Port of Mostyn

Mostyn Energy Park Extension

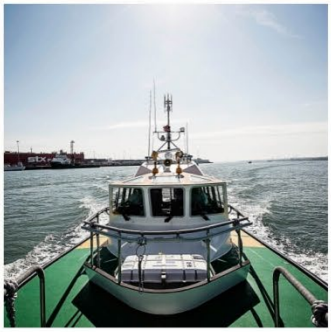
Environmental Statement

Chapter 12: Cultural Heritage and Marine Archaeology

December 2022







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	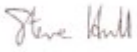	

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Notice

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12.1 Introduction

This chapter provides an assessment of the potential significant effects of the MEPE Project on cultural heritage and marine archaeology up to Mean High Water Springs (MHWS). This chapter has been prepared by Wessex Archaeology.

The following receptors have been taken forward as part of the assessment:

- Seabed prehistory (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g. handaxes);
- Seabed features, including maritime sites (such as shipwrecks and associated material including cargo, obstructions and fishermen's fasteners) and aviation sites (aircraft crash sites and associated debris); and
- Intertidal heritage assets.

Potential impacts on the setting of designated historic assets from the proposed development were scoped out due to the large distance between them. This was agreed in the scoping responses from the archaeological curators (see Table 12.4). Similarly, effects on landside heritage assets during construction and operation have been scoped out, given that the landside works are non-intrusive and located at a substantial distance from the nearest landside heritage asset (see Table 12.4). Impacts from the disposal of dredged material have been scoped out as this activity will take place at already licenced marine disposal sites that have been characterised for this purpose.

This chapter is supported by the Marine Archaeology Desk Based Assessment (DBA), which is included in Appendix 12.1 of this ES.

Potential effects on cultural and marine heritage receptors have been assessed with reference to the Physical Processes assessment (Chapter 6).

12.1.1 Data gaps and limitations

Data used to compile this chapter comprises secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this appraisal. The assumption is made that the secondary data, as well as that derived from other secondary sources, are reasonably accurate.

The records held by the United Kingdom Hydrographic Office (UKHO), Cadw, National Monuments Record of Wales, Clwyd-Powys Archaeological Trust Historic Environment Record and the other sources used in this assessment are not a record of all surviving cultural heritage assets, rather a record of the discovery of a wide range of archaeological and historical components of the marine historic environment. For example, data from the UKHO is skewed towards the 19th and 20th century wrecks and therefore does not include all assets. The information held within these data sources is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown. In particular, this relates to buried archaeological features.

12.2 Definition of study area

The study area for this assessment is the area over which potential direct and indirect effects of the MEPE Project are predicted to occur during the construction and operational periods.

Direct effects could occur to known and potential archaeology receptors during the construction period as a result of the proposed piling and capital dredge activities.

Indirect effects could occur to known and potential archaeology receptors due to changes in physical processes as a result of the proposed piling and capital dredge activities.

The study area for cultural heritage and marine archaeology therefore comprises the proposed development area of the MEPE Project up to MHWS. This encompasses all direct impacts from construction and dredging activities. A wider search area consisting of the Dee Estuary was used for obtaining records from relevant archive databases. This broader search area allows for a greater understanding of the wider archaeological baseline environment and captures relevant proximate heritage receptors in the assessment that could be affected indirectly.

12.3 Impact assessment methodology

12.3.1 Data and information sources

Current baseline conditions have been determined by a desk-based review of available information.

The main desk-based sources of information that have been reviewed to inform the current baseline description within the vicinity of the proposed development include:

- UKHO wreck database (acquired April 2022);
- National Heritage List maintained by Cadw comprising data of designated heritage assets including sites protected under the PMRA 1986 and the PWA 1973 (acquired April 2022);
- National Monuments Record of Wales (NMRW) maintained by Coflein and derived from information by Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), comprising data for terrestrial and marine archaeological sites, find spots and archaeological events (acquired May 2022);
- Lle Geo-Portal;
- Historic Environment Record(s) (HER) from Clwyd-Powys Archaeological Trust (CPAT) (acquired April 2022);
- Admiralty Charts, historic maps and Ordnance Survey maps;
- Relevant primary and secondary sources in Wessex Archaeology's own library and those available through the Archaeology Data Service and other websites; and
- Welsh Research Frameworks.

12.3.2 Determining significance of effects

To facilitate the impact assessment process and ensure consistency in the terminology of significance, a standard assessment methodology has been applied. This methodology has been developed from a range of sources, including:

- Cadw, *Caring for Coastal Heritage* (1999);
- Cadw, *Conservation Principles for the sustainable management of the historic environment in Wales* (2011); and
- Cadw, *Managing the Marine Historic Environment of Wales* (2020).

12.3.3 Receptor sensitivity

In order to assess the potential impacts of a development upon marine cultural heritage, the conceptual approach known as the 'source-pathway-receptor' model has been adopted. This approach is based on the identification of the source (i.e., the origin of a potential impact), the pathway (i.e., the means by which the effect of the activity could impact a receptor) and the receptor that may be impacted (e.g., known/potential heritage receptors). For the significance of any given impact to be fully understood and for appropriate mitigation to be proposed as necessary, the sensitivity of any marine heritage receptors that may be impacted need to be considered. This section outlines how the sensitivity of marine heritage receptors has been ascertained.

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

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

Cultural heritage and marine archaeology receptors cannot typically adapt, tolerate, or recover from physical impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each receptor is predominantly quantified only by its value. In cases where site-specific baseline data is not available, a precautionary approach is typically adopted and potential receptors are considered to have a high sensitivity.

12.3.4 Value of a receptor

Based on Cadw, *Conservation Principles for the sustainable management of the historic environment in Wales* (2011), the significance of an historic receptor "embraces all the diverse cultural heritage values that people associate with it, or which prompt them to respond to it" (p.10).

Within this chapter, significance is weighed by consideration of the potential for the asset to demonstrate the following value criteria:

- Evidential value - deriving from the potential of a place to yield evidence about past human activity;
- Historical value - deriving from 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 - deriving from the ways in which people draw sensory and intellectual stimulation from a place; and
- Communal value - deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values but tend to have additional and specific aspects.

With regards to appraising the value of shipwrecks, the following criteria listed in English Heritage's *Ships and Boats: Prehistory to Present - Designation Selection Guide* (English Heritage (now Historic England), 2012) can be used to assess an asset in terms of its value:

- Period;
- Rarity;
- Documentation;
- Group value;
- Survival/condition; and
- Potential.

These aspects help to characterise each asset whilst also comparing them to other similar assets. The criteria also enable the potential to contribute to knowledge, understanding and outreach to be assessed.

The value of known archaeological and cultural heritage assets were assessed on a four-point scale using professional judgement informed by criteria provided in Table 12.1.

Table 12.1. Criteria to assess the archaeological value of marine receptors

Value	Definition
High	Best known, only example or above average example and / or significant or high potential to contribute to knowledge and understanding and / or outreach. Receptors with a demonstrable international or national dimension to their importance are likely to fall within this category: ▪ Wrecked ships and aircraft that are protected under the Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979 or Protection of Military Remains Act 1986 with an international dimension to their importance, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value; and ▪ Known submerged prehistoric sites and landscapes with the confirmed presence of largely *in situ* artefactual material or palaeogeographic features with demonstrable potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.
Medium	Average example and / or moderate potential to contribute to knowledge and understanding and / or community engagement: ▪ Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival, and investigation; and ▪ Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
Low	Below average example and / or low potential to contribute to knowledge and understanding and / or community engagement: ▪ Includes wrecks of ships and aircraft that do not have statutory protection or equivalent significance, and have low potential based on a formal assessment of their importance in terms of build, use, loss, survival, and investigation; and ▪ Prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment.
Negligible	Poor example and / or little or no potential to contribute to knowledge and understanding and / or community engagement. Receptor with little or no surviving archaeological interest.

12.3.5 Impact magnitude

The magnitude of an impact or scale of change is defined by a series of factors including the spatial extent of any interaction, the likelihood, duration, frequency, and reversibility of a potential impact. The definitions of the levels of magnitude used in this assessment are described in Table 12.2 and are based on professional judgement, founded on experience and the application of relevant guidance and legislation.

Table 12.2. Classification of magnitude of impact

Magnitude	Definition
High	Complete or comprehensive physical damage or changes to the character of the receptor.
Medium	Considerable changes that affect the character of the receptor, resulting in considerable physical damage.
Low	Minor change that partially affects the character of the receptor, resulting in some physical damage.
Negligible	Very minor or negligible change to the character of the receptor, with no or negligible physical damage leading to an imperceptible change to the baseline.

12.3.6 Significance criteria

The significance of effect has been assessed by comparing the value or sensitivity of the receptor against the magnitude of impact. Residual effects (i.e. those remaining after mitigation measures) have been taken into consideration and have been assessed. The overall significance has been assessed using the significance matrix shown in Table 12.3. Effects of Major or Moderate adverse significance are considered 'significant' in this assessment.

Table 12.3. Significance matrix

Value / Sensitivity	Magnitude/Scale of Change			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	Insignificant
Medium	Moderate	Moderate / Minor	Minor/ Insignificant	Insignificant
Low	Minor	Minor / Insignificant	Insignificant	Insignificant
Negligible	Insignificant	Insignificant	Insignificant	Insignificant

12.4 Consultation

Consultation with regard to the outcomes of the formal scoping process and whether there are any likely effects of the MEPE Project on cultural heritage and marine archaeology has been undertaken as appropriate, with NRW, Cadw, RCAHMW and CPAT.

The consultation that has been undertaken, along with the outcome of such consultation and how it has influenced this assessment is provided in Table 12.4.

Table 12.4 Summary of consultation to date

Consultee	Reference, Date	Summary of Response	How Comments have Been Addressed in this Chapter
NRW, Cadw	Scoping Opinion, 06 January 2022	Cadw agree that any impact on the setting of the designated historic assets is likely to be similar to the visual impact, given the distance between them and that the impact of the proposed development on the setting of designated historic assets can be scoped out of the EIA.	Potential impacts on the setting of designated historic assets from the proposed development has been scoped out of the EIA (Section 12.1).
NRW, Cadw	Scoping Opinion, 06 January 2022	Cadw disagree that effects on landside heritage assets during construction and operation can be scoped out of the assessment as the proposed works are located in an area which, as noted on page 65 of the scoping report, has a potential for prehistoric archaeology to be present.	Seabed prehistory is not scoped out of this assessment (Section 12.1 and 12.7). However, landside heritage has been scoped out as the proposed non-intrusive landside development will have minimal impact on any known terrestrial archaeology given that the nearest landside heritage assets is located 400 m from the proposed development. This is supported by the scoping consultation response that was received from CPAT (see below).
CPAT	Scoping consultation response, 14 October 2021	Consultation responses from CPAT agreed with the suggested scope for terrestrial cultural heritage and the effects on cultural heritage setting during construction and operation to be scoped out.	Noted.
NRW, Cadw	Scoping Opinion, 06 January 2022	Cadw would also recommend the inclusion of a visual inspection of the study area and where possible a walkover survey of any areas that are not covered by water, to inform the assessment.	Wessex Archaeology has considered the recommendation of a walkover survey. However, areas at risk of impact including the reclamation area, potential relocation of RoRo dolphins and capital/maintenance dredge areas, are generally under water and rarely or not at all accessible for a walkover survey and/or comprise unstable habitats that are not safe to access (e.g. soft/fluid mud).

Consultee	Reference, Date	Summary of Response	How Comments have Been Addressed in this Chapter
NRW, RCAHMW	Scoping Opinion, 06 January 2022	Consideration of potential for historic assets, both shipwrecks and crashed aircraft, with a currently unknown location should be scoped into the assessment. The assessment area for documented shipwreck/aircraft losses with the potential to be 'discovered' should be extended to the whole Dee Estuary (as for the UKHO data), rather than a 500 m buffer around the development.	The wider Dee Estuary has been considered to undertake a search of receptors with a currently unknown location (see Sections 12.2 and 12.6).
NRW, Cadw	Scoping Opinion, 06 January 2022	The assessment should include reference to a 'Protocol for Archaeological Discoveries' (PAD) as part of the coverage of cultural heritage.	Noted. Reference has been made to a PAD (see Section 12.8).
NRW, Cadw	Scoping Opinion, 06 January 2022	Recommendation to use the HER maintained by CPAT, on behalf of the Welsh Ministers under their duties required by the Historic Environment (Wales) Act 2016.	Noted. This recommended data source has been used to support this assessment (see Section 12.3.1).

12.5 Implications of legislation, policy and guidance

This section of the chapter sets out key aspects and implications of policy and guidance that are relevant to the assessment of likely impacts on cultural heritage and marine archaeology. It builds upon the overarching chapter covering Legislation, Policy and Guidance (Chapter 4).

12.5.1 Legislation

Introduction

Cadw is responsible for the archaeological resource within Wales' territorial waters, from MHW to the 12 nautical miles (nm) limit, while the main source of information on underwater heritage in Wales is the marine database of the National Monument Record compiled by the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW). NRW is responsible for licencing, regulating and planning marine activities in the seas around Wales to ensure they are carried out in a sustainable way.

The Historic Environment (Wales) Act 2016 is the fundamental statutory framework for the protection and management of the Welsh historic environment, along with the Ancient Monuments and Archaeological Areas Act 1970, the Planning Act 1990 and the Protection of Wrecks Act 1973.

The Welsh National Marine Plan identifies opportunities for the sustainable development of Wales' seas (Welsh Government 2019) by guiding new development and related decisions both inshore and offshore. Development plans and the Marine Plan should work together and support integrated decision making and collaboration across marine and terrestrial interfaces and boundaries (Welsh Government, 2021b).

Marine legislation

The proposed development is located in Welsh territorial waters (up to 12 nm from the coast). The following legislation applies:

- **Protection of Wrecks Act (PWA) 1973**: Section One and Two: It is an offence to carry out certain activities in a defined area surrounding a wreck that has been designated, unless a licence for those activities has been obtained from the Government. There are no protected wrecks within the footprint of the proposed development;
- **Ancient Monuments and Archaeological Areas Act (AMAA)1979 (as amended)**: It is a criminal offence to carry out any works on, or near to, a Scheduled Monument without Scheduled Monument Consent. Both terrestrial and maritime sites, including wrecks, may be designated under this Act. There are no scheduled ancient monuments within the footprint of the proposed development;
- **Protection of Military Remains Act (PMRA) 1986**: This Act provides protection for the wreckage of military aircraft and designated military vessels. The Act provides for two types of protection: 'protected places' and 'controlled sites'. Military aircraft are automatically protected, although vessels have to be specifically designated. The primary reason for designation is to protect as a 'war grave' the last resting place of servicemen; however, the Act does not require the loss of the vessel to have occurred during the war. There are no protected places or controlled sites within the footprint of the proposed development; and
- **Merchant Shipping Act (MSA) 1995**: All wreck material recovered from UK waters must be declared to the Receiver of Wreck who acts to settle questions of ownership and salvage. 'Wreck' refers to all items of flotsam, jetsam, derelict, and lagan found in or on the shores of the sea or any tidal water.

12.5.2 National policy

National Policy Statement for Ports (NPSfP)

The NPSfP recognises the importance of the historic environment and that the construction, operation and decommissioning of port infrastructure has the potential to result in adverse impacts on it (Department for Transport, 2012; Section 5.12). Therefore, the significance of heritage assets and the extent of the impact of the proposed development on the significance of any heritage assets has to be understood (Department for Transport, 2012; Section 5.12.9). Both designated heritage assets and undesignated heritage assets have to be considered, and the setting of a heritage asset also has to be taken into account.

The NPSfP advises that the ES should include:

- A description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance;
- Appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation;
- Consideration of the possibility of damage to buried features from underwater disposal of dredged material; and
- An assessment of the extent of the impact of the proposed development on the significance of any heritage assets affected (Department for Transport 2012, Section 5.12).

The NPSfP also advises that the assessment should take account of other relevant UK policies and plans, including the Marine Policy Statement (MPS) and any existing marine plans provided for by the MCAA 2009 (Department for Transport, 2012; Section 4.1.1).

Future Wales - The National Plan 2040

Future Wales – The National Plan 2040 (2021a) sets out the national development framework. It provides a development plan with a strategy for addressing key national priorities through the planning system. It recognises that landscape and heritage are key motivators for people to visit Wales.

Marine Policy

The Marine and Coastal Access Act (MCAA) 2009 received Royal Assent on 12 November 2009. It introduced new planning and management systems for overseeing the marine environment, most notably through the requirement to obtain marine licences for works at sea (including the deposition or removal of any substance or object from the sea below MHWS). It created a strategic marine planning system that seeks to promote the efficient, sustainable use and protection of the marine environment, guided by the Marine Policy Statement and a series of Marine Plans.

Welsh National Marine Plan (WNMP)

The WNMP (Welsh Government, 2019) is the first marine plan for Wales and is intended to guide the sustainable development of the marine area by setting out how proposals will be considered by decision makers.

There are two policies in the WNMP that specifically relates to cultural heritage and marine archaeology:

- **SOC_04: Welsh language and culture** – proposals that contribute to the promotion and facilitation of the use of the Welsh language and culture are encouraged. This policy seeks to ensure that all developers consider their impact on Welsh Culture, including heritage and the historic environment; and
- **SOC_05: Historic assets** – proposals should demonstrate how potential impacts on historic assets and their setting have been taken into consideration and should, in order of preference:
  - Avoid adverse impacts on historic assets and their settings; and/or
  - Minimise impacts where they cannot be avoided; and/or
  - Mitigate impacts where they cannot be minimised.
  - If significant adverse impacts cannot be avoided, minimised or mitigated proposals must present a clear and convincing case for proceeding.

12.5.3 Local policy

Planning Policy Wales (PPW)

PPW (Welsh Government, 2021b) sets out the land use planning policies of the Welsh Government. It describes the planning system as managing the use of land in the public interest, and states that the system "*must reconcile the needs of development and conservation […] and protecting, promoting, conserving and enhancing the built and historic environment*". The importance of the historic environment in Welsh planning policy is interwoven throughout the document.

The section on *Distinctive & Natural Places* states that "*The historic environment is a finite, non-renewable and shared resource and a vital and integral part of the historical and cultural identity of Wales […] The historic environment can only be maintained as a resource for future generations if the individual historic assets are protected and conserved.*"

The Welsh Government's specific objectives for the historic environment include conserving archaeological remains, both for their own sake and for their role in education, leisure and the economy.

The PPW notes that the conservation and enhancement of historic assets is most effective when considered at the earliest stage of plan preparation or when designing new proposals.

It also states that 'any decisions made through the planning system must fully consider the impact on the historic environment and on the significance and heritage values of individual historic assets and their contribution to the character of place.'

Flintshire County Council Unitary Development Plan 2000 – 2015

The FUDP was the adopted development plan for the 15-year period between 2000 to 2015. The council is currently embarking on the preparation of a Local Development Plan for the County for a 15-year period between 2015 to 2030. The FUDP provided a framework for making rational and consistent decisions on planning applications and to guide development to appropriate locations. It also included policies which sought to protect and enhance the natural and built environment. Chapter 9 Historic Environment policy objective consisted of preserving, understanding, enhancing, sustainable use and regeneration of the built environment. The target was to "*minimise loss or damage through development, to designated sites, historic landscapes and buildings of international, national or county heritage importance and ensure adequate recording before any change occurs*".

12.5.4 Guidance

This assessment was carried out in a manner consistent with available guidance as described below:

- *Caring for Coastal Heritage* (Cadw, 1999);
- *Caring for Military Sites of the Twentieth Century* (Cadw, 2009);
- *Conservation Principles for the Sustainable Management of the Historic Environment in Wales* (Cadw, 2011);
- *Managing the Marine Historic Environment of Wales* (Cadw, 2020);
- *The Code of Practice for Seabed Development* (Joint Nautical Archaeology Policy Committee and The Crown Estate, 2006);
- *Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy* (Oxford Archaeology, 2008);
- *Our Seas – A shared resource: High level marine objectives* (Defra, 2009);
- *Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest* (PIANC, 2014); and
- *Managing the Marine Historic Environment of Wales* (Annex B – Draft) (Natural Resources Wales in conjunction with Cadw & Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW, March 2019).

12.6 Description of the existing environment

The full baseline resource of marine archaeology and cultural heritage which includes known wrecks and obstructions, the potential for further maritime and aviation archaeological receptors, potential seabed prehistory, and intertidal heritage receptors is presented and illustrated in the Marine Archaeology DBA included in Appendix 12.1. The subsections below present a summary baseline description of the relevant cultural heritage and marine archaeology receptors.

12.6.1 Seabed prehistory

There are no known prehistoric receptors within the study area. However, features such as these have been previously identified within the vicinity of the proposed development, including the presence of Palaeolithic cave sites in North Wales. A number of studies have been undertaken within the Irish Sea that have provided an insight into the palaeogeography of the region, specifically relating to the terrestrial landscape that would have existed between the Devensian to Last Glacial Maximum (LGM) and the Holocene transgression (Bicket and Tizzard, 2015; Lynch *et al.*, 2000; Flemming 2005). There is therefore the general potential for the presence of a preserved, post-LGM palaeolandscape within the study area.

In general, on the basis of their age and rarity in a marine context, all *in situ* Palaeolithic and Mesolithic material are likely to be of high archaeological value and of national / international importance. Sites containing certain forms of Palaeolithic material are so rare in Britain that they should, whenever possible, remain undisturbed. In the event that prehistoric archaeological material is discovered *in situ* it should be considered of particularly high archaeological importance. As such, the features and deposits which have the potential to contain within them *in situ* material should be considered as high value assets.

Prehistoric archaeological material discovered within secondary contexts (e.g. redeposited sediments) also has the potential to provide valuable information on patterns of human land use and demography in a field of study which is still little understood and rapidly evolving. They are, however,

by their very nature derived and, as such, isolated prehistoric finds should be regarded as medium value assets.

Palaeoenvironmental evidence in the context of an *in situ* prehistoric site (if found) will be of high value.

Table 12.5 provides an overview of the value assigned to prehistoric cultural heritage receptors, based on criteria listed in Table 12.1.

Table 12.5. Value of prehistoric cultural heritage receptors

Receptor	Description	Value
In situ prehistoric sites	Primary context features and associated artefacts and their physical setting (if found).	High
	Known submerged prehistoric sites and landscape features with the demonstrable potential to include artefactual material.	High
Submerged landscape features (without associated archaeological material)	Other known submerged palaeolandscape features and deposits likely to date to periods of prehistoric archaeological interest with the potential to contain *in situ* material.	Medium
Isolated prehistoric finds	Isolated discoveries of prehistoric archaeological material discovered within secondary contexts.	Medium
Palaeoenvironmental evidence	Isolated examples of palaeoenvironmental material	Low
	Palaeoenvironmental material associated with specific palaeo-landscape features or archaeological material	High

12.6.2 Seabed features: Maritime

There are no sites within the study area that are subject to statutory protection from the PWA 1973, the PMRA 1986 or the AMAA Act 1979; the three principal statutes that could be used to protect marine archaeological sites (Section 12.5).

A search of records in the UKHO, RCAHMW and HER datasets revealed 23 sites, two of which are located within the boundaries of the MEPE Project, specifically the maintenance dredge area, whilst the remaining 21 sites fall within the wider Dee Estuary. Full details of these records are provided in Appendix 12.1 and illustrated in Figure 2 of the DBA.

The UKHO record 8159 (labelled '2008 'in Figure 2 of the DBA) is that of a tractor that was used as a mussel digger which became embedded in the sand bank. In 1989 this was removed, and the record amended to 'Lifted', and therefore there is possibly no wreck material remaining at this location, although some debris may remain. As the remains pertain to modern machinery and likely to have been lifted completely, this record is not being considered further for this assessment.

UKHO record 66854 (labelled '2009' in Figure 2 of the DBA) is that of the British sailing vessel *Ant*. This wooden vessel was a Mersey flat (jigger sail) built in 1863. At the time of loss, in February 1907, the vessel was owned by Clare's Lighterage Co, Lancashire, carrying roofing slate from Port Dinorwic to Sankey Bridge. The *Ant* was sheltering from a westerly force 7 gale when it collided with the Liverpool registered steamship *Jane*. The *Ant* subsequently foundered in the Wild Roads, River Dee. In 2019 the grounding position of the wreck was observed as within Mostyn Church, covered by sand and marked with a buoy. The wreck is currently buried in sand and the marker buoy withdrawn, with the position left for filing only.

This vessel belongs to a period when there were great changes being made to the way in which vessels were built and used, and although examples of vessels from this period are generally more numerous in the archaeological record, those that contribute to an understanding of these changes would be considered as having increased value. As this vessel represents an important part of Wales' slate heritage, it is believed to have a high value.

Maritime recorded losses

Recorded Losses can be considered as an indication of the potential for archaeological maritime remains to exist within the study area and the type and number of wrecks that could be present. These records relate to vessels reportedly lost or for which no physical wreck remains have ever been identified. Table 12.6 shows the distribution of these documented losses according to date of loss for those records whose position fall within the search area. Details regarding these losses are presented in Appendix 12.1.

Table 12.6 Maritime recorded losses, summary by date

Date	Number of records of ships
Post-medieval	3
19th century	30
Modern	13
Unknown	2
Total	**48**

12.6.3 Seabed features: Aviation

There are no known aircraft crash sites located within the study area. Nonetheless, there is the potential for aircraft or aircraft-related debris to exist on the seafloor. Given the identified potential of the area for military aircraft crashes (Wessex Archaeology, 2008), particularly relating to the Second World War, the likelihood would be for any aircraft crash to be of military origin, which would be protected under PMRA 1986 and therefore would be of high value. This applies to the fabric of the aircraft and applies to both complete aircraft wrecks and debris.

Aviation recorded losses

There are 11 aircraft recorded losses within the search area. As these are recorded losses the positional data is unreliable and serves only to provide an indication of the types of aircraft that flew over this coastline. Details regarding these losses are presented in Appendix 12.1.

Six of the records consist of Spitfires: Supermarine Spitfire VB BM113, I N3276, I K9981, I K9995, I R6989, and F22 PK385. The former five aircraft were lost between 1844 and 1942, and either crashed or had to force land in the Dee Estuary. The Supermarine Spitfire F22 PK385 flew into a sandbank 3 miles east of the Point of Ayr during aerobatics practice/display.

Two records consist of a Miles Master I N7944 (NPRN 515633) and a Miles Martinet I HP242 (NPRN 515822), both built by Philip & Powis, Woodley. These were lost in the early 1940s.

The remaining three recorded losses consist of a Blackburn Botha I L6237 (NPRN 515600) which ditched into the River Dee in 1943, an Avro Anson I EG186 (NPRN 515801) which ditched in the Dee Estuary in 1945 and a De Havilland Chipmunk T10 WB747 (NPRN 515684) which crashed in the Dee Estuary in 1954.

12.6.4 Intertidal archaeological receptors

There are no sites listed by the UKHO, RCAHMW and HER datasets that fall within the intertidal zone of the study area.

One site (labelled '2020', as shown in Figure 2 of the DBA) consisting of the remains of a small timber vessel now sits on the landside of the proposed development, to the north-east side of Mostyn Docks.

One modern pillbox dated to 1940 is located due west of Mostyn Docks (NPRN 270405), outside of the study area. This consists of a concrete hexagonal pillbox located midway along breakwater (NPRN 270405). There previously was another concrete hexagonal pillbox dated to 1940 on the end of the old quay (NPRN 270404) but this was damaged and demolished in 2001.

12.6.5 Future baseline

In the absence of the MEPE Project there would be no change to known and potential archaeological marine and terrestrial heritage receptors beyond those caused by natural physical processes and natural deterioration. It is understood that the site of the proposed development has been in use as a trading point since as early as the 17th century and would likely continue in use as an operational commercial port.

12.7 Impact assessment

This section identifies the potential likely effects on cultural heritage and marine archaeology receptors as a result of the construction and subsequent operation of the MEPE Project.

The following impact pathways have been assessed:

- **Construction Phase**
  - Direct impacts on known and potential marine heritage receptors from construction activities;
  - Direct impacts on known and potential marine heritage receptors from capital dredging; and
  - Indirect impacts to marine heritage receptors due to altered sediment or hydrological processes.
- **Operational Phase**
  - Direct impacts on known and potential marine heritage receptors from maintenance dredging; and
  - Indirect effects such as changes in local scouring and sedimentation patterns.

In addition, the potential risks to human health, the potential impacts on climate and the vulnerability of the proposed development to climate change, as well as to risks of major accidents and/or disasters have been considered in the context of the potential likely effects on cultural heritage and marine archaeology.

Cumulative impacts on cultural heritage and marine archaeology could arise as a result of other coastal and marine developments and activities. These have been considered as necessary as part of the cumulative impacts and in-combination effects assessment included in Chapter 13 of this ES.

12.7.1 Direct impacts on potential marine heritage receptors from construction activities

Should any direct impacts to marine archaeological receptors occur, these are most likely to take place during the construction phase of the proposed development. Impacts resulting in adverse effects upon archaeological receptors from construction works are generally those involving direct physical contact with the seabed. Marine archaeological receptors with height, such as shipwrecks, may also be impacted by activities that occur within the water column.

Construction activities that could have direct impacts will primarily consist of piling which could lead to physical damage of the underlying archaeological resource and deformation of the surrounding deposits. The use of jack up barges with piling rig(s) may be used to undertake piling of new quay wall. Alternatively, a temporary raised stone bund will be constructed behind the line of the new quay wall to provide a stable platform or pad for the crane and associated piling rig(s).

Any adverse effects upon marine archaeological receptors from direct impacts associated with construction activities would be permanent and irreversible. As such, the magnitude of direct impacts on known maritime and aviation receptors, and potential seabed prehistory receptors as a result of construction activities, if they were to occur, would be high. As a result, if appropriate mitigation is not applied, both the high sensitivity and the high magnitude of direct impacts on such resources (if present) would result in **major adverse** effects that are considered to be significant.

12.7.2 Direct impacts on potential marine heritage receptors from capital dredging

Any direct impacts to marine archaeological receptors (if present) are likely to occur during capital dredging activities. Impacts resulting in negative effects upon archaeological receptors as part of dredging works are those involving contact with the seabed and/or the removal of seabed sediments.

It is anticipated that the capital dredging will be conducted using a cutter suction dredger and trailer suction hopper dredger (TSHD). A selected proportion of the suitable dredged material is proposed to be reused as engineering fill material for the reclamation.

Any adverse effects upon marine archaeological receptors from direct impacts associated with capital dredging would be permanent and irreversible. As such, the magnitude of direct impacts on potential marine heritage receptors as part of dredging activities, if they were to occur, would be high. As a result, if appropriate mitigation is not applied, both the high sensitivity and the high magnitude of direct impacts on such resources would result in **major adverse** effects that are considered to be significant should they interact with the capital dredging activities.

12.7.3 Indirect impacts to marine heritage receptors due to altered sediment or hydrological processes

The indirect effects upon the known and potential marine heritage receptors are those which occur as a result of changes to hydrodynamic and sediment transport regimes, where these changes have occurred as a consequence of activities and structures associated with the construction and dredging activities. These impacts may occur through sediment dispersal / deposition from dredging activities or scour associated with the disturbance from construction activities and structures.

Indirect impacts may affect marine archaeological baseline conditions where they result in the increased exposure or burial of marine archaeological receptors (if present). The increased exposure of marine archaeological receptors has the potential to cause erosion and deterioration to the receptors.

Conversely, should receptors be subject to increased sedimentation and burial, they may, in turn, benefit from conditions which afford higher levels of preservation.

The magnitude of effect of indirect impacts to marine archaeology and cultural heritage during the construction phase is expected to be negligible. Results provided in the Physical Processes Chapter 6, which characterised the local hydrodynamics and wave regime within, and around the proposed dredge and disposal areas, show that the magnitude of change is assessed as low. This is because the potential sedimentation in the marine environment is likely to be the same as that which already occurs from existing maintenance dredging and disposal activity in the area.

Furthermore, the disturbance will be limited to the extent of the dredge site itself and, therefore, temporary and localised.

The high sensitivity and the negligible magnitude of indirect impacts on such resources would result in negligible effects that are assessed as i**nsignificant**.

12.7.4 Direct impacts on known and potential marine heritage receptors from maintenance dredging

Any adverse effects upon marine archaeological receptors from direct impacts associated with maintenance dredging would be permanent and irreversible. If receptors were present, the magnitude of direct impacts on known maritime and aviation receptors, and potential seabed prehistory features as part of dredging activities, would be high.

It is anticipated that the maintenance dredging will be conducted using a combination of trailer suction hopper dredger (TSHD), plough and water injection dredging (WID), as per existing dredge marine licences. This will be undertaken for the maintenance dredge of the new and existing berths, navigational channel and harbour areas.

The maintenance dredge area comprises a polygon that shows where maintenance dredging of the navigation channel may take place in response to the natural movement of the Salisbury and Mostyn channels. In reality, any dredging that is required will be limited to one main channel that is dominant at any given time and will not take place across the entire area of the polygon. This will minimise the volume of dredging that is required and, therefore, the environmental and cost implications.

However, as maintenance dredging takes place in areas that have previously been disturbed by either capital dredging and/or maintenance dredging, as well as the highly mobile nature of the Mostyn/Salisbury channels and banks, there is unlikely to be further impact. Therefore, the magnitude of direct impacts on such resource would result in negligible effects that are assessed as **insignificant**.

12.7.5 Indirect effects such as changes in local scouring and sedimentation patterns

The effects upon the known and potential marine archaeology are those which occur as a result of changes to hydrodynamic and sediment transport, where these changes have occurred as a result of the presence of structures associated with the proposed development.

The magnitude of change of indirect impacts to marine archaeological assets during operation is expected to be negligible. Following an assessment of the local hydrodynamic and sediment transport regime, review of data available from existing data provided by the Port of Mostyn from ongoing monitoring surveys and a numerical modelling (based on a realistic worst-case scenario) assessment,

Physical Processes Chapter 6 concluded that the potential impacts caused by operational activities would be small, giving a rise to an overall low exposure to change. Changes to sediment transport pathways as a result of the MEPE Project would be limited in extent to the immediate vicinity of the proposed new berth and the deepened approach channel, reducing in magnitude with distance.

The high sensitivity and the negligible magnitude of indirect impacts on such resources would result in negligible effects, that are assessed as **insignificant**.

12.7.6 Potential risks to human health

The impacts on cultural heritage and marine archaeological receptors that will result from the construction and operation of the MEPE Project are such that they are not anticipated to cause a potential risk to human health.

12.7.7 Potential impacts on climate and vulnerability of proposed development to climate change

The impacts on cultural heritage and marine archaeological receptors that will result from the construction and operation of the MEPE Project are such that they are not anticipated to cause a consequent effect on climate or change the vulnerability of the proposed development to climate change.

12.7.8 Risks of major accidents and/or disasters

The impacts on cultural heritage and marine archaeological receptors that will result from the construction and operation of the MEPE Project are such that they are not anticipated to cause any risk of a major accident and/or disaster occurring.

12.8 Mitigation and residual impacts

12.8.1 Secondary mitigation

Secondary mitigation measures (as defined in the Impact Assessment Approach Chapter 5) will alter the risk of exposure and, hence, will require significance to be re-assessed and thus the residual impact (i.e. with mitigation) identified.

Mitigation measures are to be secured through a Written Scheme of Investigation (WSI). The final WSI will need to take account of any relevant matters emerging through the ongoing detailed design process and any relevant matters emerging through the examination of the application.

The following measures are designed to mitigate any predicted adverse effects upon seabed receptors from direct impacts. The mitigation measures are designed to either avoid, reduce or offset any damage/disturbance occurring as a result of the proposed development upon known receptors, and to establish the presence of unknown sites. These measures will be further developed if required through ongoing consultation with statutory authorities as part of the marine licence application review period.

Direct impacts on potential marine heritage receptors from construction activities, dredging and maintenance dredging

Archaeological Exclusion Zones (AEZs)

The primary mitigation for the protection of known archaeological receptors is avoidance. This is commonly achieved through the implementation and monitoring of Archaeological Exclusion Zones (AEZs), which are proposed for identified high value seabed receptors of anthropogenic origin.

PIANC guidance document no. 124 *Dredging and Port Construction: interactions with features of archaeological or heritage interest* (2014) sets out the context for initiating AEZs or safety zones to facilitate the avoidance of sensitive heritage assets. The mitigation will establish appropriately sized AEZs around receptors which are considered to be of high archaeological potential, in consultation with the Archaeological Curators. These areas would be out of bounds to construction activities and to anchoring or jacking-up. Monitoring of any AEZs to ensure there is no disturbance to them would be part of this mitigation.

Although AEZs are fixed, provision should be made for them to be refined or removed (with agreement of the Archaeological Curators) as the project progresses, subject to additional archaeological assessment of subsequent surveys that may be required. Surveys could include further geophysical, ROV, or diver surveys. In addition, in order to maximise the potential benefits of any further surveys, archaeological advice should be sought during the planning stages.

The recommended AEZs all have the potential to be amended or removed at a later date, should further information become available that proves their associated features are not of archaeological potential or represent more widely dispersed sites. This report is intended to inform the decision-making process for confirming the final AEZs.

There is currently one charted wreck (2009) located within the boundaries of the proposed development (see Figure 2 in Appendix 12.1). This site is located on the edge of the maintenance dredge area which covers a wide area to allow maintenance dredging of the dominant navigation channel, taking account of the highly mobile nature of the existing channels and banks. This was recorded as buried in sand within Mostyn Church in 2019, however its marker buoy was withdrawn. The site could possibly be completely buried in sand, or possibly erroneously positioned. However, as a record of potential archaeological interest, a precautionary AEZ of 100 m is recommended (Figure 3 in Appendix 12.1).

Seabed features of archaeological potential

For features of archaeological potential, avoidance of these features by micro-siting is recommended if they are proposed to be directly impacted by the proposed development. If micro-siting is not possible, then further appraisal to ascertain the nature of the features may be required.

Reduction of impact can be achieved by means of appropriate mitigation identified through potential opportunities for further investigation of assets (e.g. during pre-installation surveys which may include visual survey methods and unexploded ordnance (UXO) assessment). Further investigations mean that anomalies can either have their archaeological value removed, if they prove to be of non-anthropogenic nature or modern, or their value as archaeological assets confirmed. If their value is confirmed, mitigation in the form of either avoidance (which may be enacted by the implementation of an AEZ) or through remedying or offsetting measures as identified through a Written Scheme of Investigation (WSI) which includes a Protocol for Archaeological Discoveries (PAD).

The WSI will detail the agreed mitigation that will be in place during the construction and operation of the proposed development. The implementation of a WSI is the mitigation, rather than the document itself. The WSI will be developed in line with Historic Environment guidance for Port and Harbour development (Historic England 2016), which sets out agreed archaeological methodologies. The WSI will be set out based on the mitigation measures recommended in this chapter and will be subject to approval by the Archaeological Curators.

In cases where avoidance is either inappropriate or impossible, the damage to archaeological assets should be offset. Any mitigation strategy will be identified through a WSI and any recommended methods will be covered by a specific Method Statement, approved by the Archaeological Curator, should they be implemented.

Protocol for archaeological discoveries (PAD)

If previously unknown sites or material are encountered during the different phases of the proposed development, measures will be taken to reduce the level of impact. In order to provide for these unexpected discoveries a PAD will be adopted. The PAD is a system for reporting and investigating unexpected archaeological discoveries encountered during installation activities, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD. The PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection of important features prior to further activities in the vicinity. The PAD provides a mechanism to comply with the MSA 1995, including notification of the Receiver of Wreck, and accords with the Code of Practice for Seabed Developers (JNAPC, 2006).

Remedying and offsetting

In cases where avoidance is either inappropriate or impossible, the damage to archaeological receptors should be offset. In the case of seabed prehistoric receptors, this can be achieved by undertaking a staged palaeoenvironmental assessment of deposits with High geoarchaeological potential, principally peat deposits. Pollen and macrofossil assessment, supported by radiocarbon dating, will provide information on age and vegetation history of the terrestrial environment, providing a landscape context to any prehistoric activity within the area.

Within the study area seabed grab sampling has been undertaken to support the application of the MEPE Project, along with boreholes for contamination analysis, described in more detail in Chapter 6 Physical Processes. A Stage 1 geoarchaeological review of these datasets may determine the potential for seabed prehistory and palaeoenvironmental receptor potential within the dredging area and within the context of extensive capital and maintenance dredging history; and if necessary support remedying and offsetting measures defined in a WSI and relevant Scope of Works.

Recovery of artefacts and/or other archaeological receptors should be a final resort when all other mitigation has failed. Any recovery should be completed under the supervision of an appropriately qualified and experienced marine archaeologist. If required, recovery methods will be identified through a WSI and detailed in the site-specific Method Statement.

A final method would include the recording of sites that cannot be preserved. Due to the vast differences in practice and implementation between these methods, each will be covered by a specific Method Statement agreed in consultation with the Archaeological Curator.

Residual effects

Following the application of appropriate secondary mitigation, as outlined above, including the implementation of AEZs to protect high value receptors, further appraisal of seabed features of

archaeological potential, and a PAD for unknown assets, the magnitude is considered to be negligible and the impact assessed as **insignificant**.

It should be noted that in some cases, the application of appropriate mitigation, such as an archaeological investigation of seabed anomalies prior to impact or reported through a PAD, could lead to effects of **minor to moderate beneficial** significance. For example, undertaking further geoarchaeological assessment of geotechnical samples and enhancing knowledge of the wider prehistoric landscape or discovery of a wreck of interest, and sharing that knowledge.

Any maintenance dredging works to be carried out during the operational phase will have a relatively small and defined footprint, and significant impacts would have already likely occurred during the construction phase. With the implementation of the appropriate mitigation measures set out above the significance of any direct or indirect effects on marine archaeology will be reduced significantly and the effect assessed as **insignificant**.

12.9 Summary of impacts

A summary of the impact pathways that have been assessed, the identified residual impacts and level of confidence is presented in Table 12.7. Following the application of mitigation measures, the residual effects on marine heritage receptors from direct impacts during the construction and operation of the proposed development are anticipated to be **insignificant**. With regards to indirect impacts, the residual effects on marine heritage receptors are anticipated to be **insignificant**.

Table 12.7 Summary of potential impact, mitigation measures and residual impacts for marine archaeology

Receptor	Impact Pathway	Impact Significance	Mitigation Measures	Residual Impact	Confidence
Construction Phase					
Known and potential seabed prehistory receptors	Direct disturbance to seabed causing damage to receptors	Major adverse	Offsetting by means of geoarchaeological assessment of geotechnical surveys	Minor to moderate beneficial - as long as geotechnical data are retained, analysed, and reported on by a qualified geoarchaeologist	High
Known and potential maritime receptors and aviation receptors Currently unknown archaeological sites and artefacts	Direct disturbance to seabed causing damage to receptor	Major adverse	Avoidance via implementation of AEZs where deemed appropriate; WSI (and any supporting activity-specific Method Statements) and Reduction via a PAD	Insignificant	High
Known and potential seabed prehistory receptors, maritime and aviation receptors	Direct impacts from use of jack-up barges	Moderate to major adverse	Avoidance via implementation of AEZs where deemed appropriate; WSI (and any supporting activity-specific Method Statements) and Reduction via a PAD	Insignificant	High
Known and potential seabed prehistory receptors, maritime and aviation receptors)	Indirect disturbance to receptors due to changes to the hydrodynamic and sedimentary regimes	Insignificant	N/A	Insignificant	Medium

Receptor	Impact Pathway	Impact Significance	Mitigation Measures	Residual Impact	Confidence
Operational Phase					
Known and potential seabed prehistory receptors, maritime and aviation receptors	Direct disturbance to previously not impacted seabed causing damage to receptors	Major adverse	Avoidance via implementation of AEZs where deemed appropriate; WSI (and any supporting activity-specific Method Statements) and Reduction via a PAD.	Insignificant	High
Known and potential seabed prehistory receptors, maritime and aviation receptors	Direct impacts from use of anchors by vessels	Moderate to major adverse	Avoidance via implementation of AEZs where deemed appropriate; WSI (and any supporting activity-specific Method Statements) and Reduction via a PAD.	Insignificant	High
Known and potential seabed prehistory receptors, maritime and aviation receptors	Indirect disturbance to receptors due to potential scour and plume effects resulting in increased protection to, or deterioration through erosion	Insignificant	No mitigation is recommended as a result of negligible significance of impact	Insignificant	Medium

12.10 References

Bicket, A., Tizzard, L., (2015). A review of the submerged prehistory and palaeolandscapes of the British Isles, Proceedings of the Geologists' Association 126 (6): 643–663, doi.org/10.1016/j.pgeola.2015.08.009

Cadw, (1999). Caring for Coastal Heritage. Cadw, Cardiff.

Cadw, (2009). Caring for Military Sites of the Twentieth Century. Cadw, Cardiff.

Cadw, (2011). Conservation Principles for the Sustainable Management of the Historic Environment in Wales. Cadw, Cardiff.

Cadw, (2020). Managing the Marine Historic Environment of Wales. Cardiff.

Department for Environment, Food and Rural Affairs, (2009). Our Seas- a shared resource. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ourseas-2009update.pdf (accessed October 2022).

Department for Transport, (2012). National Policy Statement for Ports. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-ports (accessed October 2022).

English Heritage (now Historic England), (2012). Ships and Boats: Prehistory to Present: Designation Selection Guide. London, English Heritage.

Historic England, (2016). The Assessment and Management of Marine Archaeology in Port and Harbour Development. London, Historic England.

Flemming, N. C., (2005). The Scope of Strategic Environmental Assessment of Irish Sea Area SEA6 in regard to Prehistoric Archaeological Remains. Crown copyright.

Joint Nautical Archaeology Policy Committee, (2006). JNAPC Code of Practice for Seabed Development. York, Joint Nautical Archaeology Policy Committee.

Lynch, F., Aldhouse-Green, S., and Davies, J. L., (2000). Prehistoric Wales. Stroud, Sutton Publishing.

PIANC, (2014). Dredging and Port Construction: Interaction with Features of Archaeological or Heritage Interest, Guidance Document No 124-2014.

The Crown Estate, (2014). Offshore Renewables Protocol for Archaeological Discoveries (ORPAD). The Crown Estate.

Wessex Archaeology, (2006). On the importance of shipwrecks: final report. York: Archaeology Data Service. Retrieved May 2022, from https://doi.org/10.5284/1000313.

Wessex Archaeology (2008). Aircraft Crash Sites at Sea: A Scoping Study. London. English Heritage.

12.11 Abbreviations/Acronyms

AEZ	Archaeological Exclusion Zone
AMAA	Ancient Monuments and Archaeological Areas
CPAT	Clwyd-Powys Archaeological Trust
DBA	Desk Based Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
FUDP	Flintshire County Council Unitary Development Plan
HER	Historic Environment Record
JNAPC	Joint Nautical Archaeology Policy Committee
LGM	Last Glacial Maximum
MCAA	Marine and Coastal Access Act
MEPE	Mostyn Energy Park Extension
MHW	Mean High Water
MHWS	Mean High Water Springs
MPS	Marine Policy Statement
MSA	Merchant Shipping Act
NMRW	National Monuments Record of Wales
NPRN	National Primary Record Number
NPSfP	National Policy Statement for Ports
NRW	Natural Resources Wales
ORPAD	Offshore Renewables Protocol for Archaeological Discoveries
PAD	Protocol for Archaeological Discoveries
PIANC	World Association for Waterborne Transport Infrastructure
PMRA	Protection of Military Remains Act
PPW	Planning Policy Wales
PWA	Protection of Wrecks Act
RCAHMW	Royal Commission on the Ancient and Historical Monuments of Wales
RoRo	Roll on Roll off
ROV	Remotely Operated Underwater Vehicle
SOC	Society
TSHD	Trailing Suction Hopper Dredger
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
WID	Water Injection Dredging
WNMP	Welsh National Marine Plan
WSI	Written Scheme of Investigation

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

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