
- 80.0







Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
DISTRIBUTION OF HIGH AND MEDIUM POTENTIAL ARCHAEOLOGICAL ANOMALIES

0 10 20 km

Scale@A3:1:700,000

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Drawing Number:
FIGURE 9-5

Data Sources:
BP, Ordnance Survey

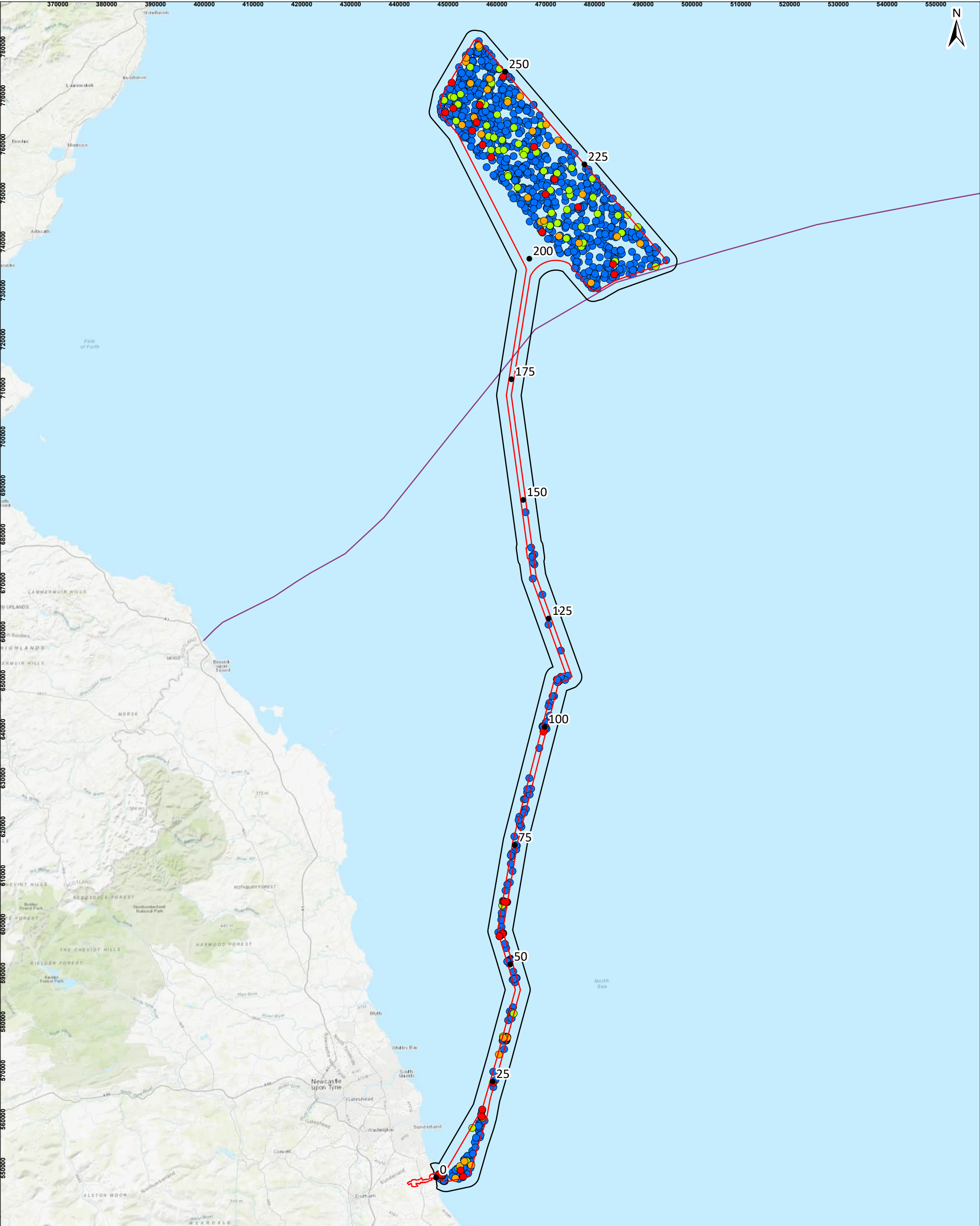
Service Layer Credits:
World Topographic Map: DeLorme, OS, Esri, HERE, Garmin, USGS, NOAA, NGA
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
Topographic: Esri, UK, Esri, HERE, Garmin, USGS, NOAA, NGA
Topographic: Esri, UK, Esri, HERE, Garmin, USGS, NOAA, NGA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP
-	-	-	-	-
-	-	-	-	-

LEGEND

- MHPGC Project PEIR
- Red Line Boundary
- Marine Archaeology Study Area
- Scottish-English offshore waters boundary
- Kilometer Points (KP)
- Archaeological Anomalies Potential
 - High
 - Medium







Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
DISTRIBUTION OF MAGNETIC ANOMALIES BY AMPLITUDE (NT)

Drawing Number:
FIGURE 9-6

Data Sources:
BP, Ordnance Survey,

Service Layer Credits:
World Topographic Map: DeLorme, USGS, NOAA
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

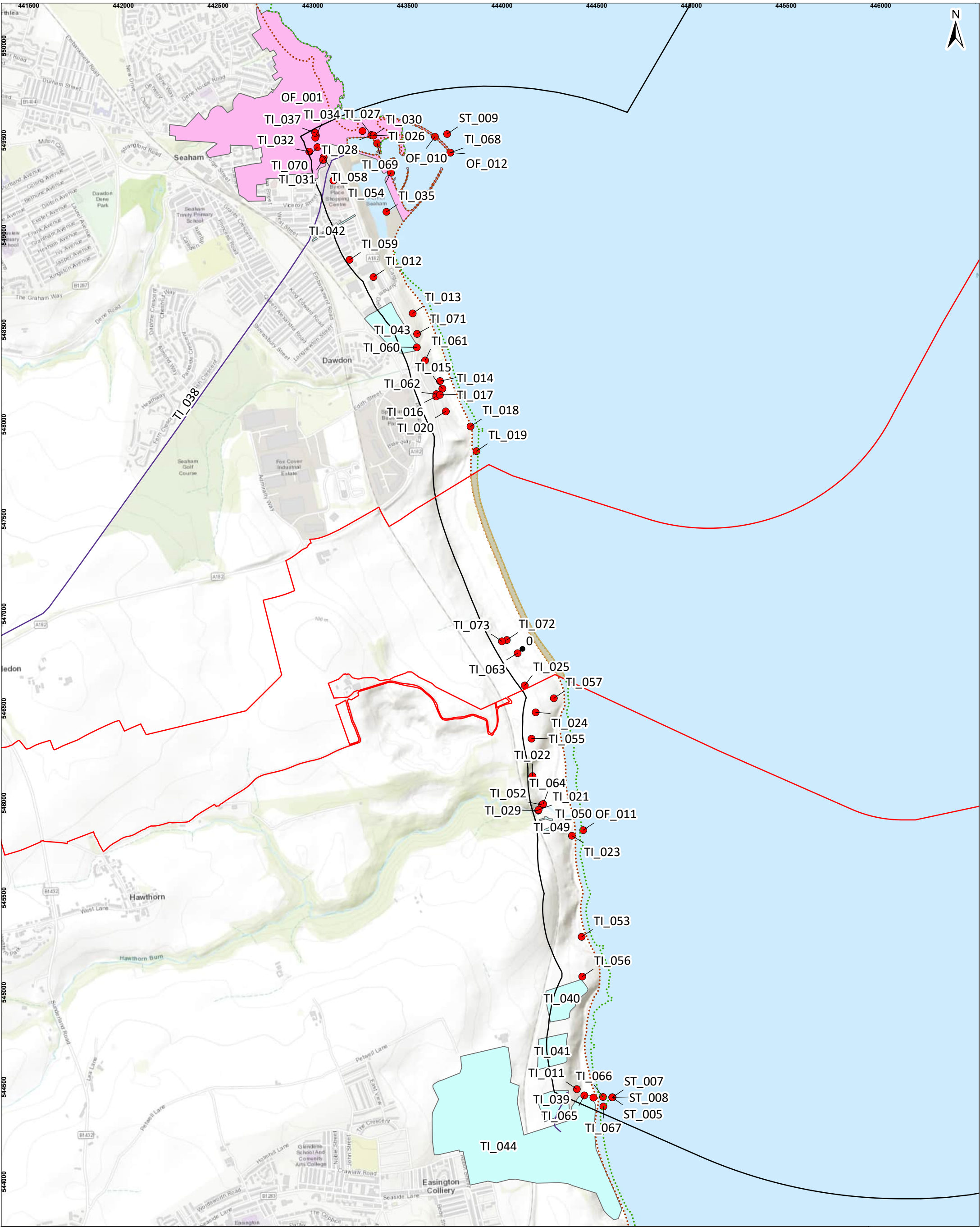
LEGEND

- MHPGC Project PEIR
- Red Line Boundary
- Marine Archaeology Study Area
- Scottish-English offshore waters boundary
- Kilometer Points (KP)

Magnetic anomalies
Amplitude range (nT)

- 5 to 50
- 50 to 100
- 100 to 200
- 200+







Project Name:
MORVEN HAWTHORN PIT GRID CONNECTION PROJECT

Drawing Title:
DISTRIBUTION OF HERITAGE ASSETS WITHIN THE INTERTIDAL ZONE

0

0.5 Kilometers

Scale@A3:1:18,000

Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Drawing Number:
FIGURE 9-7

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Topographic Map: Esri, UK, Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA, NGA
World Topographic Map: Esri, UK, Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA, NGA
Topographic: Esri, UK, Esri, HERE, Garmin, INCREMENT P, USGS, METNUSA, NGA

VER	DATE	DETAILS	BY	CHECK
00	15/09/2026	Initial Issue	MJ	FLP
01	15/09/2026	Final Issue	MJ	FLP
-	-	-	-	-
-	-	-	-	-

LEGEND

MHPGC Project PEIR

Red Line Boundary

Marine Archaeology Study Area

Scottish-English offshore waters boundary

Kilometer Points (KP)

Intertidal Survey Area

Mean Low Water

Mean High Water

Durham HER

Conservation Area

Heritage Feature Polygon

Heritage Feature Line

Heritage Feature Point



9.5 Impact assessment methodology

9.5.1 Overview

- 9.5.1.1 **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the preliminary marine and intertidal archaeology assessment. The methodologies for assessing sensitivity, magnitude and significance for marine and intertidal archaeology are described in more detail below.

9.5.2 Receptor sensitivity/value

- 9.5.2.1 The overall receptor sensitivity is determined by considering a combination of value, adaptability, tolerance and recoverability. This is achieved through applying known research and information on the status and sensitivity of the feature under consideration, coupled with professional judgement and experience.

Value

- 9.5.2.2 The UK Marine Policy Statement (DEFRA, 2020) indicates that authorities should take account of the particular nature of the interest in the (heritage) assets and the value they hold for this and future generations. Therefore, although valuation forms a necessary and important part of the process of determining sensitivity, it is not weighed directly against magnitude nor is it used in isolation to determine the significance of effect.
- 9.5.2.3 Both designated and non-designated heritage assets can hold heritage value. Value considers whether the receptor is rare, has protected status or has importance on a local, regional, national or international scale. Designated heritage assets, such as Protected Wreck Sites, hold high value.
- 9.5.2.4 High value and sensitivity are not necessarily linked within a particular impact. A receptor could be of high value but have a low or negligible sensitivity to an effect, for example, Lower Palaeolithic stone tools in a secondary context may be considered of high value but would not be highly sensitive to indirect impacts, such as scour. **Table 9.13** provides definitions for the value afforded to a receptor based on importance regarding legislation and guidance.

Table 9.13: Definitions of the value levels for historic assets

Value	Definition
High	Internationally or nationally important. Within a marine or intertidal context, high value heritage receptors include World Heritage Sites, Protected Wreck Sites, Scheduled Monuments, HMPAs (Scotland only), sites designated under the Protection of Military remains Act 1986 and heritage assets of acknowledged international importance or that can contribute significantly to acknowledged international research objectives. Additionally, in line with the UK Marine Policy Statement (DEFRA, 2020), any remains which are not currently designated but have equivalent significance to a designated asset are also considered to be of high value. High value Heritage Assets are those valued at national level, such as Scheduled Monuments and Grade I (England) / Grade A (Scotland) Listed Buildings. Such assets may lie within or extend into the intertidal zone.

Value	Definition
Medium	Within a marine or intertidal context, medium value receptors include heritage assets that are not designated and that do not meet the criteria for designation but display a combination of evidential, historical, aesthetic and/or communal value and heritage assets, groups of assets or landscapes that contribute to regional research objectives. Medium value Heritage Assets are those valued at a regional level, such as Grade II (England) / Grade B (Scotland) Listed Buildings, some Conservation Areas and areas of identified archaeological interest. Such assets may be situated within or extend into the intertidal or marine zone.
Low	Within a marine or intertidal context, low value receptors include heritage assets displaying limited combined or individual value and heritage assets, or groups of assets, that contribute to a limited degree to regional research objectives. Low value Heritage Assets are those valued at a local level, such as non-designated assets of local value. In Scotland only, Grade C Listed buildings are defined as those of local importance. Such assets may be situated within or extend into the intertidal or marine zone.
Negligible	Heritage assets with very little or no surviving archaeological interest and little or no combined or individual value and heritage assets, or groups of assets, that cannot appreciably contribute to acknowledged regional research objectives. Assets considered of negligible value would include badly preserved and/or damaged or very common archaeological features and buildings of little or no value at local or any other scale. Such assets may lie within or extend into the intertidal zone.
Uncertain	Historic assets for which the importance of the resource has not been ascertained and archaeological resources the importance of which cannot be ascertained.

Sensitivity

9.5.2.5 The sensitivity of a receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. As a finite resource, heritage assets typically have no ability to recover from direct impacts which result in a loss to their physical fabric. Recovery may be experienced, for example, when impacts arise from temporary changes to their setting. Sensitivity is defined by the following factors:

- Tolerance: the susceptibility (ability to be affected or unaffected) of a receptor to an external factor;
- Adaptability: the ability of the receptor to adapt to, or avoid, an external factor;
- Recoverability: the ability of a receptor to return to a state close to that which existed before the activity or event caused change within a specified period of time;
- Value: a measure of the receptor's heritage value.

9.5.2.6 To define the sensitivity of a receptor, the guidelines presented in **Table 9.14** have been adopted in this Marine and Intertidal Archaeology assessment. When defining sensitivity, reference has been made to the criteria levels set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**. To determine sensitivity of the receptor, the vulnerability of the receptor to the specific impact and its ability to recover and adapt were also considered.

Table 9.14: Definition of terms relating to the sensitivity of the receptor

Sensitivity	Definition
Very high / High ¹	Individual receptor has no or very limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Medium	Receptor has limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Low	Receptor has some tolerance to avoid, adapt to, accommodate or recover from the anticipated impact.
Negligible	Receptor is generally tolerant to and can accommodate or recover from the anticipated impact.

Value

- 9.5.2.7 The UK Marine Policy Statement (DEFRA, 2020) indicates that authorities should take account of the particular nature of the interest in the (heritage) assets and the value they hold for this and future generations. Therefore, although valuation forms a definitive part of the process, it is not weighed directly against magnitude nor is it used in isolation to determine the significance of effect.
- 9.5.2.8 Both designated and non-designated heritage assets can hold heritage value. Value considers whether the receptor is rare, has protected status or has importance on a local, regional, national or international scale. Designated heritage assets, such as Protected Wreck Sites, hold high value.
- 9.5.2.9 High value and sensitivity are not necessarily linked within a particular impact. A receptor could be of high value but have a low or negligible sensitivity to an effect, for example, Lower Palaeolithic stone tools in a secondary context may be considered of high value but would not be highly sensitive to indirect impacts, such as scour. **Table 9.15** provides definitions for the value afforded to a receptor based on importance regarding legislation and guidance.

Table 9.15: Definitions of the value levels for historic assets

Value	Definition
High	Internationally or nationally important. Within a marine or intertidal context, high value heritage receptors include World Heritage Sites, Protected Wreck Sites, Scheduled Monuments, HMPAs (Scotland only), sites designated under the Protection of Military remains Act 1986 and heritage assets of acknowledged international importance or that can contribute significantly to acknowledged international research objectives. Additionally, in line with the UK Marine Policy Statement (DEFRA, 2020), any remains which are not currently designated but have equivalent significance to a designated asset are also considered to be of high value. High value Heritage Assets are those valued at national level, such as Scheduled Monuments and Grade I (England) / Grade A (Scotland) Listed Buildings. Such assets may lie within or extend into the intertidal zone.

¹¹ 'Very High has been retained here as set out within **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**. However, in line with industry guidance (Historic Environment Scotland, 2018; English Heritage, 2008) 'high' has been correlated with 'very high' as it is the maximum level of sensitivity employed by Historic England and Historic Environment Scotland.

Value	Definition
Medium	Within a marine or intertidal context, medium value receptors include heritage assets that are not designated and that do not meet the criteria for designation but display a combination of evidential, historical, aesthetic and/or communal value and heritage assets, groups of assets or landscapes that contribute to regional research objectives. Medium value Heritage Assets are those valued at a regional level, such as Grade II (England) / Grade B (Scotland) Listed Buildings, some Conservation Areas and areas of identified archaeological interest. Such assets may be situated within or extend into the intertidal or marine zone.
Low	Within a marine or intertidal context, low value receptors include heritage assets displaying limited combined or individual value and heritage assets, or groups of assets, that contribute to a limited degree to regional research objectives. Low value Heritage Assets are those valued at a local level, such as non-designated assets of local value. In Scotland only, Grade C Listed buildings are defined as those of local importance. Such assets may be situated within or extend into the intertidal or marine zone.
Negligible	Heritage assets with very little or no surviving archaeological interest and little or no combined or individual value and heritage assets, or groups of assets, that cannot appreciably contribute to acknowledged regional research objectives. Assets considered of negligible value would include badly preserved and/or damaged or very common archaeological features and buildings of little or no value at local or any other scale. Such assets may lie within or extend into the intertidal zone.
Uncertain	Historic assets for which the importance of the resource has not been ascertained and archaeological resources the importance of which cannot be ascertained.

Non-designated assets in England

9.5.2.10 For non-designated assets, HE defines significance (value) as a combination of evidential, historical, aesthetic and communal values (English Heritage, 2008):

- Evidential value: the potential of a place to yield evidence about past human activity;
- Historical value: the ways in which past people, events and aspects of life can be connected through a place to the present – it tends to be illustrative or associative;
- Aesthetic value: the ways in which people draw sensory and intellectual stimulation from a place;
- Communal value: the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory.

Non-designated assets in Scotland

9.5.2.11 HES (2019a) follows the same basic principles, recommending the following valuation criteria to determine cultural significance:

- Intrinsic characteristics: how the physical remains of an asset contribute to our knowledge of the past;
- Contextual characteristics: how an asset relates to its surroundings and/or to our existing knowledge of the past;
- Associative characteristics: how an asset relates to people, practices, events and/or historic and social movements.

9.5.3 Magnitude of impact

9.5.3.1 The magnitude of an impact that could affect marine and intertidal archaeology receptors is influenced by several key factors, including the scale of the change, the spatial extent the impact is likely to occur and the duration and frequency of the impact. When defining the magnitude of the impact, criteria detailed in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** has been followed (see **Table 9.16**).

Table 9.16: Definition of terms relating to the magnitude of an impact

Magnitude	Definition
High	Beneficial effect Large scale improvement of resource or attribute quality; extensive restoration or enhancement (beneficial). Overwhelming positive changes around the asset that may contribute to the cultural significance of the asset, taking the form of; visual changes to key aspects of the historic landscape.
	Adverse effect Substantial loss or harm to the heritage asset/setting and/or integrity of the heritage asset or severe damage to key characteristics, features or elements (adverse), such that the heritage asset is lost or its significance is totally altered. Permanent/irreplaceable change, which is certain to occur, or a total or near complete loss of cultural significance.
Medium	Beneficial effect Improvement to, or addition of, key characteristics, features or elements of the resource; improvement to attribute quality (beneficial). Visual changes to key aspects of the historic landscape or improved access, resulting in an enhancement of the understanding or appreciation of the asset.
	Adverse effect Loss of, or alteration to, key characteristics, features or elements; measurable change in significance, attributes, quality or vulnerability (adverse), such that the heritage asset and its significance is altered. Appreciable change to setting resulting in a loss of understanding, appreciation or experience of the heritage asset. A notable depreciation of cultural significance.
Low	Beneficial effect Minor improvement to, or addition of, one or a small number of characteristics, features or elements; very minor improvement to attribute quality (beneficial).
	Adverse effect Minor loss of, or small alterations to, one or a small number of characteristics, features or elements; noticeable change in attributes, quality or vulnerability (adverse). Slight change to setting resulting in a minor loss of understanding, appreciation or experience of the heritage asset. A minor depreciation of cultural significance.
Negligible	Very minor or unquantifiable change to the receptor and its significance.
No change	No change to the receptor and its significance.

9.5.4 Significance of effect

- 9.5.4.1 The significance of the effect upon a marine and intertidal archaeology receptor is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The method employed for this assessment is presented in **Table 9.17**.
- 9.5.4.2 Following the classification of an effect using this methodology, a clear statement will then be made as to whether that effect is significant or not significant. Major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. Professional judgement is also applied to determine the significance of effects.

Table 9.17: Matrix used for the assessment of the significance of the effect

Sensitivity of receptor	Magnitude of impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
Medium	Negligible or minor	Minor	Moderate	Moderate or major
High	Minor	Minor or moderate	Moderate or major	Major
Very high	Minor	Moderate or major	Major	Major

9.5.5 Assumptions and limitations of the assessment

- 9.5.5.1 Assumptions and limitations associated with the establishing of the marine and intertidal archaeology baseline are outlined above, in **Paragraphs 9.4.4.9 to 9.4.4.12**. The archaeological data acquired from both site-specific survey and desk-based assessment was considered suitable for the archaeological assessment that has been used to inform the impacts assessment.
- 9.5.5.2 In relation to marine and intertidal archaeology, the following assumptions are made regarding the design parameters in order to ensure a realistic maximum design scenario (MDS) has been undertaken:
- The activity with the greatest likelihood for resulting in impacts is undertaken;
 - The activity with the greatest potential for significant impacts is undertaken;
 - Impacts of the greatest significance will be experienced.
- 9.5.5.3 The MDS may result in the maximum effect to any marine and intertidal archaeology receptor, i.e. the total loss of all heritage value inherent to the affected receptor. The MDS is presented by **Table 9.19**.

9.6 Key parameters for assessment

9.6.1 Scope of the assessment

- 9.6.1.1 The approach to assessment was presented in the MHPGC Project Scoping Report and has been refined and agreed to in consultation with relevant statutory and non-statutory consultees as detailed in **Section 9.3** and through the MHPGC Project Scoping Opinions received from the PINS and MD-LOT.
- 9.6.1.2 **Table 9.18** summarises the impacts considered as part of the assessment. No effects have been scoped out of the assessment.

Table 9.18: Impacts scoped into the assessment

Impact	Potential effects scoped into the assessment
Construction phase	
Direct and indirect impacts to known archaeological sites and geophysical anomalies of high or medium potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to geophysical anomalies of low archaeological potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets

Impact	Potential effects scoped into the assessment
Direct and indirect impacts to magnetic anomalies	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to unknown archaeological sites and remains	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to sub-seabed deposits of geoarchaeological potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
O&M phase	
Direct and indirect impacts to known archaeological sites and geophysical anomalies of high or medium potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to geophysical anomalies of low archaeological potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to magnetic anomalies	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to unknown archaeological sites and remains	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to sub-seabed deposits of geoarchaeological potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Decommissioning phase	
Direct and indirect impacts to known archaeological sites and geophysical anomalies of high or medium potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to geophysical anomalies of low archaeological potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to magnetic anomalies	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to unknown archaeological sites and remains	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets
Direct and indirect impacts to sub-seabed deposits of geoarchaeological potential	Damage to/loss of historic material/remains and diminishment of heritage value of affected assets

Spatial Scope

- 9.6.1.3 The spatial scope of the preliminary assessment of impacts to marine and intertidal archaeology receptors initially comprised the MHPGC Project PEIR Red Line Boundary and a provisional 9km buffer measured from its boundaries up to MHWS (the Zol for marine and intertidal archaeology). This Zol was informed by the maximum distance for measurable suspended sediment concentration (SSC) increase as a result of activities undertaken within the MHPGC Project PEIR Red Line Boundary, presented and assessed in **Volume 2, Chapter 1: Physical Processes, of the PEIR**. The provisional Zol was subsequently refined to a 500m buffer, based on the results of detailed assessment of SSC transportation, which determined that, beyond 500m, changes to SSC will be negligible. This approach was discussed with HE during the EWG2 meeting, to which no objection was raised (see above, **Section 9.3.2**, Table 9.6: Summary of further consultation and engagement **Table 9.6**).

- 9.6.1.4 The Zol, comprising a 500m buffer, is therefore the spatial basis for the assessment of potential indirect impacts to marine and intertidal archaeology receptors, as detailed below within **Section 9.8, Paragraphs 9.8.2.16 to 9.8.2.19**, and includes the spatial scope for all potential direct impacts (i.e. within the MHPGC PEIR Red Line Boundary).
- 9.6.1.5 As set out above, **Section 9.4.2**, the Zol is not to be confused with the Marine and Intertidal Archaeology Study Area (agreed in consultation with HE as detailed within **Section 9.3.2, Table 9.6**) that has been used only to inform the marine and intertidal archaeology baseline assessment. As detailed within **Paragraph 9.4.2.4**, the Marine and Intertidal Study Area and Zol are two distinct entities defined and used for these specific assessments and are not interchangeable.

Temporal Scope

- 9.6.1.6 The temporal scope of the assessment of marine and intertidal archaeology is consistent with the period over which the MHPGC Project would be constructed and operated. Subject to gaining development consent, it is anticipated that the construction phase duration would be up to four years. Following the construction phase, the MHPGC Project would enter its O&M phase. It is assumed that maintenance and repair activities could take place at any time during the life span of the MHPGC Project.
- 9.6.1.7 Direct impacts to marine and intertidal archaeology receptors are most likely to occur during the construction phase of the MHPGC Project (including site preparation activities). Indirect impacts may also occur because of construction-related activities.
- 9.6.1.8 The MHPGC Project is expected to have a life span of 35 years (i.e. the duration of the O&M phase). If decommissioning is required at this point (in c. 2073), activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, and with the removal of visible infrastructure, effects would reduce over the course of the decommissioning period.
- 9.6.1.9 The temporal scope of individual activities has informed the assessment for both direct and indirect impacts, as relevant (**Section 9.8**).

9.6.2 Maximum design scenario

- 9.6.2.1 The maximum design scenario (MDS) for each impact identified in **Section 9.6.1** has been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The MDS presented in **Table 9.19** have been selected from the parameters provided in **Volume 1, Chapter 2: Project Description, of the PEIR** and methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 9.19: MDS relevant for the assessment of potential impacts on Marine and Intertidal Archaeology

Impact	Maximum Design Scenario	Explanation
Note: The cable length measurements are for the distance between the OSP and trenchless drill exit pit unless otherwise stated. For clarity one trench length is as follows: - OSP to exit pit – up to 324.67 km; - OSP to MHWS – up to 326.00 km - Scottish waters (OSP – Scottish-English Offshore Waters Boundary) – up to 98 km; - English waters (English offshore waters boundary – exit pit) – up to 226.67 km; and - English waters (English offshore waters boundary – MHWS) – up to 228.00km		
Construction		
Direct impacts to marine archaeology receptors resulting in damage or loss.	Construction duration: up to four years. Sandwave clearance: Sandwave clearance activities may be undertaken using a range of techniques (plough and MFE), over an approximate four-month duration in both Scottish and English waters. - Sandwave clearance activities undertaken using MFE over an approximate four-month duration; - Sediment disturbance rate is 1000kg/s - Surface width of up to 28 m per trench and base width of up to 20 m per trench; <u>Per trench = 1,484,000 m²</u> - Scottish waters: 31 km length × 28 m width = 868,000 m² - English waters: 22 km length × 28 m width = 616,000 m² <u>Total (up to two trenches) = 2,968,000 m²</u> - Scottish waters: 1,736,000 m² - English waters: 1,232,000 m² Cable installation (trenching): Trenching may be carried out by mechanical cutting, jet trenching, ploughing or CFE.	The MDS is defined by the maximum spatial extent of seabed disturbance from cable installation, route preparation, sandwave clearance and landfall works. Landfall works and vessel interactions are defined by the maximum footprint of exit pits, floatation pits, anchor spreads and jack-up activities. The MDS is inherently precautionary, assuming all maximum parameters occur concurrently with no reduction for overlapping disturbance footprints. Any disturbance of the seabed from construction activities could directly impact marine archaeology receptors. These effects are likely to be localised, but should they occur, they could lead to adverse and irreversible damage to known or previously undiscovered heritage assets. The MDS represents the maximum footprint for potential direct impacts to marine archaeology receptors.

Impact	Maximum Design Scenario	Explanation
	• Installation via trenching of up to 324.67 km of cable, with a trench width of up to 2.1m, a depth of up to 3m. • Trenching rate is 400m/hr. <u>Per trench = 2,045,421 m³</u> • Scottish waters: 98 km length × 2.1 m width × 3m depth = 617,400 m³m² • English waters: 226.67 km length × 2.1 m width × 3 m depth = 1,428,021 m² <u>Total (up to two trenches) = 4,090,842 m³</u> • Scottish waters: 1,234,800 m³ • English waters: 2,856,042 m³ Trenchless techniques (landfall)(English waters): Trenchless installation methods include HDD and Direct Pipe: • Up to four boreholes. Trenchless installation via Horizontal Directional Drilling (HDD), (conduit diameter of 1.6 m, conduit length of 2,000 m). Drilling fluid discharge up to 180 m³ each and up to 1,083 m³ total. • Trenchless drill punchout will be up to approximately 1660 m offshore of MHWS in water depths up to 20 m LAT. • Up to four exit pits (140 m long × 50 m wide × 5 m deep). Area up to 7,000 m² each; 28,000 m² total. Volume up to 18,667 m³ each; 74,668 m³ total. • Up to two floatation pits (240 m long × 55 m wide × 5 m deep). Area up to 13,200 m² each; 26,400 m² total. Volume up to 39,167 m³ each; 78,334 m³ total. Vessel interactions (landfall only) (English waters): • Up to 127,456 m² anchor seabed disturbance per vessel movement × 40 full anchor spread movements = 5,098,230 m² • Up to six jack-up events (2 m diameter spud legs × 4), 3.14m² per events, total disturbance = 18.85 m².	

Impact	Maximum Design Scenario	Explanation
	Cable protection: • Total of up to 10.7% (equivalent to 35km) within Scottish and English waters may require external protection (8.3%, or 27km, of rock installation, concrete mattresses or rock bags, and 2.4%, or 8km, of Cable Protection Systems (CPS)); • Rock installation may be up to 14m wide and 2m high. Concrete mattresses or rock bags may be up to 27,070m long and 6m wide. Concrete mattresses may be up to 0.35m high, and rock bags up to 1m high. Cable protection systems may be up to 0.8m wide and 0.8m high; • Total area of up to 770,760m² (up to 757,960m² for rock installation, concrete mattresses or rock bags and up to 12,800m² for CPS). Offshore Export cable crossings: • Up to 16 crossings, for up to two trenches, using either rock installation or concrete mattresses (or a combination of both) within Scottish and English waters; • Each crossing will be up to 200m (length) x 18m (wide) x 2m (height) resulting in a long-term habitat loss of up to 3,600m² per crossing; • Total area of up to 57,600m².	
Indirect impacts to marine archaeology receptors resulting from sediment disturbance and deposition.	Construction duration: up to four years. Site preparation: • Sandwave clearance activities may be undertaken using a range of techniques (plough and MFE), over an approximate four-month duration in both Scottish and English waters. Releases via both are modelled; • A conservative MFE near-bed sediment release rate of 1000kg/s conservatively estimated based on the MDS trench cross section dimensions, the speed of progress of the tool and the bulk density of the local sediment type; • Dredge spoil release is simulated as an instantaneous release at the water surface. 10% of 11,000m³ is assumed to form the passive phase of the plume;	The MDS is defined by the maximum spatial extent of seabed disturbance from cable installation, route preparation, sandwave clearance and landfall works. Landfall works and vessel interactions are defined by the maximum footprint of exit pits, floatation pits, anchor spreads and jack-up activities. The MDS is inherently precautionary, assuming all maximum parameters occur concurrently with no reduction for overlapping disturbance footprints.

Impact	Maximum Design Scenario	Explanation
	- Other seabed preparation such as sandwave clearance plough, boulder clearance and PLGR may be used but do not represent the MDS in terms of potential increases in SSC and associated deposition. Cable installation: - Trenching may be carried out by mechanical cutting, jet trenching, ploughing or CFE. Jet trenching is anticipated to generate the highest suspended sediment concentrations (SSC) and has therefore been assumed as the MDS; - Suspension of 100% of material from the trench cross section will give the MDS for sediment disturbance; - Conservatively assumes 100% fluidisation of material expelled from a U-shaped trench. In reality, trenching will move a proportion of material rather than bringing it fully into suspension; - Offshore export cable corridor trenching modelling assumes sediment release along the whole offshore export cable corridor; - Cable routes cross a variety of seabed materials, and burial depth may be up to 3 m in some areas. The assessment therefore considers this upper bound to define the MDS in terms of sediment disturbance; - Trenching rate will be up to 400 m/hr. Trenchless techniques (landfall): - Trenchless installation methods include HDD and Direct Pipe; - HDD represents the maximum MDS for sediment disturbance due to the potential for drilling fluid release (frac-out); - The MDS for sediment disturbance by trenchless installation is given by applying a conservative Bentonite concentration of 100kg/m³ in drilling mud, the volume of	Indirect impacts may result from any activities interacting with the seabed as they have the potential to mobilise sediments which may subsequently travel before redepositing. Redeposited sediments, if in sufficient volume, may compact and damage marine archaeology receptors. The MDS represents the maximum volumes or increases to suspended sediment with the potential to result in indirect impacts to marine archaeology receptors.

Impact	Maximum Design Scenario	Explanation
	spoil released is equal to the maximum volume of the bore; - Other stages of drilling (pilot hole drilling and stages of reaming) may result in smaller release events separated in time. But the MDS is considered as a release of drilling mud from a single conduit; - Two drills could be operational at one time; however, the timing of drilling will be staggered meaning there will not be an occasion where punch-out occurs simultaneously (or within 6 hours of each other). - Trenchless drill punchout will be up to approximately 1,660m offshore of MHWS in water depths up to -20m LAT. - Up to four boreholes. Trenchless installation via Horizontal Directional Drilling (HDD), (conduit diameter of 1.6 m, conduit length of 2,000 m). Drilling fluid discharge up to 180 m³ each and up to 1,083 m³ total.	
Operation and Maintenance		
Direct impacts to marine archaeology receptors resulting in damage or loss.	O&M: Operational lifespan of 35 years. Vessel presence: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trip – 4x3 = 12 - Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (USV) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey.	The MDS for direct impacts to the seabed associated with export cable maintenance includes the maximum number of repair and remediation events along with associated vessels. Cumulatively, this represents the maximum footprint for potential direct impacts to marine archaeology receptors. Localised repair/replacement works to cables or remedial external cable protection may be required. Although assets may have been identified prior to or during pre-construction and construction, further assets may remain undetected. Where operational and maintenance activities extend beyond the footprint of previous works, undetected assets may experience the same direct impacts as during the construction phase.

Impact	Maximum Design Scenario	Explanation
	Per year for 2 trenches: • Surveys – 4 • Return trips – $4 \times 55 = 220$ • Total vessels at time – 5 • Remediation (up to 13.056km per year per trench, in different locations along route) Vessels on site for REMEDIATION activities, for up to two trenches: • Up to four operation and maintenance vessels on site at any one time, comprising a combination of construction support vessel (CSV) and/or Service Operation Vessels (SOV) and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: • Up to 62 operation and maintenance vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. • Repair (41 lifetime repairs, for up to two trenches) Vessels on site for REPAIR activities, for up to two trenches: • Up to four operation and maintenance vessels on site at any one time, comprising a combination of CLV and/or barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump. Vessel movements (repair), for up to two trenches: Up to 245 operation and maintenance vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or Jack-Up and/or Barge Handlers/Tugs and/or CSV and/or CTV and/or Rockdump. Cable repairs (English and Scottish waters): • Up to 41 export cable repairs, each with a length of up to 2km and a 20m width. Up to 40,000m² of temporary disturbance each; 1,640,000m² total;	

Impact	Maximum Design Scenario	Explanation
	Up to 4% of the cable route length, up to 13km, may require remediation per year. Remediation may occur in different locations and for varying lengths but is anticipated that up to 13km of export cable length per year per trench will require remediation with a maximum width of 20m. Up to 522,240m² of temporary disturbance per year; total 18,278,400m².	
Indirect impacts to marine archaeology receptors resulting from sediment disturbance and deposition.	Operational life of 35 years; Cable repairs (English and Scottish waters): - Up to 41 export cable repairs, each with a length of up to 2km and a 20m width. Up to 40,000m² of temporary disturbance each; 1,640,000m² total; - Up to 4% of the cable route length, up to 13km, may require remediation per year. Remediation may occur in different locations and for varying lengths but is anticipated that up to 13km of export	Cable repairs (English and Scottish waters): - The greatest foreseeable number of cable reburial and repair events is considered to be the MDS for sediment dispersion; - The majority of cable repairs are anticipated to be c.500-1000m. The MDS utilises the area of disturbance by repair which provides a highly conservative area; - The repair of cables may be undertaken using similar techniques to those employed during installation, therefore the potential increases in SSC and deposition would be in-line with the construction phase. Indirect impacts resulting from sediment disturbance and redeposition may compact or undermine marine and intertidal archaeology assets, as during the construction phase. The MDS represents the maximum volumes or increases to suspended sediment with the potential to result in indirect impacts to marine archaeology receptors.
Decommissioning		
Direct and indirect impacts to known or previously unrecorded marine archaeology receptors resulting in damage and/or loss.	All export cables and cable protection will be removed.	Decommissioning is likely to operate within the parameters identified for construction. This represents the maximum footprint for potential direct and indirect impacts to marine archaeology receptors. Whilst the MDS is for all materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The decommissioning approach will be reviewed at the time of decommissioning following the most up to date and best available guidance.

Impact	Maximum Design Scenario	Explanation
		Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience both direct and indirect impacts as detailed above.

9.7 Commitments adopted as part of the MHPGC Project

- 9.7.1.1 As set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** and **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**, several measures have been adopted as part of the MHPGC Project to reduce the potential for impacts on marine and intertidal archaeology.
- 9.7.1.2 Embedded mitigation includes the following measures as identified in the Institute of Sustainability and Environmental Professionals (ISEP), formerly Institute of Environmental Management and Assessment (IEMA) Guide to Shaping Quality Development (IEMA, 2015):
- Primary mitigation - measures included as part of the project design. ISEP (formerly IEMA) describes these as “modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken”. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and marine licence, or both;
 - Tertiary mitigation - ISEP describes these as “actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects”.
- 9.7.1.3 Embedded mitigation measures that will form part of the final design (and are established legislative requirements/good practice, or both) have been taken into account as part of the initial assessment presented in **Section 9.8** (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures that the MHPGC Project is committed to are considered in the assessment of effects.
- 9.7.1.4 Where an assessment identifies likely significant adverse effects, secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by ISEP as “actions that will require further activity to achieve the anticipated outcome” and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures both pre-mitigation and residual effects are presented.
- 9.7.1.5 The measures relevant to marine and intertidal archaeology are outlined in **Table 9.20**. As there is a secured commitment to implementing these measures, they are considered inherently part of the design of the MHPGC Project and have therefore been considered in the assessment presented in **Section 9.8**.

Table 9.20: Embedded commitments relevant to marine and intertidal archaeology implemented as part of the MHPGC Project

Commitment number	Measure adopted	How the measure will be secured
CoT63	The Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)

Commitment number	Measure adopted	How the measure will be secured
CoT64	The Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will be prepared and submitted as part of the application for Development Consent and Marine Licence application(s) to the Scottish Ministers. The Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will include: • Archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator; • Details of proposed Archaeological Exclusion Zones (AEZs) and Temporary Archaeological Exclusion Zones (TAEZs) and the methodology for their implementation; • The process for the reporting of unexpected discoveries of potential archaeological interest and the subsequent steps to be taken (the PAD); • Rationale for archaeological input into specifications and archaeological analysis of further pre-construction surveys such as geophysical, geotechnical, UXO or ROV/diver surveys; • Rationale for the consultation of archaeologists in advance of site preparation activities or other pre-construction operations and, if appropriate, high-level methodologies for archaeological monitoring of such work; • Rationale for operational awareness of the location of geophysical/magnetic anomalies identified as having a low archaeological potential and any necessary reporting requirements should material of potential archaeological interest be encountered; • Rationale for obtaining geotechnical cores for archaeological review and implementation of a staged process of geoarchaeological works, as necessary; • Options for the mitigation of unavoidable direct impacts on known sites of archaeological significance (to be presented in greater detail within bespoke and activity-specific Method Statements, to be prepared and agreed with the Archaeological Curator and the Developer, as necessary). The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities, in consultation with Historic England.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)

9.8 Assessment of impacts

9.8.1 Overview

- 9.8.1.1 This section includes the assessment of the impacts to marine and intertidal archaeology arising from the construction, O&M and decommissioning phases of the MHPGC Project. A summary of the effects is presented in **Table 9.44**.
- 9.8.1.2 The impact assessment scenario assumes the MDS taking place (**Table 9.19**) alongside the embedded mitigation (**Table 9.20**).
- 9.8.1.3 The impact assessments presented in this section are applicable to English and Scottish waters (see Paragraphs 9.6.1.3 and 9.6.1.4 for the definition of the spatial scope).

9.8.2 Construction phase

Direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

Receptor sensitivity

- 9.8.2.1 The baseline assessment has identified 206 records representing wrecks or possible wrecks (unidentified obstructions) and 47 archaeological anomalies of high or medium potential, 23 of which have been actually or potentially correlated with UKHO records. One UKHO record represents the remains of the RFA *Creosol*, which is designated under the Protection of Military Remains Act 1986. The remaining high and medium potential anomalies may represent additional wrecks and wreck-related material (such as debris) and may therefore possess the same value as known wrecks.
- 9.8.2.2 The value of a receptor has been used to inform the determination of its sensitivity, as outline above, **Section 9.5.2**. For non-designated assets, this takes into account evidential, historical, aesthetic and communal value as per HE guidelines (English Heritage, 2008); and intrinsic, contextual and associative characteristics as per HES guidelines (2019a). Wrecks may be considered of the highest value in terms of cultural significance.
- 9.8.2.3 The MDS would see direct or indirect impacts (or both) from construction phase activities result in the permanent and irreversible damage or loss (or both) of this receptor or parts thereof, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context (equivalent to a maximum high magnitude of impact). Value may also be diminished should activities result in the transportation of archaeological remains from their primary context. Indirect impacts may cause similar damage/loss, resulting in similar change to value. This receptor has no capacity to accommodate or recover from such impacts.
- 9.8.2.4 Therefore, the sensitivity of known archaeological sites and geophysical anomalies of high or medium archaeological potential is considered to be **high**.

Magnitude of impact

- 9.8.2.5 Construction activities, including seabed preparation, have the potential to result in direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Such activities may comprise:
- Sandwave clearance;
 - Cable installation (trenching);
 - Trenchless techniques (at landfall);
 - Vessel interactions;
 - Cable protection;
 - UXO low order clearance;
 - Cable crossings.
- 9.8.2.6 The pathways for impacts during site preparation comprise use of ploughs, PLGR, MFE, and vessel anchoring. Pathways for impacts from construction activities would include trenching/excavation for cable laying, cable laying directly on the seabed and cable installation at

landfall, along with vessel anchoring/jack-up. Landfall impacts would be applicable to the nearshore zones only, whilst site preparation, cable laying-related and vessel anchoring/jack-up impacts may occur throughout the MHPGC Project PEIR Red Line Boundary. These activities have the potential to damage and disperse archaeological remains.

- 9.8.2.7 Direct impacts from construction phase activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Such activities may also result in dispersal of remains that contribute to the total value of this receptor, leading to a reduction in that value.
- 9.8.2.8 The establishment and adherence to AEZs or TAEZs throughout the construction phase would remove the potential for direct impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential (CoT64). A bespoke and appropriately sized buffer will be implemented for each known asset, within which no construction activities will take place. If this is unachievable, other measures will be implemented to ensure the appropriate mitigation of potential direct impacts to this receptor, through discussion with relevant stakeholders (CoT64).
- 9.8.2.9 The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'
- 9.8.2.10 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.11 Therefore, it is considered that the magnitude of direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters during the construction phase is considered to be **negligible**.

Significance of effect

- 9.8.2.12 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts on known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.13 No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

Receptor sensitivity

- 9.8.2.14 The sensitivity of known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters has been assessed as **high** (see **Paragraphs 9.8.2.1 and 9.8.2.2**).

Magnitude of impact

- 9.8.2.15 Indirect impacts also have the potential to affect this receptor, such as sediment transportation and redeposition resulting from construction activity impact pathways (**Paragraphs 9.8.2.5 and 9.8.2.6**).

- 9.8.2.16 The results of detailed marine physical processes assessments were consulted to determine the potential for indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential through other pathways. **Volume 2, Chapter 1: Physical Processes, of the PEIR** concluded that construction activities would generate a very high, near-field (5 to 10m) SSC along the tidal axis (broadly parallel to the coastline). The tidal axis and extent of a single spring tidal excursion has been used as the MDS. The maximum tidal excursion buffer varies throughout the MHPGC Project PEIR Red Line Boundary (see **Volume 2, Chapter 1: Physical Processes, of the PEIR** for further detail):
- Offshore Scottish waters: <6km;
 - Offshore English waters: <6km;
 - Nearshore English waters: <9km.
- 9.8.2.17 An increase in SSC would last for the duration of the disturbance and up to 30 minutes thereafter. A large proportion of this sediment would settle on the seabed within 10m of the activity, with the actual amount depending on the grain size and flow conditions.
- 9.8.2.18 Whilst pre-lay cable trenching may be carried out by mechanical cutting, jet trenching, ploughing or CFE, jet trenching has been assumed as the MDS as it will generate the highest SSC concentrations (see above, **Table 9.19**). The following additional assumptions were made:
- Sediment releases would create a long, relatively thin plume extending along the tidal axis to the tidal excursion buffer from the point of disturbance.
 - Spring tide conditions would carry sediment at a faster rate and disperse over a larger area and water volume, resulting in a lesser SSC in the sediment plume than a comparable neap tide.
 - Slack water conditions would see denser sediment plumes and increased SSC within. Advection and dispersal would be slower to return the SSC to background levels.
 - The limited footprint of the plume means that specific locations will only be affected by the increase in SSC for the limited duration for the plume to be advected.
 - The path followed by the tidal ellipse is not the same on every tide, therefore, it is unlikely that the same area of seabed will be affected by higher SSC within the localised plume for more than one or two consecutive tides.
 - Four zones of effect were identified:
 - 0m to 50m from activity: zone of highest SSC increase and greatest likely thickness of redeposition. Will primarily comprise coarser sand and gravel depositing in thickness of tens of centimetres to several metres, with greater deposition closer to the site of disturbance (e.g. 1.26m thickness of redeposited sediment at 5m distance; 0.63m at 10m; 0.126m at 50m).
 - 50m to 500m from activity: zone of measurable SSC increase and measurable, but lesser, thickness of redeposition. Will primarily comprise sands released or resuspended higher in the water column and resettling whilst being advected by ambient tidal currents. Thickness of redeposited sediment will be greater closer to the site of disturbance, within the tidal excursion buffer (e.g. 63mm at 100m; 25mm at 250m; 13mm at 500m).
 - 500m to the edge of the tidal excursion buffer: zone of lesser, but measurable, SSC increase and no measurable thickness of redeposition. Will primarily comprise fine sediments maintained in suspension for more than one tidal cycle and are advected by ambient tidal currents. Increased SSC will be rapidly dispersed to ambient values within 24 hours of cessation of disturbance. Thickness of redeposited fine sediment is unlikely to be measurable.
 - Beyond the tidal excursion buffer: zone where increased SSC will be very low and not measurable. Redeposition of sediment will be extremely limited and not measurable.
- 9.8.2.19 The potential for interaction of sediment plumes from different activities occurring simultaneously is low. Seabed preparation activities are expected to occur prior to cable installation activities and seabed preparation activities are unlikely to occur simultaneously with other seabed preparation activities nor construction activities with other construction activities.
- 9.8.2.20 The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the activity but could result in the permanent and irreversible damage or loss of

this receptor or parts thereof, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Such activities may also result in dispersal of remains that contribute to the total value of this receptor, leading to a reduction in that value. The magnitude of impact will be reduced by embedded mitigation measures, including the implementation of AEZs and archaeological analysis of pre-construction surveys (CoT64).

- 9.8.2.21 There is some potential for the redeposition of SSC to have beneficial effects, in that some covering of assets might provide a cushion or extra level of protection if at a level not likely to cause damage or harm via compression. However, the extent of this beneficial impact can only be determined on a case-by-case basis, as it would be subject additional factors such as distance between the activity and receptor, quantity and density of the redeposited sediment, the characteristics of the receptor (i.e. individual strength, stability and level of preservation). The quantification of the potential beneficial effects is unknown at this stage.
- 9.8.2.22 The establishment and adherence to AEZs or TAEZs throughout the construction phase would reduce the potential for adverse indirect impacts to known archaeological sites and geophysical anomalies of high and medium archaeological to levels unlikely to result in damage/loss (CoT64). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.23 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.24 Therefore, it is considered that the magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters during the construction phase is considered to be **negligible**.

Significance of effect

- 9.8.2.25 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of indirect impacts is **negligible**. Therefore, the effect of indirect impacts on known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.26 No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to geophysical anomalies of low archaeological potential

Receptor sensitivity

- 9.8.2.27 Geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin but unlikely to be of high archaeological significance, such as discarded fishing gear, discarded cargo or elements of wreck. The cultural significance of this receptor would be principally determined by its evidential and/or historical value. Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value.
- 9.8.2.28 Likely comprising material of limited to no archaeological significance, this receptor has limited capacity to accommodate or recover from direct impacts.
- 9.8.2.29 Therefore, the receptor sensitivity is considered to be **medium**.

- 9.8.2.30 However, should further investigations or surveys provide additional information that might result in a re-classification of a geophysical anomaly of low potential (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied. Provision for this will be detailed within the Outline Offshore WSI and PAD, to be submitted at ES (CoT63).

Magnitude of impact

- 9.8.2.31 Construction activities also have the potential to directly impact geophysical anomalies of low archaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (**Paragraphs 9.8.2.5 and 9.8.2.6**).
- 9.8.2.32 Direct impacts from construction activities could result in permanent and irreversible damage or loss of this receptor or parts thereof, thus diminishing their evidential and historical value, which is derived in part from the cohesion of archaeological material (equivalent to a maximum high magnitude of impact).
- 9.8.2.33 Although embedded mitigation of impacts to this receptor would not necessarily require the establishment of AEZs, the magnitude of impact would be reduced by other embedded mitigation. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological potential (CoT64).
- 9.8.2.34 The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'
- 9.8.2.35 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.36 Application of embedded mitigation would result in direct impacts to geophysical anomalies of low archaeological potential being reduced, and, whilst some degree of loss cannot be wholly excluded, the intrinsic values of this receptor would be largely preserved.
- 9.8.2.37 Therefore, it is considered that the magnitude of direct impacts to geophysical anomalies of low archaeological potential in English and Scottish waters during the construction phase is considered to be **low**.

Significance of effect

- 9.8.2.38 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **low**. Therefore, the effect of direct impacts on geophysical anomalies of low archaeological potential in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.39 No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to geophysical anomalies of low archaeological potential

Receptor significance.

- 9.8.2.40 The sensitivity of geophysical anomalies of low archaeological potential in English and Scottish waters has been assessed as **medium** (**Paragraphs 9.8.2.27 and 9.8.2.28**).

Magnitude of impact

- 9.8.2.41 Construction activities also have the potential to indirectly impact geophysical anomalies of low archaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (**Paragraphs 9.8.2.5 and 9.8.2.6**).
- 9.8.2.42 Indirect impacts may cause similar damage or loss, resulting in similar changes to these values, however, the likely nature of this receptor suggests a greater capacity to resist potential indirect impacts. Likely comprising material of limited to no archaeological significance, this receptor has limited capacity to accommodate or recover from such impacts.
- 9.8.2.43 Application of the embedded mitigation measures would be reduced to levels unlikely to result in damage or loss and the intrinsic values of this receptor would be largely preserved. The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.44 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.45 Therefore, it is considered that the magnitude of indirect impacts to geophysical anomalies of low archaeological potential in English and Scottish waters during the construction phase is considered to be **low**.

Significance of effect

- 9.8.2.46 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **low**. Therefore, the effect of direct impacts on known archaeological sites and geophysical anomalies of low archaeological potential in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.47 No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to magnetic anomalies

Receptor sensitivity

- 9.8.2.48 Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment; however, they may represent wreck, wreck material or other entities of archaeological significance. No magnetic anomalies were identified which, with the current data, have been deemed likely to represent wrecks associated with other supporting evidence.
- 9.8.2.49 Wrecks may be considered of the highest value, with the potential to possess a combination of evidential, historical, aesthetic and communal values. Non-wreck related magnetic anomalies may hold moderate to negligible value, however, this cannot be refined further whilst uncertainty regarding their character and origin remains.

9.8.2.50 The uncertainty of the nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. The assessment provided is based upon a consideration of the low likelihood of high value remains, the likely moderate to negligible value of this receptor.

9.8.2.51 Therefore, the receptor sensitivity is considered to be **medium**.

Magnitude of impact

9.8.2.52 Construction activities also have the potential to directly impact magnetic anomalies. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (**Paragraphs 9.8.2.5 and 9.8.2.6**).

9.8.2.53 Direct impacts from construction activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, thus diminishing any intrinsic, contextual or associative held (equivalent to a maximum high magnitude of impact).

9.8.2.54 Although mitigation of impacts to this receptor would not necessarily require the establishment of AEZs, the magnitude of impact would be reduced by other embedded mitigation. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies (CoT64).

9.8.2.55 The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'

9.8.2.56 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.

9.8.2.57 The application of the embedded mitigation methods will result in any direct impacts to magnetic anomalies being reduced, however, some degree of loss cannot be wholly excluded.

9.8.2.58 Therefore, it is considered that the magnitude of direct impacts to magnetic anomalies in English and Scottish waters during the construction phase is considered to be **low**.

Significance of impact

9.8.2.59 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **low**. Therefore, the effect of direct impacts on magnetic anomalies in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

9.8.2.60 No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to magnetic anomalies

Receptor sensitivity

- 9.8.2.61 The sensitivity of magnetic anomalies in English and Scottish waters has been assessed as **medium** (**Paragraphs 9.8.2.48 and 9.8.2.50**).

Magnitude of impact

- 9.8.2.62 Construction activities also have the potential to indirectly impact magnetic anomalies. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (**Paragraphs 9.8.2.5 and 9.8.2.6**).
- 9.8.2.63 Indirect impacts from construction activities could result in the same permanent and irreversible damage or loss of this receptor or parts thereof as direct impacts, thus diminishing any intrinsic, contextual or associative held (equivalent to a maximum high magnitude of impact).
- 9.8.2.64 The application of the embedded mitigation methods will result in any indirect impacts to magnetic anomalies being reduced, however, some degree of loss cannot be wholly excluded. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.65 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.66 Therefore, it is considered that the magnitude of indirect impacts to magnetic anomalies in English and Scottish waters during the construction phase is considered to be **low**.

Significance of impact

- 9.8.2.67 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of indirect impacts is **low**. Therefore, the effect of direct impacts on magnetic anomalies in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.68 No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to unknown archaeological sites and remains

Receptor sensitivity

- 9.8.2.69 The potential for hitherto unidentified wrecks and archaeological remains has been established by the current baseline, presented within **Section 9.4**. Unknown archaeological remains may comprise:
- *In situ* prehistoric sites, submerged palaeolandforms, isolated prehistoric artefacts and palaeoenvironmental remains;
 - *Ex situ* prehistoric artefacts;
 - Wrecks and isolated maritime artefacts;
 - Aircraft remains.
- 9.8.2.70 *In situ* prehistoric sites, wrecks and aircraft remains may be considered the highest value. They have the potential to possess a combination of evidential, historical, aesthetic and communal values as per HE guidelines (English Heritage, 2008); or intrinsic, contextual and associative

characteristics, as per HES guidelines (2019a). Other remains may hold one or more of these values, however, as an unknown resource, it is not possible to refine further with the data available. Any remains of these types may also be able to contribute to regional, national and international research frameworks and objectives.

9.8.2.71 As unknown archaeological sites and remains have the potential to be of the highest value and to comprise assets such as wrecks, which would have no capacity to accommodate or recover from direct impacts.

9.8.2.72 Therefore, the receptor sensitivity is considered to be **high**.

Magnitude of impact

9.8.2.73 Construction activities also have the potential to directly impact unknown archaeological sites and remains of low archaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (see **Paragraphs 9.8.2.5 and 9.8.2.6**).

9.8.2.74 Direct impacts from construction activities could result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing any value held (equivalent to a maximum high magnitude of impact). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential (CoT64). Any such discoveries may then trigger other embedded mitigation, as appropriate (CoT64).

9.8.2.75 Embedded mitigation has been integrated into the MHPGC Project to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological review of future survey data (CoT64) (as an environmental measure) would reduce the likelihood of archaeological sites of the highest sensitivity remaining undetected and thus reduce the likelihood of these experiencing impacts from construction activities. Identification of new sites would then trigger a process through which appropriate embedded mitigation may be implemented, e.g. AEZs. The identification of new sites and any information gained on discovery and subsequent investigation has the potential to improve understanding of the character, extent and condition of any remains and allow suitable mitigation to be implemented beyond the MHPGC Project. Long-term awareness and preservation of a newly discovered site would meet the primary objective of policy, legislature and guidance in relation to cultural heritage (i.e. preservation *in situ*) and open the potential for the site to contribute to regional, national and/or international research objectives, as befitting its character and value. Discovery therefore can be considered to have a maximum high beneficial magnitude of effect (i.e. in the instance of a discovery of the highest value).

9.8.2.76 The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'

9.8.2.77 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.

9.8.2.78 Therefore, whilst discovery of new archaeological remains may in itself result in impacts, any subsequent potential impacts will be mitigated, based on the extent and nature of those remains (CoT64). Where instances of beneficial and adverse change must be compared, industry

guidance defers to professional judgement, informed by experience and expertise (English Heritage, 2008). Unknown archaeological remains cannot meaningfully contribute to understanding or appreciation of the historic environment and cannot be attributed value, whilst remaining unknown. As an unknown resource in an unknown location, they are also vulnerable to natural processes and human activities, the latter in the marine environment including seabed development, fishing and recreation.

- 9.8.2.79 It is therefore considered that the maximum high adverse magnitude of effect on discovery would be balanced by a maximum high beneficial magnitude, thereafter, resulting in an overall **negligible** magnitude.

Significance of impact

- 9.8.2.80 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts on unknown archaeological sites and remains in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.81 No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to unknown archaeological sites and remains

Receptor sensitivity

- 9.8.2.82 The sensitivity of the receptor has been assessed as **high** (Paragraphs 9.8.2.69 and 9.8.2.71).

Magnitude of impact

- 9.8.2.83 Construction activities also have the potential to indirectly impact unknown archaeological sites and remains. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Paragraphs 9.8.2.5 and 9.8.2.6).
- 9.8.2.84 Indirect impacts from construction activities could result in the same permanent and irreversible damage or loss of this receptor or parts thereof as direct impacts, thus diminishing any intrinsic, contextual or associative held (equivalent to a maximum high magnitude of impact).
- 9.8.2.85 The application of the embedded mitigation methods will result in any indirect impacts to magnetic anomalies being reduced, however, some degree of loss cannot be wholly excluded, and the process of discovery itself is likely to result in some degree of impact which may equate to the MDS, which would be irreversible damage or loss. However, the same consideration for the comparable beneficial and adverse impacts on this receptor, as outlined above (Paragraphs 9.8.2.69 to 9.8.2.79).
- 9.8.2.86 The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.87 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.88 Therefore, it is considered that the magnitude of indirect impacts to unknown archaeological sites and remains in English and Scottish waters during the construction phase is considered to be **negligible**.

Significance of impact

- 9.8.2.89 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of indirect impacts is **negligible**. Therefore, the effect of direct impacts on unknown archaeological sites and remains in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.90 No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to sub-seabed deposits of geoarchaeological potential

Receptor sensitivity

- 9.8.2.91 Units of the Forth Formation (Fth 2 and Fth 3) within the English nearshore (up to c. KP10) have moderate potential for remains of geoarchaeological interest, and low for *in situ* prehistoric remains. The remaining units have been assessed as low and very low respectively.
- 9.8.2.92 Geoarchaeological remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of geoarchaeological remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint of the MHPGC Project (i.e. the comparatively narrow MHPGC Project PEIR Red Line Boundary limiting the extent of the MDS across what are likely to be geographically much wider geological deposits) suggest that the receptor has proportionally some capacity to accommodate direct impacts, would be unlikely to experience a significant degree of loss or damage.
- 9.8.2.93 Therefore, the receptor sensitivity is considered to be **medium**.

Magnitude of impact

- 9.8.2.94 Construction activities also have the potential to directly impact sub-seabed deposits of geoarchaeological deposits. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (**Paragraphs 9.8.2.5 and 9.8.2.6**).
- 9.8.2.95 The baseline assessment has identified a locally low potential for sub-seabed deposits of geoarchaeological potential between KP0 and KP10 in English waters, and very low elsewhere.
- 9.8.2.96 Archaeological involvement in the planning of any future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPGC Project, as detailed within **Table 9.20** (CoT64). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'
- 9.8.2.97 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.98 Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking any ground truthing activities (boreholes and VCs) could introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to

regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired.

- 9.8.2.99 Therefore, it is considered that the magnitude of direct impacts to sub-seabed deposits of geoarchaeological potential in English and Scottish waters during the construction phase is considered to be **negligible**.

Significance of impact

- 9.8.2.100 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts on sub-seabed deposits of geoarchaeological potential in English and Scottish waters, during the construction phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.101 No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the construction phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

Indirect impacts to sub-seabed deposits of geoarchaeological potential

Receptor sensitivity

- 9.8.2.102 The receptor sensitivity has been assessed as **medium** (Paragraphs 9.8.2.91 and 9.8.2.92).

Magnitude of impact

- 9.8.2.103 Construction activities also have the potential to indirectly sub-seabed deposits of geoarchaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Paragraphs 9.8.2.5 and 9.8.2.6). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.104 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.105 The assessment of the magnitude of impact for indirect impacts is the same as that for direct impacts.
- 9.8.2.106 Therefore, it is considered that the magnitude of indirect impacts to sub-seabed deposits of geoarchaeological potential in English and Scottish waters during the construction phase is considered to be **negligible**.

Significance of impact

- 9.8.2.107 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts on unknown archaeological sites and remains in English and Scottish waters, during the construction phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.108 No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the construction phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

O&M phase

Direct and indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters

Receptor sensitivity

9.8.2.109 The receptor sensitivity has been assessed as **high** (Paragraphs 9.8.2.1 and 9.8.2.2).

Magnitude of impact

9.8.2.110 Activities during the operation phase of the MHPGC Project have the potential to result in direct and/or indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Such activities may include:

- Cable remediation;
- Cable repair.

9.8.2.111 The pathway for direct impacts during cable replacement/ repair would comprise equipment used for cable de-burial (which relates to uncovering a subsea asset from beneath the seabed) (if applicable) and the laying back of cables upon the seabed. The potential for impacts through this pathway would be applicable throughout the offshore export corridor.

9.8.2.112 The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity.

9.8.2.113 The direct impacts assessment for known archaeological sites and geophysical anomalies of high and medium archaeological potential is the same for operational activities as for construction activities (Paragraphs 9.8.2.5 to 9.8.2.8). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'

9.8.2.114 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.

9.8.2.115 Therefore, it is considered that the magnitude of direct impacts to known archaeological sites and geophysical anomalies of high and medium potential in English and Scottish waters during the O&M phase is considered to be **negligible**.

Significance of effect

9.8.2.116 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters during the O&M phase is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

9.8.2.117 No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters

Receptor sensitivity

9.8.2.118 The receptor sensitivity has been assessed as **high** (Paragraphs 9.8.2.1 and 9.8.2.2).

Magnitude of impact

- 9.8.2.119 Operational activities also have the potential to indirectly impact known archaeological sites and geophysical anomalies of high and medium archaeological potential. Such activities, their distribution and impact pathways would be the same as for direct impacts (Paragraphs 9.8.2.110 and 9.8.2.111).
- 9.8.2.120 Indirect impacts arising from operational activities also have the potential to affect this receptor, such as sediment transportation and redeposition and removal of sediments supporting wreck material, resulting in destabilisation and damage. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. As outlined in **Paragraph 9.8.2.21**, potential beneficial impacts arising from SSC cannot be accurately determined at this time. As this potential effect cannot be quantified alongside the currently available data, it is noted as a potential effect but is not considered further within this assessment.
- 9.8.2.121 The indirect impacts assessment for known archaeological sites and geophysical anomalies of high and medium archaeological potential is the same for operational activities as for construction activities (Paragraphs 9.8.2.15 to 9.8.2.24). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an “Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.”
- 9.8.2.122 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.123 Therefore, it is considered that the magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters during the O&M phase is considered to be **negligible**.

Significance of effect

- 9.8.2.124 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of indirect impacts is **negligible**. Therefore, the effect of indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters during the O&M phase is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.125 No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to geophysical anomalies of low archaeological potential

Receptor sensitivity

- 9.8.2.126 The receptor sensitivity has been assessed as **medium** (Paragraphs 9.8.2.135 and 9.8.2.138).

- 9.8.2.127 However, should further investigations or surveys provide additional information that might result in a re-classification of a geophysical anomaly of low potential (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied.

Magnitude of impact

- 9.8.2.128 Operational activities also have the potential to indirectly directly impact geophysical anomalies of low archaeological potential. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (**Paragraphs 9.8.2.110 and 9.8.2.111**).
- 9.8.2.129 The direct impacts assessment for geophysical anomalies of low archaeological potential is the same for operational activities as for construction activities (**Paragraphs 9.8.2.31 to 9.8.2.36**). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'
- 9.8.2.130 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.131 Therefore, it is considered that the magnitude of direct impacts to geophysical anomalies of low archaeological potential in English and Scottish waters during the O&M phase is considered to be **low**.

Significance of effect

- 9.8.2.132 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **low**. Therefore, the effect of direct impacts on known archaeological sites and geophysical anomalies of low archaeological potential in English and Scottish waters, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.133 No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to geophysical anomalies of low archaeological potential

Receptor significance.

- 9.8.2.134 The sensitivity of the receptor has been assessed as **medium** (**Paragraphs 9.8.2.134 and 9.8.2.135**).

Magnitude of impact

- 9.8.2.135 Operational activities also have the potential to indirectly impact geophysical anomalies of low archaeological potential. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (**Paragraphs 9.8.2.110 and 9.8.2.111**).
- 9.8.2.136 The indirect impacts assessment for geophysical anomalies of low archaeological potential is the same for operational activities as for construction activities (**Paragraphs 9.8.2.41 and 9.8.2.43**). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore

WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.”

- 9.8.2.137 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.138 Therefore, it is considered that the magnitude of indirect impacts to geophysical anomalies of low archaeological potential in English and Scottish waters during the O&M phase is considered to be **low**.

Significance of effect

- 9.8.2.139 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **low**. Therefore, the effect of indirect impacts on known archaeological sites and geophysical anomalies of low archaeological potential in English and Scottish waters, during the construction phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.140 No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to magnetic anomalies

Receptor sensitivity

- 9.8.2.141 The sensitivity of the receptor has been assessed as **medium** (Paragraphs 9.8.2.48 to 9.8.2.51).

Magnitude of impact

- 9.8.2.142 Operational activities also have the potential to directly impact magnetic anomalies. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (Paragraphs 9.8.2.110 and 9.8.2.111).
- 9.8.2.143 The direct impacts assessment for magnetic anomalies is the same for operational activities as for construction activities (Paragraphs 9.8.2.52 to 9.8.2.57). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an ‘Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.’
- 9.8.2.144 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.145 Therefore, it is considered that the magnitude of direct impacts to magnetic anomalies in English and Scottish waters during the O&M phase is considered to be **low**.

Significance of impact

- 9.8.2.146 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **low**. Therefore, the effect of direct impacts on magnetic anomalies in English and Scottish waters, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.147 No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to magnetic anomaliesReceptor sensitivity

- 9.8.2.148 The sensitivity of the receptor has been assessed as **medium** (Paragraphs 9.8.2.156 and 9.8.2.159).

Magnitude of impact

- 9.8.2.149 Operational activities also have the potential to indirectly impact magnetic anomalies. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (Paragraphs 9.8.2.110 and 9.8.2.111).
- 9.8.2.150 The indirect impacts assessment for magnetic anomalies is the same for operational activities as for construction activities (Paragraphs 9.8.2.62 and 9.8.2.64). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.151 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.152 Therefore, it is considered that the magnitude of indirect impacts to magnetic anomalies in English and Scottish waters during the O&M phase is considered to be **low**.

Significance of impact

- 9.8.2.153 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of indirect impacts is **low**. Therefore, the effect of indirect impacts on magnetic anomalies in English and Scottish waters, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.154 No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to unknown archaeological sites and remainsReceptor sensitivity

- 9.8.2.155 The receptor sensitivity has been assessed as **high** (Paragraphs 9.8.2.69 and 9.8.2.71).

Magnitude of impact

- 9.8.2.156 Operational activities also have the potential to directly impact unknown archaeological sites and remains. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (Paragraphs 9.8.2.110 and 9.8.2.111).
- 9.8.2.157 The impact assessment for unknown archaeological sites and remains is the same for operational activities as for construction activities (Paragraphs 9.8.2.73 to 9.8.2.82). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments**

Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'

- 9.8.2.158 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.159 Therefore, it is considered that the magnitude of direct impacts to magnetic anomalies in English and Scottish waters during the O&M phase is considered to be **negligible**.

Significance of impact

- 9.8.2.160 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts on unknown archaeological sites and remains in English and Scottish waters, during the O&M phase, is considered to be **minor**, which is significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.161 No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Indirect impacts to unknown archaeological sites and remains

Receptor sensitivity

- 9.8.2.162 The receptor sensitivity has been assessed as **high** (**Paragraphs 9.8.2.177 and 9.8.2.181**).

Magnitude of impact

- 9.8.2.163 Operational activities also have the potential to indirectly impact unknown archaeological sites and remains. Such activities, their distribution and impact pathways would be the same as for indirect impacts to known archaeological sites and geophysical anomalies of high and medium potential (**Paragraphs 9.8.2.110 and 9.8.2.111**).
- 9.8.2.164 The impact assessment for unknown archaeological sites and remains is the same for operational activities as for construction activities (**Paragraphs 9.8.2.83 and 9.8.2.85**). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."
- 9.8.2.165 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.166 Therefore, it is considered that the magnitude of direct impacts to magnetic anomalies in English and Scottish waters during the O&M phase is considered to be **negligible**.

Significance of impact

- 9.8.2.167 Overall, it is considered that the receptor sensitivity is **high** and the magnitude of indirect impacts is **negligible**. Therefore, the effect of direct impacts on unknown archaeological sites and

remains in English and Scottish waters, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.168 No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the O&M phase, is considered to be **minor**, which is not significant in EIA terms.

Direct impacts to sub-seabed deposits of geoarchaeological potential

Receptor sensitivity

- 9.8.2.169 The receptor sensitivity has been assessed as **medium** (Paragraphs 9.8.2.91 and 9.8.2.92).

Significance of impact

- 9.8.2.170 Operational activities also have the potential to impact sub-seabed deposits of geoarchaeological potential. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (Paragraphs 9.8.2.110 and 9.8.2.111).
- 9.8.2.171 The direct impacts assessment for sub-seabed deposits of geoarchaeological potential is the same for operational activities as for construction activities (Paragraphs 25.10.20 to 25.10.26). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'
- 9.8.2.172 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.173 Therefore, it is considered that the magnitude of direct impacts to sub-seabed deposits of geoarchaeological potential in English and Scottish waters during the O&M phase is considered to be **negligible**.

Significance of impact

- 9.8.2.174 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **negligible**. Therefore, the effect of direct impacts on sub-seabed deposits of geoarchaeological potential in English and Scottish waters, during the O&M phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.175 No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the O&M phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

Indirect impacts to sub-seabed deposits of geoarchaeological potential

Receptor sensitivity

- 9.8.2.176 The receptor sensitivity has been assessed as **medium** (Paragraphs 9.8.2.91 and 9.8.2.92).

Magnitude of impact

- 9.8.2.177 Operational activities also have the potential to indirectly impact sub-seabed deposits of geoarchaeological potential. Such activities, their distribution and impact pathways would be the same as for direct impacts to known archaeological sites and geophysical anomalies of high and medium potential (Paragraphs 9.8.2.110 and 9.8.2.111).

- 9.8.2.178 The indirect impact assessment for sub-seabed deposits of geoarchaeological potential is the same for operational activities as for construction activities (**Paragraphs 9.8.2.94 to 9.8.2.98**). The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an “Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.”
- 9.8.2.179 The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.
- 9.8.2.180 Therefore, it is considered that the magnitude of indirect impacts to sub-seabed deposits of geoarchaeological potential in English and Scottish waters during the O&M phase is considered to be **negligible**.

Significance of impact

- 9.8.2.181 Overall, it is considered that the receptor sensitivity is **medium** and the magnitude of direct impacts is **negligible**. Therefore, the effect of indirect impacts on sub-seabed deposits of geoarchaeological potential in English and Scottish waters, during the O&M phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

Additional mitigation and residual effect

- 9.8.2.182 No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the O&M phase, is considered to be **negligible or minor**, which is not significant in EIA terms.

9.8.3 Decommissioning phase

- 9.8.3.1 The MDS will involve the removal of all export cables and cable protection within the parameters identified for construction (whilst it may also be the case that leaving some elements in place would be less environmentally impactful, this does not currently constitute the MDS).
- 9.8.3.2 Where decommissioning impacts are within the footprint of previous phases, the significance of impact for marine and intertidal archaeology receptors will be the same as those identified for the construction and O&M phases.
- 9.8.3.3 Although assets may have been identified prior to or during preceding phases, further assets may remain undetected and accurate assessment will likely require renewed access to relevant heritage data sources for new assets. Additionally, where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience both direct and indirect impacts.
- 9.8.3.4 However, it is anticipated that the significance of impact will be the same as those already established for the construction and O&M phases. A summary of the effects is presented in **Section 9.13.1 (Table 9.44)**.

9.9 Cumulative effects

9.9.1 Whole project assessment and Cumulative Effects Assessment methodology

- 9.9.1.1 The Morven Programme comprises four distinct projects: Morven North, Morven South, the MHPGC Project and Morven Branxton Area Grid Connection Project (MBAGC Project).
- 9.9.1.2 The following assessment scenarios have been considered to identify the Likely Significant Effects (LSE) of the MHPGC Project in combination with other projects on the same receptor, as follows (and summarised in **Table 9.21**):
- Whole project assessment: to identify the potential impacts associated with the MHPGC Project together with Morven North and Morven South in turn, (Scenario 1: Morven North and Scenario 2: Morven South), each of which would comprise a “Whole Project”;
 - Morven Programme assessment: to identify potential impacts associated with all four components of the Morven Programme (Morven North, Morven South, the MHPGC Project, and the MBAGC Project) together with other relevant projects, plans and activities (Scenario 3);
 - Cumulative Effects Assessment (CEA): to identify the potential impacts associated with the MHPGC Project together with relevant projects, plans and activities, including other components of the Morven Programme, using a tiered approach (Scenario 4).
- 9.9.1.3 The whole project assessment and CEA have been undertaken in accordance with the methodology described in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 9.21: Scenarios to be considered in the MHPGC Project whole project assessment and Cumulative Effects Assessment for marine and intertidal archaeology

Whole project assessment		Morven Programme assessment (Offshore Ornithology and Shipping and Navigation chapters only)	CEA
Scenario 1	Scenario 2	Scenario 3	Scenario 4
MHPGC Project and Morven North	MHPGC Project and Morven South	MHPGC Project, Morven North, Morven South and MBAGC Project	MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in

- 9.9.1.4 For the purposes of this marine and intertidal archaeology chapter, Scenarios 1, 2, and 4 have been taken forward for assessment; Scenario 3 has not been included as it is not applicable to this chapter. As discussed in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**, the Morven Programme assessment (Scenario 3) is only required for specific chapters to provide further context to, and to support, the conclusions of the CEA scenario (Scenario 4), in agreement with the relevant stakeholders for these topics. As Scenario 3 does not form the basis of the CEA conclusions, it is considered a supplementary assessment to the CEA scenario (Scenario 4) for these specific topics. The approach to Cumulative Effects Assessment presented in this marine and intertidal archaeology chapter complies with the requirements under the EIA Regulations to assess the LSE on the environment arising from a project cumulatively with other relevant plans, projects and activities, and no supplementary assessment of the Morven Programme (Scenario 3) is required or has been requested by relevant stakeholders with regard to marine and intertidal archaeology.
- 9.9.1.5 The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see **Volume 1, Annex 4.4: Cumulative Screening and Location Plan, of the PEIR**). The results of this screening exercise were reviewed alongside the

subsequent refinement of the marine and intertidal archaeology ZOI (see Paragraphs 9.6.1.3 and 9.6.1.4). The refined ZOI of 500m measured from the MHPGC Project Red Line Boundary up to MHWS has been used to define the shortlist of projects taken forward for the marine and intertidal archaeology cumulative effects assessment. Each project or plan has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

- 9.9.1.6 In undertaking the CEA for the MHPGC Project, it should be noted that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside the MHPGC Project. Therefore, a tiered approach has been adopted, whereby all third-party projects and plans considered have been allocated into 'tiers' reflecting their current stage within the planning and development process. This provides a framework for placing relative weight upon the potential for each project/plan included in the CEA to ultimately be realised, based upon the project/plan's current stage of maturity and certainty in the project/plan's parameters. The tiered approach utilised within the MHPGC Project CEA employs the following tiers:
- Tier 1 assessment – Existing developments either built (operational) or under construction²; approved developments awaiting implementation; and permitted/submitted application(s), but not yet determined, plus Morven North and Morven South.
 - Tier 2 assessment – All plans/projects assessed under Tier 1, plus plans/projects where a scoping report has been submitted and is in the public domain.
 - Tier 3 assessment – All plans/projects assessed under Tier 1 and 2, plus MBAGC Project, and plans/projects that are reasonably foreseeable (e.g. projects identified in development plans, projects in other plans and programmes, offshore renewable energy projects that have a Crown Estate Scotland Lease Option Agreement).
- 9.9.1.7 The specific projects and plans screened into the CEA for marine and intertidal archaeology are outlined in **Table 9.22**.
- 9.9.1.8 All potential impacts from the MHPGC Project alone assessment have been scoped into the CEA (listed in **Table 9.23**).
- 9.9.1.9 Similarly, some of the potential impacts considered within the MHPGC Project alone assessment are specific to a particular phase of development (e.g. construction, O&M or decommissioning). Where cumulative effects with other plans or projects only have potential to occur where there is spatial or temporal overlap with the MHPGC Project during certain phases of development, impacts associated with a certain phase may be omitted from further consideration where no plans or projects have been identified that have the potential for cumulative effects during this period.
- 9.9.1.10 The cumulative study area for direct impacts is the MHPGC Project PEIR Red Line Boundary. This encompasses projects where there is both a temporal and spatial overlap, and where construction and O&M activities pertaining to those projects could impact marine and intertidal archaeology receptors identified for the MHPGC Project PEIR Red Line Boundary.
- 9.9.1.11 Indirect impacts result from changes to SSC, which have the potential to adversely impact marine and intertidal archaeology receptors. The cumulative study area for indirect impacts was initially up to 9km from the MHPGC Project Peir Red Line Boundary, this being the ZOI created by the

² Note that existing developments are included in Tier 1 CEA long list but are generally screened out of the CEA assessments, aside from the following exceptions:

1) Existing developments which were not present at the time of baseline characterisation, where a potential cumulative impact-receptor pathway has been identified.

2) Existing developments are screened into tier 1 assessments for specific topics where there is a large conceptual, temporal and spatial overlap between project impacts. In these instances, the potential for ongoing effects through cumulative impact-receptor pathways throughout project lifetime, across the development phases, means that they are considered within quantitative assessment for these topic CEAs (e.g., offshore ornithology assessments consider the cumulative effects of operational offshore wind farms).

maximum tidal range by which it is possible for SSCs to be transported. A short list of projects was originally identified within this 9km study area and are outlined within **Table 9.22**.

- 9.9.1.12 This shortlist was further refined, based on the assessment of SSC transportation detailed within **Volume 2, Chapter 1: Physical Processes, of the PEIR** which determined that, beyond 500m, changes to SSC will be negligible (see above, **Section 9.6.1, Paragraphs 9.6.1.3 and 9.6.1.4**; and **Section 9.8.2, Paragraphs 9.8.2.16 to 9.8.2.19**). Therefore, the cumulative assessment for indirect impacts only encompasses projects which temporally overlap and are within 500m of the MHPGC Project PEIR Red Line Boundary (see below, **Section 9.10.3; Table 9.27**).

Table 9.22: Shortlist of other projects and plans within the study area for the Cumulative Effects Assessment for direct and indirect impacts to marine and intertidal archaeology

Project/plan	Status	Distance from MHPGC Project (km)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Tier 1						
Offshore wind projects and associated cables						
Morven North	Application submitted/awaiting decision	0	Proposed for up to 96 turbines.	2033-2042	2038 to 2073-2077	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Morven South	Application submitted, awaiting decision	0	Proposed for up to 95 turbines.	2033-2042	2038 to 2073-2077	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Ossian	Application submitted, awaiting submission	5.50	Floating OWF	2031-2034	2034 onwards	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project
Other cables and pipelines						

Project/plan	Status	Distance from MHPGC Project (km)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
NO-UK Telecom Cable	Active	0	Telecom cable	N/A	N/A	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
Havhingsten Seg 2 Telecom Cable	Active	0	Telecom cable	N/A	N/A	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
North Sea Link North Power Cable	Active	0	Power cable	N/A	N/A	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
Eastern Green Link 1	Under Construction	0.50	Power cable	2026-2029	2030 onwards	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project (km)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Eastern Green Link 2	Under Construction	0	Power cable	2026-2028	2029 onwards	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
Berwick Bank ECC (Cambois Connection – Northumberland)	Consented	0.25	OWF	2028-2031	232 onwards	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
Aggregate & Disposal Sites						
Noses Point (TY130)	Open	0.16	Disposal	N/A	N/A	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project (km)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Souter Point (Outer) (TY081)	Open	4.50	Disposal	N/A	N/A	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
Sunderland (TY090)	Open	5.43	Disposal	N/A	N/A	Yes. Overlap of operation phase with the construction or operational phases of MHPGC Project.
Tier 2						
Other cables and pipelines						
Eastern Green Link 3 subsea cable	Scoping Report Published	2.33	2 GW HVDC link between Fife and King's Lynn	2027-2033	2034 onwards	Yes. Potential for construction phase or operational phase to interact with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project (km)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Eastern Green Link 4 subsea cable	Scoping Report Published	0	2 GW HVDC link between Fife and King's Lynn and West Norfolk	2028-2032	2033 onwards	Yes. Overlap of operational phase with the construction or operational phases of MHPGC Project.
Eastern Green Link 5 subsea cable	English Section - Scoping Report Published	3.10	2 GW HVDC link between Aberdeenshire and Lincolnshire.	Unknown	Unknown	Unknown Construction, O&M and decommissioning phases may overlap with MHPGC Project construction, O&M and decommissioning phases.
Tier 3						
Offshore wind projects and associated cables						
MBAGC Project	Pre-application	0	Potential transmission for Morven North or Morven South	Unknown	Unknown	Unknown. Construction, O&M and decommissioning phases may overlap with MHPGC Project construction, O&M and

Project/plan	Status	Distance from MHPGC Project (km)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
						decommissioning phases.

9.9.2 Maximum Design Scenario – Whole project assessment and Cumulative Impacts Assessment

- 9.9.2.1 The MDSs identified in **Table 9.23** have been selected as those having the potential to result in the greatest potential effect on an identified receptor or receptor group in relation to the whole project assessment and CEA. The MDSs have been based on the MHPGC Project alone assessment MDS (**Table 9.19**), as well as publicly available information on other third-party projects and plans that have been screened into the CEA (**Table 9.22**). Where applicable, the Morven North and Morven South alone assessment MDSs, and project information available for MBAGC Project have also informed the MDSs outlined in **Table 9.23**.

Table 9.23: Maximum Design Scenario considered for the assessment of potential whole and cumulative effects on marine and intertidal archaeology

Potential Effect	Phase ³⁴			Maximum Design Scenario	Justification
	C	O	D		
Direct impacts to known archaeological sites and geophysical anomalies of high or medium potential receptors resulting in damage or loss.	✓	✓	✓	Scenario 1 MDS as described for the MHPGC Project (Table 9.19), assessed cumulatively with Morven North. Scenario 2 MDS as described for the MHPGC Project (Table 9.19), assessed cumulatively with Morven South. Scenario 4 MDS as described for the MHPGC Project (Table 9.19), assessed cumulatively with the following other projects and plans: Tier 1 Offshore Wind Farm projects: Morven North (Construction phase); Morven South (Construction phase); Cables: NO-UK Telecom Cable (O&M phase); Havhingsten Seg 2 Telecom Cable (O&M phase); North Sea Link North Power Cable (O&M phase); Eastern Green Link 2 Subsea Cable (O&M phase);	Projects and plans included within these scenarios involve activities that may result in direct impacts and damage to marine and intertidal archaeology receptors or loss of associated material. These effects are likely to be localised, but should they occur, they could lead to adverse and irreversible damage to known or previously undiscovered heritage assets. Where spatial and temporal overlap occurs with the MHPGC Project, these activities may act cumulatively and are therefore considered to represent a realistic MDS.

³ C= Construction, O= Operations and maintenance, D= Decommissioning phases⁴ "✓" is used to denote the phase the potential impact can occur, "X" outlines there is no impact within this project phase

Potential Effect	Phase ³⁴			Maximum Design Scenario	Justification
	C	O	D		
				Tier 2 Cables: Eastern Green Link 4 (O&M phase); Tier 3 Cables: MBAGC Project.	
Direct impacts to geophysical anomalies of low potential resulting in damage or loss.	✓	✓	✓	As above.	
Direct impacts to magnetic anomalies resulting in damage or loss.	✓	✓	✓	As above.	
Direct impacts to unknown archaeological sites and remains resulting in damage or loss.	✓	✓	✓	As above.	
Direct impacts to sub-seabed deposits of geoarchaeological potential resulting in damage or loss.	✓	✓	✓	As above.	
Indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential resulting from	✓	✓	✓	Scenario 1 MDS as described for the MHPGC Project (Table 9.19), assessed cumulatively with Morven North. Scenario 2	Projects and plans included within these scenarios involve activities that may result in indirect impacts and damage to marine and intertidal archaeology

Potential Effect	Phase ³⁴			Maximum Design Scenario	Justification
	C	O	D		
sediment disturbance and redeposition.				MDS as described for the MHPGC Project (Table 9.19), assessed cumulatively with Morven South. Scenario 4 MDS as described for the MHPGC Project (Table 9.19), assessed cumulatively with the following other projects and plans: Tier 1 Offshore Wind Farm projects: Morven North (Construction phase); Morven South (Construction phase); Cables: NO-UK Telecom Cable (O&M phase); Havingstun Seg 2 Telecom Cable (O&M phase); North Sea Link North Power Cable (O&M phase); Eastern Green Link 2 Subsea Cable (O&M phase); Tier 2 Cables: Eastern Green Link 4 (O&M phase); Tier 3 Cables: MBAGC Project.	receptors or loss of associated material. Indirect impacts may result from any activities interacting with the seabed as they have the potential to mobilise sediments which may subsequently travel before redepositing. Redeposited sediments, if in sufficient volume, may compact and damage marine and intertidal archaeology receptors. Indirect impacts may also result from activities involving sediment removal which has the potential to destabilise archaeological remains that have previously been supported by these sediments, or expose remains to subsequent impacts from natural processes, leading to damage or loss. Where spatial and temporal overlap occurs with the MHPGC Project, these activities may act cumulatively and are therefore considered to represent a realistic MDS.

Potential Effect	Phase ³⁴			Maximum Design Scenario	Justification
	C	O	D		
Indirect impacts to geophysical anomalies of low potential resulting from sediment disturbance and redeposition.	✓	✓	✓	As above.	
Indirect impacts to magnetic anomalies resulting from sediment disturbance and redeposition.	✓	✓	✓	As above.	
Indirect impacts to unknown archaeological sites and remains resulting from sediment disturbance and redeposition.	✓	✓	✓	As above.	
Indirect impacts to sub-seabed deposits of geoarchaeological potential resulting from sediment disturbance and redeposition.	✓	✓	✓	As above.	

9.10 Whole project assessment and Cumulative Impacts Assessment

9.10.1 Overview

- 9.10.1.1 A description of the significance of whole project and cumulative effects upon marine and intertidal archaeology receptors arising from each identified impact is given below. The whole project assessment and CEA for the MHPGC Project is presented in **Table 9.24** to **Table 9.43**.

9.10.2 Direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

- 9.10.2.1 There is potential for cumulative direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential as a result of activities associated with the MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 9.10.2.2 The summary of the whole project assessment for 'Direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential' is presented in **Table 9.24** and the summary of the Cumulative Effects Assessment is presented in **Table 9.25**.

Table 9.24: MHPGC Project whole project assessment for direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Known archaeological sites and geophysical anomalies of high or medium archaeological potential consist of known wrecks, or possible wrecks/wreck related material which could carry the same value as known wrecks. This value, derived in part from the cohesion of archaeological material and its primary context, would be diminished by adverse direct impacts, which could result in permanent and irreversible damage or loss (or both) of this receptor or parts thereof. This receptor has no capacity to accommodate or recover from such impacts. The sensitivity of this receptor is therefore summarised as high. This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities, including seabed preparation, have the potential to result in direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Such activities may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • UXO low order clearance; • Cable crossings. The pathways for impacts during site preparation comprise use of ploughs, PLGR, MFE, and vessel anchoring. Pathways for impacts from construction activities would include trenching/excavation for cable laying, cable laying directly on the seabed and cable installation at landfall, along with vessel anchoring/jack-up. Landfall impacts would be applicable to the nearshore zones only, whilst site preparation, cable laying-related and vessel anchoring/jack-up impacts may occur throughout the MHPGC Project PEIR Red Line Boundary. These activities have the potential to damage and disperse archaeological remains. Direct impacts from construction phase activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Such activities may also result in dispersal of remains that contribute to the total value of this receptor, leading to a reduction in that value. The establishment and adherence to AEZs or TAEZs (CoT64) throughout the MHPGC Project's construction phase would remove the pathway for whole project impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each asset of this receptor, within	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	which no construction activities will take place. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Further embedded mitigation relates to archaeological input into specifications and archaeological analysis of further pre-construction surveys, such as geophysical, geotechnical, UXO or ROV/ diver surveys (CoT64). The embedded mitigation will be secured through deemed Marine Licence/Marine Licence and relevant conditions outlined therein. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Therefore, it is considered that the whole project assessment for the magnitude of direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters, during the construction phase, is considered to be negligible.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is high and the whole project magnitude of direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential is negligible . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction and O&M phases.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as negligible .	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.25: MHPGC Project CEA for direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

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Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects	
Construction phase	
Sensitivity of receptor	Known archaeological sites and geophysical anomalies of high or medium archaeological potential consist of known wrecks, or possible wrecks/wreck related material which could carry the same value as known wrecks. This value, derived in part from the cohesion of archaeological material and its primary context, would be diminished by adverse direct impacts, which could result in permanent and irreversible damage or loss (or both) of this receptor or parts thereof. This receptor has no capacity to accommodate or recover from such impacts. The sensitivity of the receptor is therefore considered to be high. This is applicable to both English and Scottish waters.
Magnitude of impact	Spatial or temporal overlap of construction activities of the scoped-in projects with the MHPGC Project activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative direct impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. <u>Tier 1</u> Tier 1 projects scoped into the assessment are: • Morven North; • Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable;

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- North Sea Link North Power Cable;
- Eastern Green Link 2.

There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHPGC Project. Spatial overlap of construction or O&M activities of these projects with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints.

Cumulative direct impacts from the MHPGC Project and Tier 1 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context.

The establishment and adherence to AEZs or TAEZs (CoT64) throughout the MHPGC Project's construction phase would remove the pathway for cumulative direct impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each asset of this receptor, within which no construction activities will take place. The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."

The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. It is also anticipated that Tier 1 projects have committed to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor.

Therefore, within both English and Scottish waters, it is considered that the cumulative magnitude of direct impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential with Tier 1 projects and plans is considered to be **negligible**.

Tier 2

The only Tier 2 project scoped into the assessment is Eastern Green Link 4.

The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential.

The establishment and adherence to AEZs or TAEZs (CoT64) throughout the MHPGC Project's construction phase would remove the pathway for cumulative direct impacts to known archaeological sites and geophysical anomalies of high and

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medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each asset of this receptor, within which no construction activities will take place. The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'

The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.

Eastern Green Link 4 has committed to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor.

The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as **negligible** within both English and Scottish waters.

Tier 3

The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase.

Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential.

Cumulative direct impacts from the MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context.

The establishment and adherence to AEZs or TAEZs (CoT64) throughout the MHPGC Project's construction phase would remove the pathway for cumulative direct impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each asset of this receptor, within which no construction activities will take place. The Applicant has made a commitment (CoT63 of **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."

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	The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. It is also anticipated that Tier 3 projects will commit to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as negligible within both English and Scottish waters.
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be negligible , and the sensitivity of the receptor is high . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction and O&M phases.
Magnitude of impact	Negligible in both English and Scottish waters, as per construction and O&M phases.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction and O&M phases.

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Further mitigation and residual effect	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.
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9.10.3 Indirect impacts to impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

- 9.10.3.1 Indirect impacts have been scoped into the CEA for marine and intertidal for all short-listed projects, due to the presence of potential pathways. This shortlist was created based on the 9km Zol (the maximum tidal range by which SSCs could be transported).
- 9.10.3.2 Indirect impacts may result from changes to SSC and changes to sediment transport pathways. The two zones of effect most likely to have the potential to results in indirect impacts are 0m to 50m and 50m to 500m, along the tidal axis (see **Volume 2, Chapter 1: Physical Processes, of the PEIR**). The potential for indirect impacts to marine and intertidal archaeology receptors beyond 500m from the site of disturbance is negligible (see above, **Paragraphs 9.8.2.16 and 9.8.2.19**), allowing further refinement of the shortlisted projects.
- 9.10.3.3 The summary of the whole project assessment for 'Indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential' is presented in **Table 9.26** and the summary of the Cumulative Effects Assessment is presented in **Table 9.27**.

Table 9.26: MHPGC Project whole project assessment for indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Known archaeological sites and geophysical anomalies of high or medium archaeological potential consist of known wrecks, or possible wrecks/wreck related material which could carry the same value as known wrecks. This value, derived in part from the cohesion of archaeological material and its primary context, would be diminished by adverse indirect impacts, which could result in permanent and irreversible damage or loss (or both) of this receptor or parts thereof. This receptor has no capacity to accommodate or recover from such impacts. The sensitivity of this receptor is therefore summarised as high.	
Magnitude of impact	The results of detailed marine physical processes assessments were consulted to determine the potential for indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential through other pathways. Volume 2, Chapter 1: Physical Processes, of the PEIR concluded that construction activities would generate a very high, near-field (5 to 10m) SSC along the tidal axis (broadly parallel to the coastline). The tidal axis and extent of a single spring tidal excursion has been used as the MDS. The maximum tidal excursion buffer varies throughout the MHPGC Project PEIR Red Line Boundary (see Volume 2, Chapter 1: Physical Processes, of the PEIR for further detail): • Offshore Scottish waters: <6km; • Offshore English waters: <6km; • Nearshore English waters: <9km. An increase in SSC would last for the duration of the disturbance and up to 30 minutes thereafter. A large proportion of this sediment would settle on the seabed within 10m of the activity, with the actual amount depending on the grain size and flow conditions. Whilst pre-lay cable trenching may be carried out by mechanical cutting, jet trenching, ploughing or CFE, jet trenching has been assumed as the MDS as it will generate the highest SSC concentrations (see above, Table 9.19). The following additional assumptions were made: • Sediment releases would create a long, relatively thin plume extending along the tidal axis to the tidal excursion buffer from the point of disturbance. • Spring tide conditions would carry sediment at a faster rate and disperse over a larger area and water volume, resulting in a lesser SSC in the sediment plume than a comparable neap tide. • Slack water conditions would see denser sediment plumes and increased SSC within. Advection and dispersal would be slower to return the SSC to background levels.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	- The limited footprint of the plume means that specific locations will only be affected by the increase in SSC for the limited duration for the plume to be advected. - The path followed by the tidal ellipse is not the same on every tide, therefore, it is unlikely that the same area of seabed will be affected by higher SSC within the localised plume for more than one or two consecutive tides. Four zones of effect were identified: 0m to 50m from activity: zone of highest SSC increase and greatest likely thickness of redeposition. Will primarily comprise coarser sand and gravel depositing in thickness of tens of centimetres to several metres, with greater deposition closer to the site of disturbance (e.g. 1.26m thickness of redeposited sediment at 5m distance; 0.63m at 10m; 0.126m at 50m). 50m to 500m from activity: zone of measurable SSC increase and measurable, but lesser, thickness of redeposition. Will primarily comprise sands released or resuspended higher in the water column and resettling whilst being advected by ambient tidal currents. Thickness of redeposited sediment will be greater closer to the site of disturbance, within the tidal excursion buffer (e.g. 63mm at 100m; 25mm at 250m; 13mm at 500m). 500m to the edge of the tidal excursion buffer: zone of lesser, but measurable, SSC increase and no measurable thickness of redeposition. Will primarily comprise fine sediments maintained in suspension for more than one tidal cycle and are advected by ambient tidal currents. Increased SSC will be rapidly dispersed to ambient values within 24 hours of cessation of disturbance. Thickness of redeposited fine sediment is unlikely to be measurable. - Beyond the tidal excursion buffer: zone where increased SSC will be very low and not measurable. Redeposition of sediment will be extremely limited and not measurable. The potential for interaction of sediment plumes from different activities occurring simultaneously is low. Seabed preparation activities are expected to occur prior to cable installation activities and seabed preparation activities are unlikely to occur simultaneously with other seabed preparation activities nor construction activities with other construction activities. The magnitude of indirect impacts would be reduced by embedded mitigation. The establishment and adherence to AEZs and TAEZs (CoT64) throughout the construction phase, and consideration of these in line with the zones of effect and tidal axis, will reduce the potential for greater adverse magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each known asset, which would consider the results of the SSC assessment and reduce the magnitude of impact to levels unlikely to result in damage/loss. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Further embedded mitigation provide for the involvement of an archaeologist during the planning of any future surveys/activities (CoT64), to ensure that requirements for marine and intertidal are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks. New and improved understanding of this receptor	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Therefore, it is considered that the whole project magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential in English and Scottish waters, during the construction phase, is considered to be negligible.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is high and the whole project magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential is negligible . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.	
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction and O&M phases.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as negligible in both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.27: MHPGC Project CEA for indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Known archaeological sites and geophysical anomalies of high or medium archaeological potential consist of known wrecks, or possible wrecks/wreck related material which could carry the same value as known wrecks. This value, derived in part from the cohesion of archaeological material and its primary context, could be diminished by adverse indirect impacts, which could result in permanent and irreversible damage or loss (or both) of this receptor or parts thereof. This receptor has no capacity to accommodate or recover from such impacts. The sensitivity of the receptor is therefore considered to be high.
Magnitude of impact	Temporal overlap of construction activities of the scoped-in projects within 500m of the MHPGC Project activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings. Cumulative indirect impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, through compression of associated remains beneath redeposited sediments, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material. Conversely, the deposition of sediments atop known archaeological sites or geophysical anomalies of high or medium archaeological potential may result in a beneficial significance of effect, whereby the increased cover contributes to the preservation of archaeological material. <u>Tier 1</u> The zoning of effect is scalable for identifying the potential for indirect effects, each short-listed project has been reviewed against this to determine the potential for cumulative indirect effects and those beyond 500m have been scoped out. Tier 1 projects scoped in are: • Morven North;

	Cumulative Effects Assessment
	• Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. Spatial overlap of construction activities of these projects with the MHPGC Project construction activities presents pathways for whole project cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. The magnitude of indirect impacts would be reduced by embedded mitigation. The establishment and adherence to AEZs and TAEZs (CoT64) throughout the construction phase, and consideration of these in line with the zones of effect and tidal axis, will reduce the potential for greater adverse magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential. A bespoke and appropriately sized buffer will be implemented for each known asset, which would consider the results of the SSC assessment and reduce the magnitude of impact to levels unlikely to result in damage/loss. Further embedded mitigation provide for the involvement of an archaeologist during the planning of any future surveys/activities (CoT64), to ensure that requirements for marine and intertidal archaeology are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks. New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. It is anticipated that the short-listed Tier 1 projects with the potential for cumulative indirect impacts have similar embedded mitigation measures to reduce the potential for indirect impacts to this receptor. Therefore, it is considered that the cumulative magnitude of indirect impacts to known archaeological sites and geophysical anomalies of high or medium archaeological potential with Tier 1 projects and plans, during the construction phase, is considered to be negligible in both English and Scottish waters.

Cumulative Effects Assessment	
	<u>Tier 2</u> The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of construction and/or O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. The magnitude of impacts will be reduced by the same mitigation measures outlined for Tier 1 projects and plans. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as negligible within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase. Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. The magnitude of impacts will be reduced by the same mitigation measures outlined for Tier 1 projects and plans. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as negligible within both English and Scottish waters.
Significance of effect	The magnitude of the cumulative impact is deemed to be negligible , and the sensitivity of the receptor is high . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.

Cumulative Effects Assessment	
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction and O&M phases.
Magnitude of impact	Negligible in both English and Scottish waters, as per construction and O&M phases.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction and O&M phases.
Further mitigation and residual effect	No additional mitigation is proposed for known archaeological sites and geophysical anomalies of high or medium archaeological potential. Therefore, the residual effect on known archaeological sites and geophysical anomalies of high or medium archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.4 Direct impacts geophysical anomalies of low archaeological potential

- 9.10.4.1 There is potential for cumulative direct impacts to geophysical anomalies of low archaeological potential as a result of activities associated with the MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 9.10.4.2 The summary of the whole project assessment for 'Direct impacts to geophysical anomalies of low archaeological potential' is presented in **Table 9.28** and the summary of the Cumulative Effects Assessment is presented in **Table 9.29**.

Table 9.28: MHPGC Project whole project assessment for direct impacts to geophysical anomalies of low archaeological potential

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Whilst geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin, they are unlikely to be of high archaeological significance (such as elements of wreck or cargo). Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value. Comprising material of limited or no archaeological significance, this receptor has limited capacity to accommodate or recover from direct impacts. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters. However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation would be applied, in accordance with the Outline Offshore WSI (CoT64).	
Magnitude of impact	Construction activities also have the potential to directly impact geophysical anomalies of low archaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.25). Direct impacts from construction activities could result in permanent and irreversible damage or loss of this receptor or parts thereof, thus diminishing their evidential and historical value, which is derived in part from the cohesion of archaeological material (equivalent to a maximum high magnitude of impact). Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor as outline blow. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological potential (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Therefore, it is considered that the whole project magnitude of direct impacts to geophysical anomalies of low archaeological potential in English and Scottish waters, during the construction phase, is considered to be low.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is medium and the whole project magnitude of direct impacts to geophysical anomalies of low archaeological potential is low . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction phase.	
	However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied, in accordance with the Outline Offshore WSI (CoT64).	
Magnitude of impact	The impact pathways to this receptor are the same as those for construction activities and the same embedded mitigation measures will be applicable (CoT63 and CoT64). The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. The magnitude of impact assessment is therefore summarised as low for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction and O&M phases. However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied, in accordance with the Outline Offshore WSI (CoT64).	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as low for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.29: Project CEA for direct impacts to geophysical anomalies of low archaeological potential

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Whilst geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin, they are unlikely to be of high archaeological significance (such as elements of wreck or cargo). Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value. Comprising material of limited or no archaeological significance, this receptor has limited capacity to accommodate or recover from direct impacts. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters. However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied, in accordance with the Outline Offshore WSI (CoT64).
Magnitude of impact	Spatial or temporal overlap of construction activities of the scoped-in projects with the MHPGC Project activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative direct impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. <u>Tier 1</u> Tier 1 projects scoped into the assessment are: • Morven North; • Morven South;

	Cumulative Effects Assessment
	• NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHPGC Project. Spatial overlap of construction or O&M activities of these projects with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to geophysical anomalies of low archaeological potential. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints. Cumulative direct impacts from the MHPGC Project and Tier 1 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological potential (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the cumulative magnitude of direct impacts to geophysical anomalies of low archaeological potential in English and Scottish waters, with Tier 1 projects and plans, during the construction phase, is considered to be low. <u>Tier 2</u>

	Cumulative Effects Assessment
	The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to geophysical anomalies of low archaeological potential. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological potential (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as low within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase. Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative direct impacts to occur to geophysical anomalies of low archaeological potential. Cumulative direct impacts from MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor.

Cumulative Effects Assessment	
	Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from geophysical anomalies of low archaeological potential (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the cumulative magnitude of direct impacts to geophysical anomalies of low archaeological potential in English and Scottish waters, with Tier 1 projects and plans, during the construction phase, is considered to be low. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as low within both English and Scottish waters.
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be low , and the sensitivity of the receptor is medium . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase. However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied, in accordance with the Outline Offshore WSI (CoT64).

	Cumulative Effects Assessment
Magnitude of impact	The impact pathways to this receptor are the same as those for construction activities and the same embedded mitigation measures will be applicable (CoT63 and CoT64). The magnitude of impact assessment is therefore summarised as low for both English and Scottish waters.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction and O&M phases.
Magnitude of impact	Medium in both English and Scottish waters, as per construction and O&M phases.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction and O&M phases.
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.5 Indirect impacts geophysical anomalies of low archaeological potential

- 9.10.5.1 Indirect impacts have been scoped into the CEA for marine and intertidal archaeology for all short-listed projects, due to the presence of potential pathways. This shortlist was created based on the 9km ZoI (the maximum tidal range by which SSCs could be transported).
- 9.10.5.2 Indirect impacts may result from changes to SSC and changes to sediment transport pathways. The two zones of effect most likely to have the potential to results in indirect impacts are 0m to 50m and 50m to 500m, along the tidal axis (see **Volume 2, Chapter 1: Physical Processes, of the PEIR**). The potential for indirect impacts to marine and intertidal archaeology receptors beyond 500m from the site of disturbance is negligible (see above, **Paragraphs 9.8.2.16 and 9.8.2.19**), allowing further refinement of the shortlisted projects.
- 9.10.5.3 The summary of the whole project assessment for 'Indirect impacts to geophysical anomalies of low archaeological potential' is presented in **Table 9.30** and the summary of the Cumulative Effects Assessment is presented in **Table 9.31**.

Table 9.30: Project whole project assessment for indirect impacts to geophysical anomalies of low archaeological potential

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Whilst geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin, they are unlikely to be of high archaeological significance (such as elements of wreck or cargo). Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value. Comprising material of limited or no archaeological significance, this receptor has limited capacity to accommodate or recover from indirect impacts. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters. However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied, in accordance with the Outline Offshore WSI (CoT64).	
Magnitude of impact	Construction activities also have the potential to indirectly impact geophysical anomalies of low archaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.26). Indirect impacts may cause similar damage or loss, resulting in similar changes to these values, however, the likely nature of this receptor suggests a greater capacity to resist potential indirect impacts. Likely comprising material of limited to no archaeological significance, this receptor has limited capacity to accommodate or recover from such impacts. The magnitude of indirect impacts would be reduced by embedded mitigation. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but further embedded mitigation provide for the involvement of an archaeologist during the planning of any future surveys/activities, to ensure that requirements for marine and intertidal are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks (CoT64). New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.'	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in indirect impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the whole project magnitude of indirect impacts to geophysical anomalies of low archaeological potential in English and Scottish waters, during the construction phase, is considered to be low.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is medium and the whole project magnitude of indirect impacts to geophysical anomalies of low archaeological potential is low . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as low in both English and Scottish waters.	
Significance of effect	Low (not significant) in both English and Scottish water, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as low in both English and Scottish waters.	
Significance of effect	Minor (not significant) in both English and Scottish water, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.31: Project CEA for indirect impacts to geophysical anomalies of low archaeological potential

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Whilst geophysical anomalies of low archaeological potential have been identified as likely anthropogenic in origin, they are unlikely to be of high archaeological significance (such as elements of wreck or cargo). Such assets have a limited potential to contribute to regional research objectives and would likely be considered of low overall value. Comprising material of limited or no archaeological significance, this receptor has limited capacity to accommodate or recover from indirect impacts. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters. However, should further information, such as the results of future survey, result in a re-classification of an individual anomaly (such as it being found to represent an element of wreck), appropriate embedded mitigation measures would be applied, in accordance with the Outline Offshore WSI (CoT64).
Magnitude of impact	Temporal overlap of construction activities of the scoped-in projects within 500m of the MHPGC Project activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings. Cumulative indirect impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, through compression of associated remains beneath redeposited sediments, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material. Conversely, the deposition of sediments atop known archaeological sites or geophysical anomalies of high or medium archaeological potential may result in a beneficial significance of effect, whereby the increased cover contributes to the preservation of archaeological material. <u>Tier 1</u> The zoning of effect is scalable for identifying the potential for indirect effects, each short-listed project has been reviewed against this to determine the potential for cumulative indirect effects and those beyond 500m have been scoped out. Tier 1 projects scoped in are:

	Cumulative Effects Assessment
	• Morven North; • Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. Spatial overlap of construction activities of these projects with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to geophysical anomalies of low archaeological potential. The magnitude of indirect impacts would be reduced by embedded mitigation. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but further embedded mitigation provides for the involvement of an archaeologist during the planning of any future surveys/activities, to ensure that requirements for marine and intertidal are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks (CoT64). New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. It is anticipated that the short-listed Tier 1 projects with the potential for cumulative indirect impacts have similar embedded mitigation measures to reduce the potential for indirect impacts to this receptor. Therefore, it is considered that the cumulative magnitude of indirect impacts to geophysical anomalies of low archaeological potential with Tier 1 projects and plans, during the construction phase, is considered to be low in both English and Scottish waters. <u>Tier 2</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of construction and/or O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to geophysical anomalies of low archaeological potential.

Cumulative Effects Assessment	
	The magnitude of impacts will be reduced by the same mitigation measures outlined for Tier 1 projects and plans. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as low within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase. Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative indirect impacts to occur to geophysical anomalies of low archaeological potential. The magnitude of impacts will be reduced by the same mitigation measures outlined for Tier 1 projects and plans. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as low within both English and Scottish waters.
Significance of effect	The magnitude of the cumulative impact is deemed to be low , and the sensitivity of the receptor is medium . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as low in both English and Scottish waters.
Significance of effect	Minor in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	

	Cumulative Effects Assessment
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction and O&M phases.
Magnitude of impact	Medium in both English and Scottish waters, as per construction and O&M phases.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction and O&M phases.
Further mitigation and residual significance	No additional mitigation is proposed for geophysical anomalies of low archaeological potential. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.6 Direct impacts to magnetic anomalies

- 9.10.6.1 There is potential for cumulative direct impacts to magnetic anomalies as a result of activities associated with MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.

The summary of the whole project assessment for 'Direct impacts to magnetic anomalies' is presented in **Table 9.32** and the summary of the Cumulative Effects Assessment is presented in **Table 9.33**.

Table 9.32: MHPGC Project whole project assessment for direct impacts to magnetic anomalies

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment; however, they may represent wreck, wreck material or other entities of archaeological significance. No magnetic anomalies were identified which, with the current data, have been deemed likely to represent wrecks associated with other supporting evidence, however, the overall uncertain nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. The assessment provided is based upon a consideration of the low likelihood of high value remains, and the likely moderate to negligible value of this receptor. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities also have the potential to directly impact magnetic anomalies. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.25). Direct impacts from construction activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, thus diminishing any intrinsic, contextual or associative held (equivalent to a maximum high magnitude of impact). Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the cumulative magnitude of direct impacts to magnetic anomalies in English and Scottish waters, during the construction phase, is considered to be low .	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is medium and the whole project magnitude of direct impacts to magnetic anomalies is low . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on geophysical anomalies of low archaeological potential, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction phase.	
Magnitude of impact	The impact pathways to this receptor are the same as those for construction activities and the same embedded mitigation measures will be applicable (CoT63 and CoT64). The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. The magnitude of impact assessment is therefore summarised as low for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction and O&M phases.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as low for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.33: MHPGC Project CEA for direct impacts to magnetic anomalies

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment; however, they may represent wreck, wreck material or other entities of archaeological significance. No magnetic anomalies were identified which, with the current data, have been deemed likely to represent wrecks associated with other supporting evidence, however, the overall uncertain nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. The assessment provided is based upon a consideration of the low likelihood of high value remains, and the likely moderate to negligible value of this receptor. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters.
Magnitude of impact	Spatial or temporal overlap of construction activities of the scoped-in projects with the MHPGC Project activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings;

	Cumulative Effects Assessment
	• UXO low order clearance. Cumulative direct impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. <u>Tier 1</u> Tier 1 projects scoped into the assessment are: • Morven North; • Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHPGC Project. Spatial overlap of construction or O&M activities of these projects with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to magnetic anomalies. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints. Cumulative direct impacts from the MHPGC Project and Tier 1 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities."

	Cumulative Effects Assessment
	The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the cumulative magnitude of direct impacts to magnetic anomalies in English and Scottish waters, with Tier 1 projects and plans, during the construction phase, is considered to be low. <u>Tier 2</u> The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to magnetic anomalies. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as low within both English and Scottish waters. <u>Tier 3</u>

Cumulative Effects Assessment	
	Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative direct impacts to occur to magnetic anomalies. Cumulative direct impacts from MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but other embedded mitigation measures would also reduce the magnitude of impact on this receptor. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed. UXO surveys typically target such anomalies and archaeological review of the survey results may enable other embedded mitigation to be implemented to reduce impacts to any identified archaeological remains (CoT64). A PAD would also be adhered to during the construction phase, outlining the method of reporting and preserving chance discoveries of archaeological remains through various construction activities, which may derive from magnetic anomalies (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the cumulative magnitude of direct impacts to magnetic anomalies in English and Scottish waters, with Tier 1 projects and plans, during the construction phase, is considered to be low. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as low within both English and Scottish waters.
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be low , and the sensitivity of the receptor is medium . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	

	Cumulative Effects Assessment
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	The impact pathways to this receptor are the same as those for construction activities and the same embedded mitigation measures will be applicable (CoT63 and CoT64). The magnitude of impact assessment is therefore summarised as low for both English and Scottish waters.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	Low in both English and Scottish waters, as per construction phase.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.7 Indirect impacts to magnetic anomalies

- 9.10.7.1 Indirect impacts have been scoped into the CEA for marine and intertidal archaeology for all short-listed projects, due to the presence of potential pathways. This shortlist was created based on the 9km ZoI (the maximum tidal range by which SSCs could be transported).
- 9.10.7.2 Indirect impacts may result from changes to SSC and changes to sediment transport pathways. The two zones of effect most likely to have the potential to result in indirect impacts are 0m to 50m and 50m to 500m, along the tidal axis (see **Volume 2, Chapter 1: Physical Processes, of the PEIR**). The potential for indirect impacts to marine and intertidal archaeology receptors beyond 500m from the site of disturbance is negligible (see above, **Paragraphs 9.8.2.16 and 9.8.2.19**), allowing further refinement of the shortlisted projects.
- 9.10.7.3 The summary of the whole project assessment for 'Indirect impacts to magnetic anomalies' is presented in **Table 9.34** and the summary of the Cumulative Effects Assessment is presented in **Table 9.35**.

Table 9.34: MHPGC Project whole project assessment for indirect impacts to magnetic anomalies

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment; however, they may represent wreck, wreck material or other entities of archaeological significance. No magnetic anomalies were identified which, with the current data, have been deemed likely to represent wrecks associated with other supporting evidence, however, the overall uncertain nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. The assessment provided is based upon a consideration of the low likelihood of high value remains, and the likely moderate to negligible value of this receptor. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.26). Indirect impacts from construction activities could result in the same permanent and irreversible damage or loss of this receptor or parts thereof as direct impacts, thus diminishing any intrinsic, contextual or associative held (equivalent to a maximum high magnitude of impact). The magnitude of indirect impacts would be reduced by embedded mitigation. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but further embedded mitigation provides for the involvement of an archaeologist during the planning of future surveys/activities, to ensure that requirements for marine and intertidal are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks (CoT64). New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Whilst the application of embedded mitigation would result in indirect impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. Therefore, it is considered that the whole project magnitude of indirect impacts to magnetic anomalies in English and Scottish waters, during the construction phase, is considered to be low .	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is medium and the whole project magnitude of indirect impacts to magnetic anomalies is low . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as low in both English and Scottish waters.	
Significance of effect	Minor (not significant) in both English and Scottish water, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as low in both English and Scottish waters.	
Significance of effect	Minor (not significant) in both English and Scottish water, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.35: MHPGC Project CEA for indirect impacts to magnetic anomalies

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Magnetic anomalies are likely anthropogenic in origin but may alternatively be geological. These typically represent discarded marine/fishing equipment; however, they may represent wreck, wreck material or other entities of archaeological significance. No magnetic anomalies were identified which, with the current data, have been deemed likely to represent wrecks associated with other supporting evidence, however, the overall uncertain nature and value of the receptor presents difficulty in determining its capacity to accommodate impacts and therefore its sensitivity. The assessment provided is based upon a consideration of the low likelihood of high value remains, and the likely moderate to negligible value of this receptor. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters.
Magnitude of impact	Temporal overlap of construction activities of the scoped-in projects within 500m of the MHPGC Project activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative indirect impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, through compression of associated remains beneath redeposited sediments, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material. Conversely, the deposition of sediments atop known archaeological sites or geophysical anomalies of high or medium archaeological potential may result in a beneficial significance of effect, whereby the increased cover contributes to the preservation of archaeological material. <u>Tier 1</u> The zoning of effect is scalable for identifying the potential for indirect effects, each short-listed project has been reviewed against this to determine the potential for cumulative indirect effects and those beyond 500m have been scoped out. Tier 1 projects scoped in are:

	Cumulative Effects Assessment
	• Morven North; • Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. Spatial overlap of construction activities of these projects with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to magnetic anomalies. The magnitude of indirect impacts would be reduced by embedded mitigation. Embedded mitigation of the impacts to this receptor could, but may not necessarily, require the establishment of AEZs or TEZs, but further embedded mitigation provides for the involvement of an archaeologist during the planning of future surveys/activities, to ensure that requirements for marine and intertidal are upheld and specifications can consider the collection of additional data to improve understanding of identified anomalies and wrecks (CoT64). New and improved understanding of this receptor may be used to establish new AEZs and/or alter existing AEZs (through discussion with stakeholders) to minimise potential for impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Whilst the application of embedded mitigation would result in direct impacts being reduced, some degree of loss cannot be wholly excluded. However, the intrinsic values of this receptor would be largely preserved. It is anticipated that the short-listed Tier 1 projects with the potential for cumulative indirect impacts have similar embedded mitigation measures to reduce the potential for indirect impacts to this receptor. Therefore, it is considered that the cumulative magnitude of indirect impacts to magnetic anomalies with Tier 1 projects and plans, during the construction phase, is considered to be low in both English and Scottish waters. <u>Tier 2</u> The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of construction and/or O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to magnetic anomalies.

Cumulative Effects Assessment	
	The magnitude of impacts will be reduced by the same mitigation measures outlined for Tier 1 projects and plans. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as low within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase. Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative indirect impacts to occur to magnetic anomalies. The magnitude of impacts will be reduced by the same mitigation measures outlined for Tier 1 projects and plans. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as low within both English and Scottish waters.
Significance of effect	The magnitude of the cumulative impact is deemed to be low , and the sensitivity of the receptor is medium . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as low in both English and Scottish waters.
Significance of effect	Minor in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.

	Cumulative Effects Assessment
Magnitude of impact	Low in both English and Scottish waters, as per construction phase.
Significance of effect	Minor in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for magnetic anomalies. Therefore, the residual effect on magnetic anomalies, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.8 Direct impacts to unknown archaeological sites and remains

- 9.10.8.1 There is potential for cumulative direct impacts to unknown archaeological sites and remains as a result of activities associated with MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 9.10.8.2 The summary of the whole project assessment for 'Unknown archaeological sites and remains' is presented in **Table 9.36** and the summary of the Cumulative Effects Assessment is presented in **Table 9.37**.

Table 9.36: MHPGC Project whole project assessment for direct impacts to unknown archaeological sites and remains

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Unknown archaeological sites and remains have the potential to be of the highest value, such as wrecks, <i>in situ</i> prehistoric sites or aircraft remains. Such assets have no capacity to accommodate or recover from direct impacts. The sensitivity of this receptor is therefore summarised as high . This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities also have the potential to directly impact unknown archaeological sites and remains of low archaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.25). Direct impacts from construction activities could result in the permanent and irreversible damage and/or loss of this receptor or parts thereof, thus diminishing any value held (equivalent to a maximum high magnitude of impact). Embedded mitigation has been integrated into the MHPGC Project to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. Whilst embedded mitigation measures will reduce the magnitude of direct impacts to unknown archaeological remains, some degree of damage/loss cannot be wholly excluded. The process of discovery itself is likely to result in some degree of impact which may result in the MDS, that being irreparable damage or loss of the receptor. Although discovery of new archaeological remains within the MHPGC Project PEIR Red Line Boundary may in itself result in impacts, any subsequent potential impacts will be mitigated. Appropriate preservation and the potential for new discoveries to contribute to research frameworks and objectives would result in a beneficial (positive) outcome. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. It is therefore considered that the maximum high adverse magnitude of effect on discovery would be balanced by a maximum high beneficial magnitude, thereafter, resulting in an overall negligible magnitude in both English and Scottish waters during the construction phase.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is high and the whole project magnitude of direct impacts to unknown archaeological sites and remains negligible . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction and O&M phases.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as negligible.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.37: MHPGC Project CEA for direct impacts to unknown archaeological sites and remains

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Unknown archaeological sites and remains have the potential to be of the highest value, such as wrecks, <i>in situ</i> prehistoric sites or aircraft remains. Such assets have no capacity to accommodate or recover from direct impacts. The sensitivity of the receptor is therefore considered to be high. This is applicable to both English and Scottish waters.
Magnitude of impact	Spatial or temporal overlap of construction activities of the scoped-in projects with the MHPGC Project activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative direct impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. <u>Tier 1</u> Tier 1 projects scoped into the assessment are: • Morven North; • Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2.

	Cumulative Effects Assessment
	There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHPGC Project. Spatial overlap of construction or O&M activities of these projects with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to unknown archaeological sites and remains. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints. Cumulative direct impacts from the MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation has been integrated into the Projects to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. Whilst embedded mitigation measures will reduce the magnitude of direct impacts to unknown archaeological remains, some degree of damage/loss cannot be wholly excluded. The process of discovery itself is likely to result in some degree of impact which may result in the MDS, that being irreparable damage or loss of the receptor. Although discovery of new archaeological remains within the MHPGC Project PEIR Red Line Boundary may in itself result in impacts, any subsequent potential impacts will be mitigated. Appropriate preservation and the potential for new discoveries to contribute to research frameworks and objectives would result in a beneficial (positive) outcome. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Therefore, within both English and Scottish waters, it is considered that the maximum high adverse magnitude of effect on discovery would be balanced by a maximum high beneficial magnitude, and therefore that the whole project magnitude of direct impacts to unknown archaeological sites and remains with Tier 1 projects and plans is considered to be negligible.

Cumulative Effects Assessment	
	<u>Tier 2</u> The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative direct impacts to occur to unknown archaeological sites and remains. Embedded mitigation has been integrated into the Projects to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. Whilst embedded mitigation measures will reduce the magnitude of direct impacts to unknown archaeological remains, some degree of damage/loss cannot be wholly excluded. The process of discovery itself is likely to result in some degree of impact which may result in the MDS, that being irreparable damage or loss of the receptor. Although discovery of new archaeological remains within the MHPGC Project PEIR Red Line Boundary may in itself result in impacts, any subsequent potential impacts will be mitigated. Appropriate preservation and the potential for new discoveries to contribute to research frameworks and objectives would result in a beneficial (positive) outcome. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as negligible within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase.

	Cumulative Effects Assessment
	Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Cumulative direct impacts from MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation has been integrated into the MHPGC Project to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. Whilst embedded mitigation measures will reduce the magnitude of direct impacts to unknown archaeological remains, some degree of damage/loss cannot be wholly excluded. The process of discovery itself is likely to result in some degree of impact which may result in the MDS, that being irreparable damage or loss of the receptor. Although discovery of new archaeological remains within the MHPGC Project PEIR Red Line Boundary may in itself result in impacts, any subsequent potential impacts will be mitigated. Appropriate preservation and the potential for new discoveries to contribute to research frameworks and objectives would result in a beneficial (positive) outcome. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as negligible within both English and Scottish waters.

Cumulative Effects Assessment	
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be negligible , and the sensitivity of the receptor is high . The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.
Magnitude of impact	Negligible in both English and Scottish waters, as per construction phase.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.9 Indirect impacts to unknown archaeological sites and remains

- 9.10.9.1 Indirect impacts have been scoped into the CEA for marine and intertidal archaeology for all short-listed projects, due to the presence of potential pathways. This shortlist was created based on the 9km Zol (the maximum tidal range by which SSCs could be transported).
- 9.10.9.2 Indirect impacts may result from changes to SSC and changes to sediment transport pathways. The two zones of effect most likely to have the potential to results in indirect impacts are 0m to 50m and 50m to 500m, along the tidal axis (see **Volume 2, Chapter 1: Physical Processes, of the PEIR**). The potential for indirect impacts to marine and intertidal archaeology receptors beyond 500m from the site of disturbance is negligible (see above, **Paragraphs 9.8.2.16 and 9.8.2.19**), allowing further refinement of the shortlisted projects.
- 9.10.9.3 The summary of the whole project assessment for 'Indirect impacts to unknown archaeological sites and remains' is presented in **Table 9.38** and the summary of the Cumulative Effects Assessment is presented in **Table 9.39**.

Table 9.38: MHPGC Project whole project assessment for indirect impacts to unknown archaeological sites and remains

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Unknown archaeological sites and remains have the potential to be of the highest value, such as wrecks, <i>in situ</i> prehistoric sites or aircraft remains. Such assets have no capacity to accommodate or recover from indirect impacts. The sensitivity of this receptor is therefore summarised as high . This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities also have the potential to indirectly impact unknown archaeological sites and remains. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.26). Indirect impacts from construction activities could result in the same permanent and irreversible damage or loss of this receptor or parts thereof as direct impacts, thus diminishing any intrinsic, contextual or associative held (equivalent to a maximum high magnitude of impact). Embedded mitigation has been integrated into the MHPGC Project to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. The application of the embedded mitigation methods will result in any indirect impacts to unknown archaeological sites and remains being reduced, however, some degree of loss cannot be wholly excluded and the process of discovery itself is likely to result in some degree of impact which may equate to the MDS, which would be irreversible damage or loss. However, the same consideration for the comparable beneficial and adverse impacts on this receptor, as outlined for direct impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. It is therefore considered that the maximum high adverse magnitude of effect on discovery would be balanced by a maximum high beneficial magnitude, thereafter, resulting in an overall negligible magnitude in both English and Scottish waters during the construction phase.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is high and the whole project magnitude of indirect impacts to unknown archaeological sites and remains negligible . Therefore, the effect in both English and Scottish waters will be of minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the construction phase, is considered to be minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible for both English and Scottish waters.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the O&M phase, is considered to be minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	High for both English and Scottish waters, as per construction and O&M phases.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as negligible.	
Significance of effect	Minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.	

Table 9.39: MHPGC Project CEA for indirect impacts to unknown archaeological sites and remains those of the MHPGC Project

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Unknown archaeological sites and remains have the potential to be of the highest value, such as wrecks, <i>in situ</i> prehistoric sites or aircraft remains. Such assets have no capacity to accommodate or recover from indirect impacts. The sensitivity of the receptor is therefore considered to be high. This is applicable to both English and Scottish waters.
Magnitude of impact	Temporal overlap of construction activities of the scoped-in projects within 500m of the MHPGC Project activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative indirect impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, through compression of associated remains beneath redeposited sediments, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material. Conversely, the deposition of sediments atop known archaeological sites or geophysical anomalies of high or medium archaeological potential may result in a beneficial significance of effect, whereby the increased cover contributes to the preservation of archaeological material. <u>Tier 1</u> The zoning of effect is scalable for identifying the potential for indirect effects, each short-listed project has been reviewed against this to determine the potential for cumulative indirect effects and those beyond 500m have been scoped out. Tier 1 projects scoped in are: • Morven North; • Morven South; • NO-UK Telecom Cable;

	Cumulative Effects Assessment
	• Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHPGC Project. Spatial overlap of construction or O&M activities of these projects with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to unknown archaeological sites and remains. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints. Cumulative indirect impacts from the MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation has been integrated into the MHPGC Project to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. The application of the embedded mitigation methods will result in any indirect impacts to unknown archaeological sites and remains being reduced, however, some degree of loss cannot be wholly excluded and the process of discovery itself is likely to result in some degree of impact which may equate to the MDS, which would be irreversible damage or loss. However, the same consideration for the comparable beneficial and adverse impacts on this receptor, as outlined for direct impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority.

	Cumulative Effects Assessment
	Therefore, within both English and Scottish waters, it is considered that the maximum high adverse magnitude of effect on discovery would be balanced by a maximum high beneficial magnitude, and therefore that the cumulative magnitude of indirect impacts to unknown archaeological sites and remains with Tier 1 projects and plans is considered to be negligible. <u>Tier 2</u> The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to unknown archaeological sites and remains. Embedded mitigation has been integrated into the Projects to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. The application of the embedded mitigation methods will result in any indirect impacts to unknown archaeological sites and remains being reduced, however, some degree of loss cannot be wholly excluded and the process of discovery itself is likely to result in some degree of impact which may equate to the MDS, which would be irreversible damage or loss. However, the same consideration for the comparable beneficial and adverse impacts on this receptor, as outlined for direct impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as negligible within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase.

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	Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Cumulative direct impacts from the MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Embedded mitigation has been integrated into the MHPGC Project to minimise the significance of effect on unknown archaeological remains. AEZs around identified wrecks and geophysical anomalies of high and medium archaeological potential would also offer protection to unknown artefacts and sites therein (associated with the AEZ target or otherwise) (CoT64). Adherence to the PAD during the construction phase would raise the awareness of others engaged in construction activities which have the potential to encounter unknown archaeological remains (CoT64). Archaeological involvement in further surveys may allow greater understanding of this receptor to be developed (CoT64). UXO, geophysical and geotechnical surveys have the potential to accumulate data which, when reviewed by a competent archaeologist, may indicate hitherto unknown sites of archaeological potential. Any such discoveries may then trigger other embedded mitigation, as appropriate. The application of the embedded mitigation methods will result in any indirect impacts to unknown archaeological sites and remains being reduced, however, some degree of loss cannot be wholly excluded and the process of discovery itself is likely to result in some degree of impact which may equate to the MDS, which would be irreversible damage or loss. However, the same consideration for the comparable beneficial and adverse impacts on this receptor, as outlined for direct impacts. The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as negligible within both English and Scottish waters.
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptor is high. The cumulative effect in both English and Scottish waters will therefore be of minor significance, which is not significant in EIA terms.

Cumulative Effects Assessment	
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the construction phase, is considered to be minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the O&M phase, is considered to be minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	High in both English and Scottish waters, as per construction phase.
Magnitude of impact	Negligible in both English and Scottish waters, as per construction phase.
Significance of effect	Minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for unknown archaeological sites and remains. Therefore, the residual effect on unknown archaeological sites and remains, during the decommissioning phase, is considered to be minor , which is not significant in EIA terms.

9.10.10 Direct impacts to sub-seabed deposits with geoarchaeological potential

- 9.10.10.1 There is potential for cumulative direct impacts to sub-seabed deposits of geoarchaeological potential as a result of activities associated with the MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 9.10.10.2 The summary of the whole project assessment for 'Direct impacts to sub-seabed deposits of geoarchaeological potential' is presented in **Table 9.40** and the summary of the Cumulative Effects Assessment is presented in **Table 9.41**.

Table 9.40: MHPGC Project whole project assessment for direct impacts to sub-seabed deposits of geoarchaeological potential

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Geoarchaeological remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of geoarchaeological remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint (of the MHPGC Project's' MDS) suggest that the receptor has some capacity to accommodate direct impacts, would be unlikely to experience a significant degree of loss or damage. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities also have the potential to directly impact sub-seabed deposits of geoarchaeological deposits. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.25). Archaeological involvement in the planning of future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPGC Project (CoT64). Full details of mitigation will be presented within an Outline Offshore WSI and PAD, which will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers (CoT63). Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. Therefore, it is considered that the whole project magnitude of direct impacts to sub-seabed deposits of geoarchaeological potential in English and Scottish waters, during the construction phase, is considered to be negligible.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is medium and the whole project magnitude of direct impacts to sub-seabed deposits of geoarchaeological potential is negligible. Therefore, the effect in both English and Scottish waters will be of negligible or minor significance during the construction phase, which is not significant in EIA terms.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the construction phase, is considered to be negligible or minor , which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of direct impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible for both English and Scottish waters.	
Significance of effect	Negligible or minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the O&M phase, is considered to be negligible or minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction and O&M phases.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience direct the same impacts as per the O&M phase. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as negligible.	
Significance of effect	Negligible or minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the decommissioning phase, is considered to be negligible or minor , which is not significant in EIA terms.	

Table 9.41: MHPGC Project CEA for direct impacts to sub-seabed deposits of geoarchaeological potential

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Geoarchaeological remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of geoarchaeological remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint (of the MHPGC Project's' MDS) suggest that the receptor has some capacity to accommodate direct impacts, would be unlikely to experience a significant degree of loss or damage. The sensitivity of the receptor is therefore considered to be medium. This is applicable to both English and Scottish waters.
Magnitude of impact	Spatial or temporal overlap of construction activities of the scoped-in projects with the MHPGC Project activities presents pathways for cumulative direct impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative direct impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. <u>Tier 1</u> Tier 1 projects scoped into the assessment are: • Morven North; • Morven South; • NO-UK Telecom Cable;

	Cumulative Effects Assessment
	• Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHGPC Project. Spatial overlap of construction or O&M activities of these projects with the MHGPC Project construction activities presents pathways for cumulative direct impacts to occur to sub-seabed deposits of geoarchaeological potential. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints. Cumulative direct impacts from the MHGPC Project and Tier 1 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Archaeological involvement in the planning of future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPCG Project (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. Therefore, within both English and Scottish waters, it is considered that the cumulative magnitude of direct impacts to sub-seabed deposits of geoarchaeological potential with Tier 1 projects and plans is considered to be negligible. <u>Tier 2</u> The construction phase of the MHGPC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHGPC Project construction activities presents pathways for cumulative direct impacts to occur to sub-seabed deposits of geoarchaeological potential.

	Cumulative Effects Assessment
	Archaeological involvement in the planning of future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPGC Project (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. Eastern Green Link 4 has committed to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as negligible within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase. Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative direct impacts to occur to sub-seabed deposits of geoarchaeological potential. Cumulative direct impacts from MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired.

Cumulative Effects Assessment	
	It is also anticipated that Tier 3 projects will commit to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as negligible within both English and Scottish waters.
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be negligible , and the sensitivity of the receptor is medium . The cumulative effect in both English and Scottish waters will therefore be of negligible or minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the construction phase, is considered to be negligible or minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any direct impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Direct impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.
Significance of effect	Negligible or minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the O&M phase, is considered to be negligible or minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	Negligible in both English and Scottish waters, as per construction phase.
Significance of effect	Negligible or minor (not significant) in both English and Scottish waters, as per construction phase.

	Cumulative Effects Assessment
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the decommissioning phase, is considered to be negligible or minor , which is not significant in EIA terms.

9.10.11 Indirect impacts to sub-seabed deposits of geoarchaeological potential

- 9.10.11.1 Indirect impacts have been scoped into the CEA for marine and intertidal archaeology for all short-listed projects, due to the presence of potential pathways. This shortlist was created based on the 9km ZoI (the maximum tidal range by which SSCs could be transported).
- 9.10.11.2 Indirect impacts may result from changes to SSC and changes to sediment transport pathways. The two zones of effect most likely to have the potential to result in indirect impacts are 0m to 50m and 50m to 500m, along the tidal axis (see **Volume 2, Chapter 1: Physical Processes, of the PEIR**). The potential for indirect impacts to marine and intertidal archaeology receptors beyond 500m from the site of disturbance is negligible (see above, **Paragraphs 9.8.2.16 and 9.8.2.19**), allowing further refinement of the shortlisted projects.
- 9.10.11.3 The summary of the whole project assessment for 'Indirect impacts to sub-seabed deposits of geoarchaeological potential' is presented in **Table 9.42** and the summary of the Cumulative Effects Assessment is presented in **Table 9.43**.

Table 9.42: MHPGC Project whole project assessment for indirect impacts to sub-seabed deposits of geoarchaeological potential

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Sensitivity of receptor	Geoarchaeological remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of geoarchaeological remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint (of the MHPGC Project's' MDS) suggest that the receptor has some capacity to accommodate indirect impacts, would be unlikely to experience a significant degree of loss or damage. The sensitivity of this receptor is therefore summarised as medium. This applies to both English and Scottish waters.	
Magnitude of impact	Construction activities also have the potential to indirectly sub-seabed deposits of geoarchaeological potential. Construction activities, their distribution and impact pathways would be the same for this receptor as for known archaeological sites and geophysical anomalies of high and medium archaeological potential (Table 9.26). Archaeological involvement in the planning of future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPGC Project (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high-level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Therefore, it is considered that the whole project magnitude of indirect impacts to sub-seabed deposits of geoarchaeological potential in English and Scottish waters, during the construction phase, is considered to be negligible.	
Significance of effect	Overall, within both English and Scottish waters, it is considered that the receptor sensitivity is medium and the whole project magnitude of indirect impacts to sub-seabed deposits of geoarchaeological potential is negligible. Therefore, the effect in both English and Scottish waters will be of negligible or minor significance during the construction phase, which is not significant in EIA terms.	
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the construction phase, is considered to be negligible or minor, which is not significant in EIA terms.	
Operations and maintenance phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction phase.	
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible for both English and Scottish waters.	
Significance of effect	Negligible or minor (not significant) for both English and Scottish waters, as per construction phase.	
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the O&M phase, is considered to be negligible or minor , which is not significant in EIA terms.	
Decommissioning phase		
Sensitivity of receptor	Medium for both English and Scottish waters, as per construction and O&M phases.	
Magnitude of impact	Decommissioning is likely to operate within the parameters identified for construction. The impact of the MHPGC Project plus Morven North or Morven South is not considered likely to cumulatively raise the impact magnitude rating concluded in the MHPGC Project alone assessment.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	Although assets may have been identified prior to or during preceding phases, further assets may remain undetected. Where decommissioning activities extend beyond the footprint of previous works, undetected assets may experience the same impacts as per the O&M phase. However, the same embedded mitigation measures will be applicable (CoT63 and CoT64) and therefore the magnitude of impact assessment remains the same as that for construction, summarised as negligible.	
Significance of effect	Negligible or minor (not significant) for both English and Scottish waters, as per construction and O&M phases.	
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the decommissioning phase, is considered to be negligible or minor , which is not significant in EIA terms.	

Table 9.43: MHPGC Project CEA for indirect impacts to sub-seabed deposits of geoarchaeological potential

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Sensitivity of receptor	Geoarchaeological remains derive their significance from intrinsic and contextual value, for their potential to inform understanding of environmental conditions during the formation of parent geological units. The extent of geoarchaeological remains may be determined by the extent and characteristics of the parent unit and may therefore be widespread across a substantial area. The combination of a possible widespread resource and relatively limited footprint (of the MHPGC Project's' MDS) suggest that the receptor has some capacity to accommodate indirect impacts, would be unlikely to experience a significant degree of loss or damage. The sensitivity of the receptor is therefore considered to be medium. This is applicable to both English and Scottish waters.
Magnitude of impact	Temporal overlap of construction activities of the scoped-in projects within 500m of the MHPGC Project activities presents pathways for cumulative indirect impacts to occur to known archaeological sites and geophysical anomalies of high or medium archaeological potential. Construction activities, including seabed preparation, of the MHPGC Project may comprise: • Sandwave clearance; • Cable installation (trenching); • Trenchless techniques (at landfall); • Vessel interactions; • Cable protection; • Cable crossings; • UXO low order clearance. Cumulative indirect impacts from MHPGC Project and other project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, through compression of associated remains beneath redeposited sediments, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material. Conversely, the deposition of sediments atop known archaeological sites or geophysical anomalies of high or medium archaeological potential may result in a beneficial significance of effect, whereby the increased cover contributes to the preservation of archaeological material. <u>Tier 1</u> The zoning of effect is scalable for identifying the potential for indirect effects, each short-listed project has been reviewed against this to determine the potential for cumulative indirect effects and those beyond 500m have been scoped out. Tier 1 projects scoped in are:

	Cumulative Effects Assessment
	• Morven North; • Morven South; • NO-UK Telecom Cable; • Havhingsten Seg 2 Telecom Cable; • North Sea Link North Power Cable; • Eastern Green Link 2. There is a temporal overlap with the construction and O&M phases of Tier 1 cable and offshore energy project boundaries with those of the MHPGC Project. Spatial overlap of construction or O&M activities of these projects with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to sub-seabed deposits of geoarchaeological potential. Construction phases will have greater potential for impacts than either O&M or decommissioning phases, as activities are likely to occur predominantly within the construction footprints. Cumulative direct impacts from the MHPGC Project and Tier 1 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Archaeological involvement in the planning of future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPGC Project (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an "Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities." The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. Therefore, within both English and Scottish waters, it is considered that the cumulative magnitude of indirect impacts to sub-seabed deposits of geoarchaeological potential with Tier 1 projects and plans is considered to be negligible.

Cumulative Effects Assessment	
	<u>Tier 2</u> The construction phase of the MHPGC Project will experience a temporal overlap with the Tier 2 project Eastern Green Link 4. Spatial overlap of O&M activities of this project with the MHPGC Project construction activities presents pathways for cumulative indirect impacts to occur to sub-seabed deposits of geoarchaeological potential. Archaeological involvement in the planning of future surveys and archaeological review of acquired data is included as embedded mitigation of the MHPGC Project (CoT64). The Applicant has made a commitment (CoT63 of Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR) that an 'Outline Offshore Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will set out the archaeological mitigation measures and high level methodologies for continued archaeological involvement in the projects Scopes of Work (SoW) prior to construction. Methodologies will be expanded through the submission of detailed Method Statements to the Archaeological Curator. The Outline Offshore WSI and PAD will be revised to a Full Offshore WSI and PAD at the post-consent stage, to align archaeological mitigation measures and methodologies with consented activities.' The Outline Offshore WSI and PAD will be submitted at ES stage as part of the application for development consent and marine licence applications to Scottish Ministers. The detailed Method Statements will be developed substantially in accordance with the Outline Offshore WSI and PAD, and as approved by the discharging authority. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. Eastern Green Link 4 has committed to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor. The Tier 2 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as negligible within both English and Scottish waters. <u>Tier 3</u> The construction phase of the MHPGC Project could experience a temporal overlap with the Tier 3 MBAGC Project. It is currently unknown what phase this project will be in during the MHPGC Project's construction phase. Spatial overlap of construction and/or O&M activities of this Tier 3 project with the MHPGC Project's construction activities presents pathways for cumulative indirect impacts to occur to sub-seabed deposits of geoarchaeological potential. Cumulative direct impacts from MHPGC Project and Tier 3 project activities could result in the permanent and irreversible damage or loss of this receptor or parts thereof, or dispersal of associated remains/material, thus diminishing their cultural value which is derived in part from the cohesion of archaeological material and its primary context. Such activities would be undertaken prior to the commencement of construction activities and the results used to improve understanding of the palaeoenvironmental potential of geological deposits and possible impacts. Undertaking ground truthing

Cumulative Effects Assessment	
	activities (boreholes and VCs) would introduce a small impact to this receptor, however, this would be offset by the knowledge gained from analysis of any sample and other results. Such knowledge may contribute to regional, national and international research objectives. The limited impact from further surveys is therefore weighed against the potential benefits of the data acquired. It is also anticipated that Tier 3 projects will commit to a similar suite of mitigation measures to reduce the potential for project-related impacts to occur to this receptor. The Tier 3 projects and plans are not considered to raise the magnitude of impact beyond what is assessed for Tier 2, summarised as negligible within both English and Scottish waters.
Significance of effect	In both English and Scottish waters, the magnitude of the cumulative impact is deemed to be negligible , and the sensitivity of the receptor is medium . The cumulative effect in both English and Scottish waters will therefore be of negligible or minor significance, which is not significant in EIA terms.
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the construction phase, is considered to be negligible or minor , which is not significant in EIA terms.
Operations and maintenance phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	The extent of any indirect impacts during operation would be less than that of the construction phase. Where operation and maintenance impacts occur within the footprint of construction impacts, it is likely that no greater impact will be experienced than has previously occurred. Indirect impacts arising from operation activities therefore concern where these activities interact with areas of the seabed not previously impacted during the construction phase. The magnitude of indirect impacts would be experienced on a scale, influenced by the duration and proximity of the causal activity. However, the magnitude of impact assessment remains the same as that for construction activities, summarised as negligible in both English and Scottish waters.
Significance of effect	Negligible or minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the O&M phase, is considered to be negligible or minor , which is not significant in EIA terms.
Decommissioning phase	
Sensitivity of receptor	Medium in both English and Scottish waters, as per construction phase.
Magnitude of impact	Negligible in both English and Scottish waters, as per construction phase.

	Cumulative Effects Assessment
Significance of effect	Negligible or minor (not significant) in both English and Scottish waters, as per construction phase.
Further mitigation and residual significance	No additional mitigation is proposed for sub-seabed deposits of geoarchaeological potential. Therefore, the residual effect on sub-seabed deposits of geoarchaeological potential, during the decommissioning phase, is considered to be negligible or minor , which is not significant in EIA terms.

9.10.12 Proposed monitoring

- 9.10.12.1 Site specific monitoring is not proposed because the assessment concluded that MHPGC Project would not give rise to significant effects for marine and intertidal archaeology, either alone or when considered cumulatively with other plans, projects or activities.

9.11 Transboundary effects

- 9.11.1.1 A screening of transboundary impacts has been carried out. Any potential for significant transboundary effects with regard to marine and intertidal archaeology from the construction, O&M and decommissioning phases of the MHPGC Project upon interests of other states has been assessed as part of the PEIR within **Volume 1, Annex 4.3: Transboundary Screening, of the PEIR**.
- 9.11.1.2 There are no identified pathways through which either direct or indirect impacts could result in significant transboundary effects on the marine and intertidal archaeology of an EEA state. Details will be updated as appropriate within the ES.

9.12 Inter-related effects

- 9.12.1.1 Inter-related effects are the combined impact of multiple aspects of the MHPGC Project on a single receptor. These are as follows:
- **Project lifetime effects:** Assessment of the scope for effects that occur throughout more than one phase of the MHPGC Project (construction, O&M and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases.
 - **Receptor led effects:** Assessment of the scope for all effects (including inter-relationships between environmental topics) to interact, spatially and temporally, to create inter-related effects on a receptor.
- 9.12.1.2 Inter-related effects are assessed within **Volume 4, Chapter 5: Inter-related Effects, of the PEIR**.

9.13 Summary

9.13.1 Summary of effects

- 9.13.1.1 This chapter has assessed the potential impacts on marine and intertidal archaeology from the construction, O&M and decommissioning phases of the MHPGC Project. **Table 9.44** presents a summary of potential impacts on marine and intertidal archaeology receptors and confirms residual effects. These impacts are the same for English and Scottish waters, and so are presented within the same table.

9.13.2 Summary of secondary mitigation and monitoring

- 9.13.2.1 No additional mitigation or monitoring is proposed at this stage of the MHPGC Project further to the embedded commitments provided in **Table 9.20** as no significant residual effects have been identified.

Table 9.44: Summary of potential impacts and residual effects

Impact	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
Construction phase					
Direct impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential	High	Negligible	Minor; not significant	None	Minor; not significant
Indirect impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential	High	Negligible	Minor; not significant	None	Minor; not significant
Direct impacts to geophysical anomalies of low archaeological potential	Medium	Low	Minor; not significant	None	Minor; not significant
Indirect impacts to geophysical anomalies of low archaeological potential	Medium	Low	Minor; not significant	None	Minor; not significant
Direct impacts to magnetic anomalies	Medium	Low	Minor; not significant	None	Minor; not significant
Indirect impacts to magnetic anomalies	Medium	Low	Minor; not significant	None	Minor; not significant
Direct impacts to unknown archaeological sites and remains	High	Negligible	Minor; not significant	None	Minor; not significant

Impact	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
Indirect impacts to unknown archaeological sites and remains	High	Negligible	Minor; not significant	None	Minor; not significant
Direct impacts to sub-seabed deposits of geoarchaeological interest	Medium	Negligible	Negligible or minor; not significant	None	Negligible or minor; not significant
Indirect impacts to sub-seabed deposits of geoarchaeological interest	Medium	Negligible	Negligible or minor; not significant	None	Negligible or minor; not significant
O&M Phase					
Direct impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential	High	Negligible	Minor; not significant	None	Minor; not significant
Indirect impacts to known archaeological sites and geophysical anomalies of high and medium archaeological potential	High	Negligible	Minor; not significant	None	Minor; not significant
Direct impacts to geophysical anomalies of low archaeological potential	Medium	Low	Minor; not significant	None	Minor; not significant

Impact	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
Indirect impacts to geophysical anomalies of low archaeological potential	Medium	Low	Minor; not significant	None	Minor; not significant
Direct impacts to magnetic anomalies	Medium	Low	Minor; not significant	None	Minor; not significant
Indirect impacts to magnetic anomalies	Medium	Low	Minor; not significant	None	Minor; not significant
Direct impacts to unknown archaeological sites and remains	High	Negligible	Minor; not significant	None	Minor; not significant
Indirect impacts to unknown archaeological sites and remains	High	Negligible	Minor; not significant	None	Minor; not significant
Direct impacts to sub-seabed deposits of geoarchaeological interest	Medium	Negligible	Negligible or minor; not significant	None	Negligible or minor; not significant
Indirect impacts to sub-seabed deposits of geoarchaeological interest	Medium	Negligible	Negligible or minor; not significant	None	Negligible or minor; not significant
Decommissioning phase					
It is anticipated that the effect of all impacts will be the same as those for the construction and O&M phases.					

9.14 References

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