

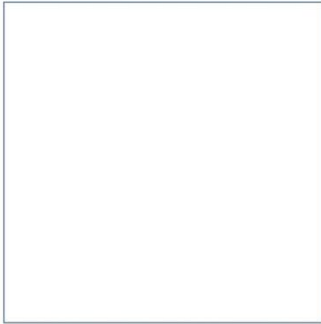
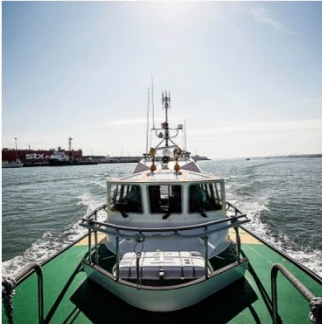
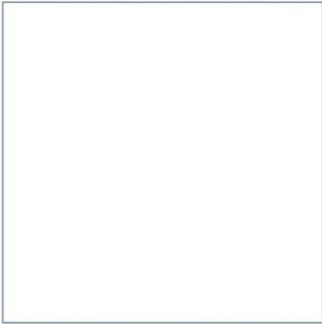
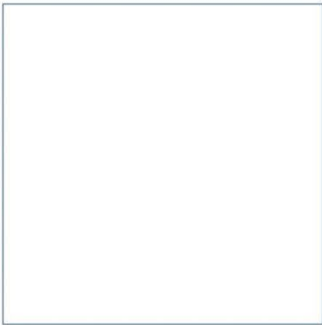
# Port of Mostyn

## Mostyn Energy Park Extension

Environmental Statement

Chapter 13: Cumulative and In-combination Effects

December 2022



Innovative Thinking - Sustainable Solutions

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# Mostyn Energy Park Extension

Environmental Statement



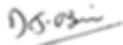
Chapter 13: Cumulative and In-combination Effects

December 2022



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# 13 Cumulative and In-combination Effects

## 13.1 Introduction

If the MEPE Project is approved, construction and operation of the project may well be undertaken at the same time as a number of other plans, projects and activities. These other plans, projects or activities may have the potential to result in additional or modified impacts on the same receptors as those identified for the MEPE Project alone, resulting in a cumulative and/or in-combination impact.

In undertaking the environmental assessment of the MEPE Project as a whole, full account has been taken of the likely effects of the proposed development on all relevant receptors, as noted in the preceding chapters. Under the Marine Works EIA Regulations, there is a requirement to assess any other plans, projects or activities, including any impacts that do not directly overlap spatially but may indirectly result in a cumulative and/or in-combination impact in light of the MEPE Project. It should be noted that this exercise also informs the assessment of in-combination impacts as required by the Habitats Regulations.

The Marine Works EIA Regulations specifically reference 'cumulative' effects, while the Habitats Regulations refer to 'in-combination' effects. In practice, however, this is interpreted as referring to both cumulative and in-combination effects because the assessments, whether for an EIA or HRA, need to take into account the combined influence of all of the environmental pressures acting upon the relevant receptors in assessing the significance of environmental effects.

On this basis, the principal difference between the cumulative assessment for EIA and the in-combination assessment for HRA is the range of receptors included in the assessment. For the purposes of this ES, the range of features to be assessed needs to cover both environmental receptors (including protected interest features) and other human activities and interests that might be affected. The HRA on the other hand, focuses solely on the relevant interest features potentially affected within the internationally designated sites that have been screened into the assessment.

This chapter provides an assessment of the cumulative and in-combination effects of the MEPE Project. This chapter has been prepared by ABPmer.

Section 13.2 provides a definition of the study area for the cumulative and in-combination assessment, Section 13.3 presents the impact assessment approach that has been followed and Section 13.4 details the consultation which has taken place. Section 13.5 describes the legislation, policy and guidance position in respect of this topic and Section 13.6 describes the baseline conditions of the study area in terms of relevant plans, projects and activities. The cumulative and/or in-combination effects associated with the proposed development alone are presented in Section 13.7 and the cumulative and/or in-combination effects associated with other plans, projects or activities are presented in Section 13.8. Mitigation measures and residual effects are reviewed in Section 13.9 and Section 13.10 provides an overall final summary of the assessment.

Figure 13.1 supports the description of the existing environment (baseline) by showing the location of other relevant projects located in the study area that have been scoped into the cumulative and in-combination assessment.

The individual EIA topic assessments (Chapters 6 to 12) have informed the outcomes of the cumulative and in-combination assessment. Relevant aspects of the cumulative and in-combination assessment have informed the HRA included in Appendix B.

## 13.2 Definition of study area

The study area is the area over which potential direct and indirect cumulative effects of the proposed development alone or in-combination with other plans, projects and activities may occur during construction and operation. The study area is, therefore, defined as the spatio-temporal coverage of all the potential effects associated with the proposed development that have been assessed in this ES together with the area covered by interest features of overlapping and nearby European/Ramsar sites that have been screened into the HRA.

## 13.3 Impact assessment methodology

### 13.3.1 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 identify relevant plans, projects or activities include:

- Nationally Infrastructure Planning website  
<https://infrastructure.planninginspectorate.gov.uk/https://infrastructure.planninginspectorate.gov.uk/>;
- Developments of National Significance Applications on Welsh Government website  
<https://planningcasework.service.gov.wales/> ; and
- Planning Policy e.g. Local Development Plans, Transport Plans (National and Local) and National Policy Statements;
- An up to date list of marine licensable developments on Lle Geo-Portal for Wales  
<http://lle.gov.wales/catalogue/item/MarineLicences>; and
- NRW public register of marine licence applications  
<https://publicregister.naturalresources.wales/>.

### 13.3.2 Determining significance of effects

This cumulative (and in-combination) assessment has considered the effects of the MEPE Project alongside those arising from other plans, projects and activities. Cumulative impacts result from the combined impacts of multiple developments or from the combined effect of individual impacts (e.g. where different project elements in different locations have a cumulative impact on a particular feature). The impacts resulting from a single scheme may not be significant on their own but when combined with impacts resulting from other schemes, these could change the level of significance and potentially become significant.

NRW, in their Scoping Opinion has advised on the data sources that may provide useful information on other projects, as well as the approach to identifying relevant projects (Section 13.4).

The assessment of impact significance has followed the methodology presented in Section 5.3 of this ES. In accordance with published guidance, the assessment has included a detailed evaluation of the importance/value and sensitivity of relevant receptors, as well as details of proposed mitigation measures to avoid or reduce any significant adverse effects.

### Intra-project effects

The assessment of cumulative and/or in-combination effects of the proposed development alone (i.e. intra-project effects) has involved identifying the impact pathways from the individual EIA topic assessments (Chapters 6 to 12) that may have residual adverse impacts and considering whether and to what degree they might have the potential to act on the same receptor.

### Inter-project effects

The assessment of cumulative and/or in-combination effects of the proposed development on other plans, projects and activities (i.e. inter-project effects) has involved identifying and assessing any potential overlap of effects arising from other plans, projects or activities with the effects arising from the MEPE Project and the receptors/topics considered within this ES.

The other plans, projects or activities which have been scoped into this assessment are those that fall into all of the following 3 categories:

- 1) They have been subject to EIA and the EIA has identified a significant environmental effect or they have been subject to HRA and the HRA has concluded no LSE or no AEOI, but residual effects remain;
- 2) Their residual effects (net of any mitigation measures) could interact with the residual effects of the proposed development under consideration, for example by magnifying the effects of the proposed development, or making a receptors/features more sensitive to the effects of the proposed development; and
- 3) They are one of the following:
  - Project started but not yet completed;
  - Projects consented but not started;
  - Ongoing projects subject to repeated authorisations (e.g. annual licences);
  - Applications lodged but not yet determined;
  - Refusals subject to appeals procedures not yet determined;
  - Projects not requiring consent but which have been approved by the competent authority concerned;
  - Proposals in adopted plans;
  - Proposals in draft plans published for consultation;
  - Allocations or other forms of proposals in adopted development plans; and
  - Allocations or other forms of proposals in draft development plans published for consultation.

Projects that have not yet submitted their licence applications are not considered in the cumulative and/or in-combination assessment as there is insufficient publicly available information to be able to undertake a meaningful assessment at this stage, such as is the case for Mona Offshore Wind Farm (OWF), Hynet Carbon Dioxide Pipeline and Morecambe OWF, which are all in the pre-application stage of the National Infrastructure Planning process.

Projects that do not result in any significant effects, LSE or residual effects, have no potential to affect any receptors/features in-combination with the proposed development and have, therefore, not been considered in detail in the in-combination assessment, for example aggregate dredging at Areas 392 and 393 (also known as Hilbre Swash) in Liverpool Bay and the Holyhead Waterfront Redevelopment Scheme Project.

## 13.4 Consultation

Consultation with regard to the outcomes of the formal scoping process and whether there are any likely cumulative and/or in-combination effects of the MEP Extension Project with other plans, projects and activities has been undertaken as appropriate, with NRW.

The consultation that has been undertaken, along with the outcome of such consultation and how it has influenced the cumulative and in-combination assessment is provided in Table 13.1.

Table 13.1. Summary of consultation to date

Consultee	Reference, Date	Summary of Response	How Comments have Been Addressed in this Chapter
NRW	Scoping Opinion, 6 January 2022	The ES must include an assessment of cumulative and in-combination effects.	The cumulative and in-combination effects assessment is presented in this chapter (Chapter 13 of the ES).
NRW	Scoping Opinion, 6 January 2022	The following data sources may provide useful information on other projects for the assessment of cumulative effects: <ul style="list-style-type: none"> <li>▪ The Nationally Significant Infrastructure Projects register;</li> <li>▪ The Developments of National Significance Register;</li> <li>▪ Planning Policy e.g. Local Development Plans, Transport Plans (National and Local) and National Policy Statements; and</li> <li>▪ An up to date list of marine licensable developments on Lle Geo-Portal for Wales.</li> </ul>	These data sources have been considered in the cumulative and in-combination effects assessment (Section 13.3.1).
NRW	Scoping Opinion, 6 January 2022	We advise that limiting projects for cumulative/in-combination assessment to within 2 km of the project is not sufficient for mobile species such as fish and, as per our comments above, we consider MMMUs the appropriate scale to consider impacts on marine mammals.	Relevant projects beyond 2 km from the MEPE Project that have the potential to affect mobile features, including fish and marine mammals have been identified as part of the cumulative and in-combination effects assessment (Section 13.3).  The relevant MMMUs in which the MEPE Project is located in have been used as the appropriate scale to consider impacts on marine mammals.

## 13.5 Implications of legislation, policy and guidance

This section of the chapter sets out key aspects and implications of legislation, policy and guidance that are relevant to the assessment of cumulative and in-combination effects. It builds upon the overarching chapter covering Legislation, Policy and Guidance (Chapter 3).

The potential cumulative and in-combination effects of the MEPE Project have been considered with respect to the requirements of relevant legislation, policy and guidance, including:

- EIA Regulations;
- The Habitats Regulations;
- National Policy Statement for Ports (NPSfP) (DfT, 2012);
- UK Marine Policy Statement (MPS) (HM Government, 2011) as required by Section 44 of the Marine and Coastal Access Act 2009;
- Welsh National Marine Plan (Welsh Government, 2019); and
- Flintshire Local Development Plan (FLDP) (Flintshire Council, 2019).

### 13.5.1 Legislation

#### EIA Regulations

The EIA regulations which apply to the proposed development are the Marine Works EIA Regulations.

The ES documents all the relevant EIA information in accordance with the requirements detailed in Schedule 3 of the Marine Works EIA Regulations. This includes providing a description of the likely significant effects, including *"the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development"*.

When considering cumulative effects, an ES is required to provide information as to how the effects of a given proposal, in this case the MEPE Project, would combine and interact with the effects of other development(s), including projects for which consent has been sought or granted, as well as those already in existence.

#### Habitats Regulations

The Habitats Regulations<sup>1</sup> transposed the Habitats Directive (Directive 92/43/EEC) and the Birds Directive (2009/147/EC) into English law.

Where a development project is located close to, or within, a European/Ramsar site, the "Habitats Regulations" apply. This requires the Competent Authority to determine whether the proposed works have the potential for a LSE on the interest features and/or supporting habitat of a European/Ramsar site either alone or in-combination with other plans, projects and activities and, if so, to undertake an Appropriate Assessment (AA) of the implications of the proposals in light of the site's conservation objectives.

<sup>1</sup> Following the UK leaving the EU, these have been modified by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at: <https://www.legislation.gov.uk/ukxi/2019/579/contents/made> (accessed October 2022).

An HRA has been undertaken and is included in Appendix B. The outcomes of the cumulative and in-combination assessment have informed the HRA.

## 13.5.2 National Policy

### National Policy Statement for Ports (NPSfP)

The NPSfP provides the framework for decisions on proposals for new port developments (DfT, 2012). Section 4.2 of the policy states that a proposal for port infrastructure needs to consider the benefits, including the contribution that the scheme would make to the national, regional or more local need for the infrastructure, against anticipated adverse impacts, including cumulative impacts.

In addition, Section 5.6 of the NPSfP relating to water quality and resources notes that cumulative effects should be described in the ES. These considerations have been assessed in the water quality (Chapter 7) and have informed the cumulative and in-combination assessment presented in this chapter.

In terms of human health, Section 4.16 the NPSfP states that health impacts may affect people simultaneously, so there is a need to consider the cumulative impact on health. The cumulative effect of the proposed development on human health has been considered and is presented in Section 13.7.

### UK Marine Policy Statement (MPS)

The MPS is the framework for preparing marine plans and taking decisions affecting the marine environment. The MPS also sets out the general environmental, social and economic considerations that need to be taken into account in marine planning and provides guidance on the pressures and impacts that decision makers need to consider when planning for and permitting development in the UK marine areas.

In terms of considering cumulative effects in the preparation of marine plans, Paragraph 2.3.1.6 of the MPS states that *"They [Marine Plans] should identify how the potential impacts of activities will be managed, including cumulative effects. Close working across plan boundaries will enable the marine plan authority to take account of the cumulative effects of activities at plan boundaries. The consideration of cumulative effects alongside other evidence may enable limits or targets for the area to be determined in the Marine Plan, if it is appropriate to do so."*

In terms of decision making, paragraph 2.3.2.1 states that *"When considering potential benefits and adverse effects, decision makers should also take into account any multiple and cumulative impacts of proposals, in the light of other projects and activities."* In terms of port development, paragraph 3.4.11 advises that *"When decision makers are advising on or determining an application for an order granting development consent in relation to ports, or when marine plan authorities are developing Marine Plans, they should take into account the contribution that the development would make to the national, regional or more local need for the infrastructure, against expected adverse effects including cumulative impacts."*

### Welsh National Marine Plan (WNMP)

The proposed development is located within the area covered by the WNMP (Welsh Government, 2019). Policies are presented within an economic, social and environmental framework, helping to support the high-level objectives set out in the UK Marine Policy Statement, as well as sustainable development of the marine area.

Objective 1 of the WNMP relates to sustainable economic activity, including port and harbour activities and includes reference to cumulative effects:

*“Objective 1 - Support the sustainable development of the Welsh marine area by contributing across Wales’ well-being goals, supporting the Sustainable Management of Natural Resources (SMNR) through decision making and by taking account of the cumulative effects of all uses of the marine environment.”*

There is also one policy within the WNMP specifically related to cumulative effects, Policy Gov\_01: Cumulative effects *“Proposals should demonstrate that they have assessed potential cumulative effects and should, in order of preference: avoid adverse effects; and/or minimise effects where they cannot be avoided; and/or mitigate effects where they cannot be minimised. If significant adverse effects cannot be avoided, minimised or mitigated, proposals must present a clear and convincing case for proceeding. Proposals that contribute to positive cumulative effects are encouraged”.*

In conformance with Objective 1 and Policy Gov\_01, the cumulative and in-combination effects of the MEPE Project have been assessed and are included in this chapter and also in the HRA (Appendix B).

### 13.5.3 Local Policy

#### Flintshire Local Development Plan (FLDP)

The draft Flintshire Local Development Plan (FLDP), together with relevant supporting documents and evidence, sets out the planning strategy for Flintshire up to 2030, along with the policy framework that will be used to guide how this strategy will be followed and achieved (Flintshire County Council, 2019). Following submission of the FLDP to Welsh Government and the Planning Inspectorate in Oct 2020, the FLDP is presently at the Examination stage.

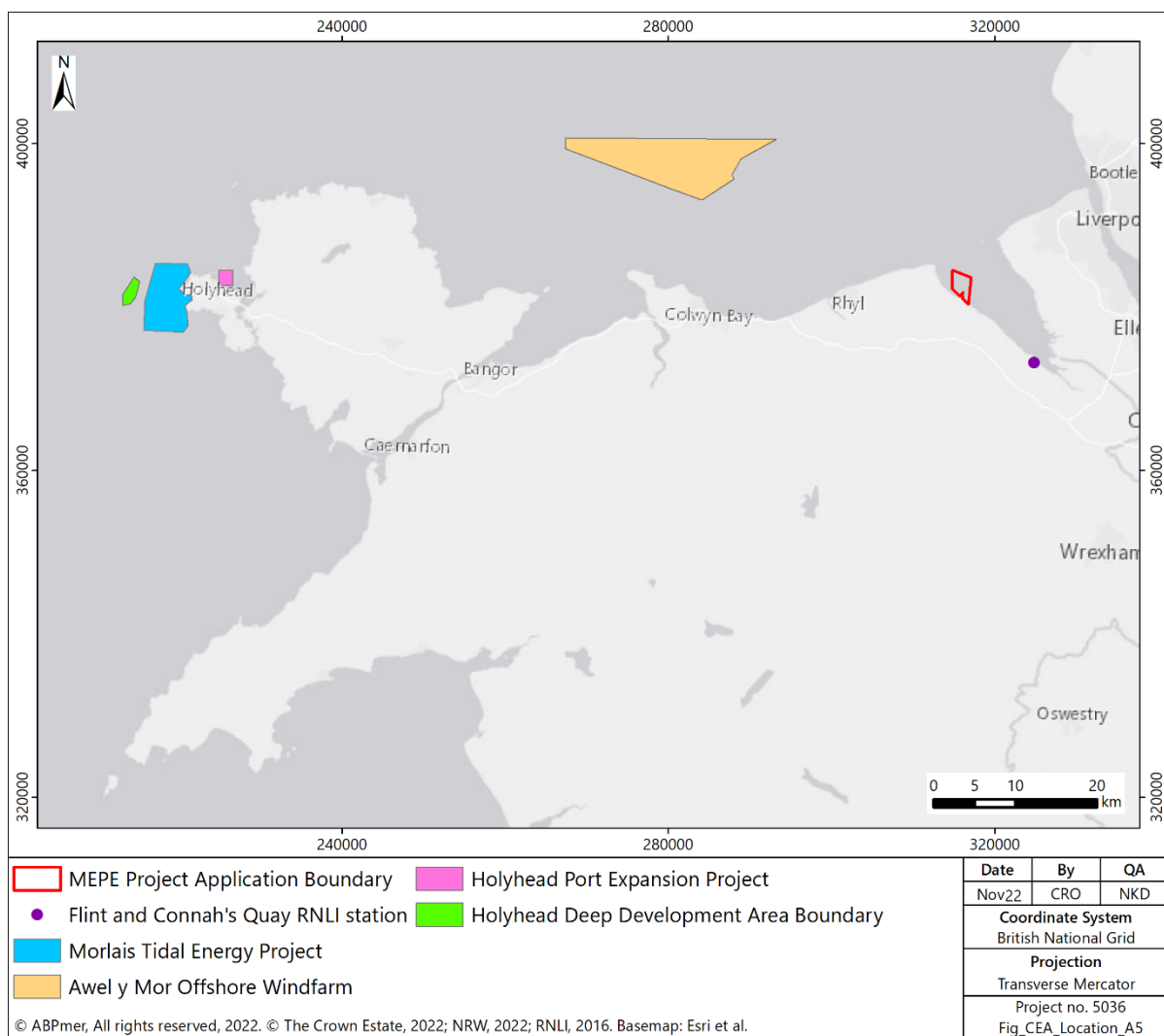
The following policies within the FLDP specifically reference cumulative effects or impacts:

- Policy PE13: Caravan Development in the Open Countryside *“a. The development of static caravan accommodation will be permitted outside the Talacre, Gronant and Gwespyr area (as defined on the proposals map) where: i. there would be no material harm to the landscape character and environmental quality of the surrounding area, either individually or cumulatively with other sites in the vicinity...”* The MEPE Project is not a caravan development and, therefore, this policy is not relevant to the cumulative and in-combination effects assessment;
- Policy HN7: Houses in Multiple Occupation *“Within defined settlement boundaries, proposals to convert an existing building into self-contained accommodation, bedsits or houses in multiple occupation (HMO) will only be permitted if... e. The cumulative impact of development would not lead to the over concentration of HMO’s in the locality to the detriment of community cohesion or residential living standards...”*. The MEPE Project does not involve converting any housing development and, therefore, this policy is not relevant to the cumulative and in-combination effects assessment;
- Policy EN4: Landscape Character *“New development, either individually or cumulatively, must not have a significant adverse impact on the character and appearance of the landscape. Landscaping and other mitigation measures should seek to reduce landscape impact and where possible bring about enhancement”*. The landscape/seascape and visual impact topic has been scoped out of the EIA (Section 5.2.3) and, therefore, this policy is not relevant to the cumulative and in-combination effects assessment; and
- Policy EN5: Area of Outstanding Natural Beauty *“Within the Clwydian Range and Dee Valley AONB, development will only be permitted where it conserves or enhances the natural beauty of the designated area and its setting. In assessing the likely impact of development proposals on*

*the natural beauty of the AONB, cumulative impact will also be taken into consideration".* The Clwydian Range and Dee Valley AONB is located over 10 km from the proposed development and is, therefore, not relevant to the assessment of cumulative and in-combination effects arising from the MEPE Project.

### 13.6 Description of the existing environment

There are a number of plans, projects and activities that have been identified as potentially having cumulative and/or in-combination impacts with the MEPE Project. In summary, the plans, projects and activities that have been identified are included in Table 13.2 below. The potential for these other plans, projects and activities to have cumulative and/or in-combination effects with the proposed development for the purposes of defining the scope of the cumulative and in-combination effects assessment is considered in this table. Figure 13.1 shows the location of other projects that are scoped into the cumulative and in-combination effects assessment.



**Figure 13.1. Location of other projects scoped into the cumulative and in-combination effects assessment**

Table 13.2. Review of other plans, project and activities scoped in and out of the cumulative effects assessment

Plan, Project or Activity	Description	Review of Potential for Cumulative and/or In-combination Impacts
<b>Plans</b>		
Welsh National Marine Plan (WNMP)	WNMP policies are presented within an economic, social and environmental framework, helping to support the high-level objectives set out in the UK Marine Policy Statement, as well as sustainable development of the marine area. Appendix A presents a review of the proposed development against the policies of the WNMP.	The proposed development is considered to comply with the policies of the WNMP (Appendix A). On this basis, therefore, this plan <b>has been scoped out</b> of the cumulative and in-combination effects assessment.
Flintshire Local Development Plan (FLDP)	The relevant policies associated with the FLDP have been considered in the context of the proposed development (see Section 4.9.13).	The MEPE Project is considered acceptable in policy terms and contributes towards the achievement of local plan policies. On this basis, therefore, this plan <b>has been scoped out</b> of the cumulative and in-combination effects assessment.
<b>Projects</b>		
Awel y Môr (AyM) OWF	<p>AyM is a proposed sister project to the operational Gwynt y Môr (GyM) OWF off the coast of North Wales. AyM will comprise an array of offshore Wind Turbine Generators (WTGs) in Welsh waters with an overall capacity greater than 350 Megawatts (MW) (PINS, 2022a).</p> <p>Construction is anticipated to commence in 2026, following preconstruction surveys and works in 2024 and 2025. The Applicant's objective is for AyM to be fully operational and commissioned by 2030 in order to help meet UK and Welsh Government renewable energy targets (PINS, 2022a).</p>	Although the boundary of the AyM Project is located over 15 km from the MEPE Project, there is the potential for both projects to significantly affect the same marine ecological receptors. Given that the application and supporting documents are publicly available, the AyM Project is considered to be sufficiently well defined and, therefore, this project <b>has been scoped into</b> the cumulative and in-combination effects assessment.
Holyhead Deep Project	Holyhead Deep Project is the world's first low-flow tidal stream project, located west of Anglesey, North Wales. In June 2014, Minesto was awarded an Agreement for Lease by The Crown Estate for a 10 MW installation in Holyhead Deep (Minesto, 2022).	Although the boundary of the Holyhead Deep Project is located over 100 km from the MEPE Project, there is the potential for both projects to significantly affect the same marine ecological receptors. Given that the application and supporting documents are publicly

Plan, Project or Activity	Description	Review of Potential for Cumulative and/or In-combination Impacts
	<p>Developing Holyhead Deep into a commercial tidal energy array will be done in phases. As a first step, one 0.5MW demonstrator, called DG500, was installed. The purpose of this first installation was to prove functionality and power production performance in utility scale. The DG500 was successfully installed, commissioned and tested during 2018 and 2019. To facilitate further testing and commercial viability of the Deep Green technology, the applicant, Minesto, has replaced the DG500 with an updated Deep Green Unit (DGU) design called Deep Dragon 12 ("Dragon 12"). The Dragon 12 has been designed within the same design envelope parameters of the DG500 and will be flown with support of the existing offshore infrastructure at the current site.</p> <p>The current marine licence for the installation, operation, maintenance and decommission of a single Dragon 12 unit will expire in April 2024 (NRW, 2022a). Over this period, Minesto will continue the operational testing of the Dragon 12 in advance of obtaining consent for the planned 10 MW array.</p>	<p>available, the Holyhead Deep Project is considered to be sufficiently well defined and, therefore, this project <b>has been scoped into</b> the cumulative and in-combination effects assessment.</p>
<p>Holyhead Port Expansion Project</p>	<p>Holyhead Port is located on Holy Island (Ynys Gybi) on the western side of the Isle of Anglesey, North Wales.</p> <p>Stena Line Ports Ltd ('Stena Line') is proposing to expand Holyhead Port through the reclamation of two areas (known as the Salt Island Expansion and Pelham Patch Development ) to provide new berths and associated landside areas for port-related use, and to develop a new approach channel to 10 m below Chart Datum (CD) (NRW, 2022b).</p> <p>The existing marine licence for the project was issued in July 2021 and will expire in March 2025. It is expected that the proposed scheme would take approximately 24 months to complete.</p>	<p>Although the boundary of the Holyhead Port Expansion Project is located approximately 90 km from the MEPE Project, there is the potential for both projects to significantly affect the same marine ecological receptors. Given that the application and supporting documents are publicly available, the Holyhead Port Expansion Project is considered to be sufficiently well defined and, therefore, this project <b>has been scoped into</b> the cumulative and in-combination effects assessment.</p>

Plan, Project or Activity	Description	Review of Potential for Cumulative and/or In-combination Impacts
<p>Holyhead Waterfront Redevelopment Scheme</p>	<p>The Holyhead Waterfront Redevelopment Scheme is a mixed-use regeneration scheme on the banks of Holyhead New Harbour, on Holy Island / Ynys Gybi, adjacent to Holyhead Breakwater (NRW, 2022c). The project includes new residential properties, public realm, commercial, leisure and retail use (plus associated infrastructure) and a new 250-berth marina with a protective breakwater.</p> <p>The marine licence application and supporting ES anticipated that construction works may start as early as Q4 2021, with a five-year construction programme. However, the necessary consents have yet to be issued for this project and, therefore, the programme is not known.</p>	<p>The boundary of the Holyhead Waterfront Redevelopment Scheme is more than 90 km from the MEPE Project and does not have the potential to significantly affect any of the same marine ecological receptors as the MEPE Project. In particular, the effects of scheme during construction and operation on marine mammals which are highly mobile were assessed as negligible and not significant. On this basis, therefore, the Holyhead Waterfront Redevelopment Scheme <b>has been scoped out</b> of the cumulative and in-combination effects assessment.</p>
<p>HyNet Carbon Dioxide Pipeline</p>	<p>HyNet North West is a hydrogen supply and Carbon Capture and Storage (CCS) project (PINS, 2022b). The goal of the project is to reduce carbon dioxide emissions from industry, homes and transport and support economic growth in the North West of England and North Wales.</p> <p>The project is based on the production of low carbon hydrogen from natural gas. It includes the development of a new hydrogen production plant, pipeline and the creation of CCS infrastructure (PINS, 2022b).</p> <p>Hydrogen will be sent via new pipelines to a range of industrial sites, for injection as a blend into the existing natural gas network and for use as a transport fuel. Resulting CO<sub>2</sub> will be captured and, together with CO<sub>2</sub> from local industry, which is already available, sent by pipeline for storage offshore in the nearby Liverpool Bay gas fields.</p>	<p>A Development Consent Order (DCO) application for the building and operating of the new underground CO<sub>2</sub> pipeline, including some above-ground features, from Cheshire in England to Flintshire in Wales, was submitted on 3 October 2022 and has been accepted for examination by the Planning Inspectorate (PINS, 2022b). However, this element of the project comprising the DCO application is all inland and does not include any elements that take place in or near to the marine environment and, therefore, there is considered to be no potential spatial overlap of significant effects with the MEPE Project. On this basis, this project <b>has been scoped out</b> of the cumulative and in-combination effects assessment.</p>

Plan, Project or Activity	Description	Review of Potential for Cumulative and/or In-combination Impacts
	<p>The only element of the HyNet North West Project that will take place in the marine environment is the construction and/or repurposing of onshore/offshore pipelines to transport CO<sub>2</sub>, and the creation of offshore CO<sub>2</sub> storage located within Liverpool Bay.</p>	
<p>Mona Offshore Wind Project</p>	<p>The area within which the offshore wind turbines will be located is located in the east Irish sea, 28 km from the north coast of Wales and 40 km from the northwest coast of England (PINS, 2022c). In accordance with the Round 4 bid, the proposed capacity of the Mona Offshore Wind Project is 1.5 Gigawatts (GW).</p> <p>The application for development consent and marine licence is planned to be submitted to the Planning Inspectorate and NRW, respectively, in Q4 2023 (PINS, 2022c).</p>	<p>The potential array area for the Mona Offshore Wind Project is located approximately 40 km from the MEPE Project. The licence applications have not yet been submitted and, therefore, there is insufficient publicly available information to be able to confirm the timescales and possible spatio-temporal overlap of any significant effects with the MEPE Project. This project is not, therefore, considered sufficiently well-defined to adequately evaluate the spatio-temporal scale of cumulative and in-combination effects at this stage. On this basis, this project <b>has been scoped out</b> of the cumulative and in-combination effects assessment.</p>
<p>Morlais Tidal Energy Project</p>	<p>The Morlais Tidal Energy Project will provide a generating capacity of up to 240 MW of tidal energy off the north west coast of Anglesey, within the Morlais Demonstration Zone (MDZ) (NRW, 2022d).</p> <p>In order to mitigate collision risk for marine mammals and birds, an adaptive management approach is being adopted for the Project, whereby a first phase of devices will be deployed and monitored prior to the deployment of further devices. The scale of the first phase will be subject to review post consent depending on the device type(s) proposed to be deployed.</p> <p>The existing marine licence for the project was issued in December 2021 and will expire in December 2060.</p>	<p>Although the boundary of the Morlais Tidal Energy Project is located approximately 90 km from the MEPE Project, there is the potential for both projects to significantly affect the same marine ecological receptors. Given that the application and supporting documents are publicly available, the Morlais Tidal Energy Project is considered to be sufficiently well defined and, therefore, this project <b>has been scoped into</b> the cumulative and in-combination effects assessment.</p>

Plan, Project or Activity	Description	Review of Potential for Cumulative and/or In-combination Impacts
<p>Regional Maintenance activities for Royal National Lifeboat Institution (RNLI) stations cited around the coast of Wales (including Flint Lifeboat station and Connah’s Quay on the Dee Estuary)</p>	<p>Maintenance works (whether planned or emergency) to RNLI stations, beach lifeguard units and their supporting infrastructure is vital if the RNLI's lifeboats and lifeguards are to remain fully operational and able to maintain emergency launch response times (NRW, 2022e).</p> <p>Many of the RNLI's lifeboat stations, beach lifeguard units and/or their supporting infrastructure are situated at least partly below MHWS and therefore, unless an exemption applies, a marine licence is required for many maintenance activities. The RNLI's maintenance activities include maintenance to moorings, pontoon berths and lifeboat station boathouses, minor beach re-profiling works, miscellaneous activities associated with safety of lifeboat launch and recovery, and maintenance of some miscellaneous infrastructure, installation, removal and maintenance of beach lifeguard units and navigational dredging. Replacement piling works are not required and do not form part of the marine licence (NRW, 2022e).</p> <p>The existing marine licence for the regional maintenance activities was issued in September 2019 and will expire in April 2029.</p>	<p>Although the nearest RNLI stations that are covered by this licence (namely Flint Lifeboat station and Connah’s Quay) are located more than 10 km from the MEPE Project, they both overlap the Dee Estuary SSSI/SAC/SPA/Ramsar site and, therefore, have the potential to significantly affect the same marine ecological receptors prior to mitigation. The maintenance activities that may be required specifically at these nearest RNLI stations comprise infrequent and reactive minor beach re-profiling works (&lt; 25 m<sup>3</sup>) and maintenance of the slipway structures. Given that the application and supporting documents are publicly available, the maintenance activities are considered to be sufficiently well defined and, therefore, this project <b>has been scoped into</b> the cumulative and in-combination effects assessment.</p>
<b>Activities</b>		
<p>Ports, navigation and shipping</p>	<p>Data from the Port of Mostyn’s records indicate that over the period from 2010 to 2021 inclusive, an average of 455 vessel movements per year were recorded for Mostyn (Chapter 10). This total represents all commercial shipping and dredger movements in the harbour area, not including the daily movements of the OWF service/CTVs. The OWF service/CTVs represent the highest percentage of vessels transiting the study area. These vessels are associated with the operation and maintenance of OWFs in the area, namely North Hoyle, Rhyl Flats and Gwynt-y-Mor OWFs.</p>	<p>The MEPE Project overlaps the navigation channel and approaches into the Port of Mostyn. An increase in the number of vessels transiting in the area during construction and operation has the potential to affect the same mobile interest features of nature conservation sites and their prey that have the potential to be affected by existing vessel movements. On this basis, therefore, this activity <b>has been scoped into</b> the cumulative and in-combination effects assessment.</p>

Plan, Project or Activity	Description	Review of Potential for Cumulative and/or In-combination Impacts
Commercial and recreational fishing	<p>The main fishing activity that takes place within the Dee Estuary is cockle fishing, with some mussel fishing on the English side of the estuary (Chapter 9). Other small and sometimes seasonal fisheries operate in the Dee Estuary including a prawn beam trawl fishery, a small stern trawl flounder fishery (that also lands catches of some plaice) in the main channel of the estuary, drift netting for plaice and sole, and bass fishing. There are a small number of trawlers from Connah’s Quay that may trawl in the estuary from March to July when the cockle fishery is not open and they are not fishing for other species outside the estuary.</p>	<p>Although there is no fishing activity that overlaps the MEPE Project, there is potential for fishing activity in the wider area to affect the same mobile interest features of nature conservation sites and their prey. On this basis, therefore, this activity <b>has been scoped into</b> the cumulative and in-combination effects assessment.</p>
Aggregate dredging	<p>Marine aggregate extraction takes place along the north coast of Wales in Liverpool Bay. The nearest areas licensed for aggregate dredging and extraction are Area 392/393, known as Hilbre Swash (NRW, 2013). Aggregate dredging has taken place in this existing licence area and previously in an area immediately to the south for over 50 years.</p>	<p>The nearest marine aggregate licence area, Area 392/393, is located more than 10 km from the MEPE Project and is not predicted to significantly affect any of the same marine ecological receptors as the MEPE Project. An HRA screening exercise was undertaken to determine if continued aggregate dredging at Area 392/393 could have an LSE on European sites. The HRA screening exercise concluded that there will not be any LSE to any European sites. On this basis, therefore, marine aggregate dredging activity <b>has been scoped out</b> of the cumulative and in-combination effects assessment.</p>

## 13.7 Impact assessment

This section identifies the potential likely cumulative and in-combination effects on EIA topics or receptors scoped into the ES as a result of the construction and subsequent operation of the MEPE Project.

The following types of cumulative and/or in-combination effects have been considered:

- Proposed works alone (intra-project effects); and
- Other plans, projects and activities (inter-project effects).

Individual impacts on EIA topics or receptors as a result of the MEPE Project have been assessed as necessary as part of individual topic ES chapters (Chapters 6 to 12).

### 13.7.1 Proposed works alone - intra-project effects

The impact pathways identified within each topic chapter of this ES as having residual adverse impacts (i.e. minor adverse or greater) that have the potential to act on the same receptor are discussed and assessed below. For each receptor, the impact pathways with residual adverse impacts from across all topic chapters have been identified and the potential cumulative/in-combination effects assessed.

#### Water and sediment quality

The residual impacts associated with the following impact pathways from the water and sediment quality assessment (Chapter 7) have the potential to act on water and sediment quality receptors:

- Changes to dissolved oxygen concentrations as a result of increased SSC during capital dredging and disposal activities: **Minor adverse**;
- Changes to nutrient concentrations in water during capital dredging and disposal activities: **Insignificant to minor adverse**;
- Changes to dissolved oxygen concentrations as a result of increased SSC during operation: **Minor adverse**; and
- Changes to nutrient concentrations in water during operation: **Insignificant to minor adverse**.

Although there is the potential for a number of residual impacts to act on water and sediment quality receptors, these impacts have limited potential to result in a significant cumulative / in-combination effect as the scale of the changes will be small, short-lived and intermittent.

Following the impact assessment methodology, the probability of occurrence and of cumulative impact pathways interacting is considered to be high but the magnitude of change will be small. The exposure to change is, therefore, assessed as low. Overall, taking account of the sensitivity and importance of water and sediment quality receptors, the potential cumulative and in-combination effects are assessed as **insignificant to minor adverse** and not significant.

#### Benthic habitats and species

The residual impacts associated with the following impact pathways from the nature conservation and marine ecology assessment (Chapter 8) have the potential to act on benthic habitats and species:

- Direct loss of seabed habitat as a result of the new quay wall: **Insignificant to minor adverse**;
- Changes to subtidal habitats and species as result of the removal of seabed material during dredging: **Insignificant to minor adverse**; and
- The potential introduction and spread of non-native species: **Insignificant to minor adverse**.

Although there is the potential for these residual impacts to act on benthic habitats and species, these impacts have limited potential to result in a significant cumulative/in-combination effect as they will be managed through a package of enhancement and mitigation measures.

Following the impact assessment methodology, the probability of occurrence and of cumulative impact pathways interacting is considered to be high but the magnitude of change will be small at worst with the application of enhancement measures, and mitigation measures, including biosecurity control measures within the Construction Environment Management Plan (CEMP) in accordance with guidance. The exposure to change is, therefore, assessed as low. Overall, taking account of the sensitivity and importance of benthic habitats and species, the potential cumulative and in-combination effects are assessed as **insignificant to minor adverse** and not significant.

### Fish and shellfish

The residual impacts associated with the following impact pathways from the nature conservation and marine ecology assessment (Chapter 8) have the potential to act on fish:

- Direct loss or changes to fish and shellfish populations and habitat: **Insignificant to minor adverse**; and
- Effects of underwater noise during impact piling on fish: **Insignificant to minor adverse**.

Although there is the potential for these residual impacts to act on fish, these impacts have limited potential to result in a significant cumulative/in-combination effect as they will be managed through a package of mitigation measures.

Following the impact assessment methodology, the probability of occurrence of both impacts affecting fish is considered to be high but the magnitude of change will be small at worst with the application of appropriate best practice measures, including soft start procedures during piling and use of vibro piling where possible. The exposure to change is, therefore, assessed as low. Given the overall low to moderate sensitivity of fish with the mitigation measures in place, and their low to high importance (depending on the nature conservation and/or commercial value of individual species), the potential cumulative and in-combination effects are assessed as **insignificant to minor adverse** and not significant.

### Coastal waterbirds

The residual impacts associated with the following impact pathways from the nature conservation and marine ecology assessment (Chapter 8) have the potential to act on coastal waterbirds:

- Direct loss and change to intertidal feeding and roosting habitat: **Minor adverse**; and
- Noise and visual disturbance during construction and operation: **Minor adverse**.

Although there is the potential for these residual impacts to act on waterbirds, these impacts have limited potential to result in a significant cumulative/in-combination effect as they will be managed through a package of mitigation measures.

Following the impact assessment methodology, the probability of occurrence of both impacts affecting waterbirds is considered to be high but the magnitude of change will be small at worst with the application of appropriate best practice measures, including soft start procedures during piling and use of screening. The exposure to change is, therefore, assessed as low. Given the overall low to moderate sensitivity of waterbirds depending on the species, and their high nature conservation importance, the potential cumulative and in-combination effects are assessed as **minor adverse** and not significant.

## Fisheries

The residual impacts associated with the following impact pathways from the fisheries assessment (Chapter 9) have the potential to act on cockle fisheries:

- Interference with fishing activities due to vessel movements obstructing navigation routes to fishing grounds during construction: **Insignificant to minor adverse**; and
- Potential indirect impacts on stocks of target finfish and shellfish species during construction: **Insignificant to minor adverse**.

Although there is the potential for these residual impacts to act on cockle fisheries, these impacts have limited potential to result in a significant cumulative/in-combination effect as they will be managed through existing standard good practice, namely the Port of Mostyn's and Dee Conservancy's Marine Safety Management System (SMS), including issuing Local Notices to Mariners.

Following the impact assessment methodology, the probability of occurrence of both impacts affecting cockle fisheries is considered to be high but the magnitude of change will be small at worst with the application of standard practice measures. The exposure to change is, therefore, assessed as low. Given the overall moderate sensitivity of the cockle fishery due to its defined fishing grounds, and their regional value and, thus, moderate importance, the potential cumulative and in-combination effects are assessed as **insignificant to minor adverse**.

## People and/or assets

The residual impacts associated with the following impact pathways from the commercial and recreational navigation assessment (Chapter 10) have the potential to act on people and/or assets:

- Collision between commercial vessels: **Medium and tolerable**<sup>2</sup>;
- Collision between commercial and small/fishing vessels: **Medium and tolerable**;
- Collision between a commercial vessel and a development structure: **Medium and tolerable**;
- Grounding / stranding of a commercial vessel: **Medium and tolerable**;
- Grounding of a self-propelled Jack-up barge: **Medium and tolerable**;
- Wake wash effects resulting in grounding, capsize or sinking of a small/fishing vessel: **Low to medium and tolerable**; and
- Pollution of river and estuarine waters: **Medium and tolerable**.

Although there is the potential for a number of residual impacts to act on people and/or assets, these impacts have limited potential to result in a significant cumulative / in-combination effect. Any cumulative/in-combination effects on humans will either be temporary or highly unlikely and managed through a package of existing control measures at the Port of Mostyn.

Following the impact assessment methodology, the probability of occurrence is considered to be low and the magnitude of change will range between negligible and large depending on its consequence to people and assets. The exposure to change is, therefore, assessed as negligible to low. Given the overall moderate sensitivity of people and assets with the application of appropriate controls to manage navigational risks, and their high importance, the potential cumulative and in-combination effects are assessed as **insignificant to minor adverse**.

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<sup>2</sup> This is standard terminology for assessing risks in Navigational Risk Assessments (NRAs) and is considered to be equivalent to minor adverse and not significant in EIA terms.

### 13.7.2 Other plans, projects and activities (inter-project effects)

Based on the available evidence and data sources identified in Section 13.6, the potential overlap of effects arising from other projects and ongoing activities that have been scoped into the cumulative and in-combination effects assessment (Table 13.2) have been considered. Table 13.3 summarises the potential overlap with the physical, biological, historic and human environment receptors/topics considered within this ES followed by an assessment of the potential cumulative and/or in-combination effects on each receptor/topic in Table 13.4.

**Table 13.3. Potential overlap of other plans, projects and/or activities with EIA receptors/topics**

Receptor/Topic	AyM OWF <sup>3</sup>	Holyhead Deep Project <sup>4, 5</sup>	Holyhead Port Expansion Project <sup>6</sup>	Morlais Tidal Energy Project <sup>7</sup>	Regional Maintenance Activities for RNLI Stations <sup>8</sup>	Ports, Navigation and Shipping	Commercial and Recreational Fishing
Physical processes	✓	✓	✓	✓			
Water and sediment quality	✓	✓	✓	✓			
Nature conservation and marine ecology	✓	✓	✓	✓	✓	✓	✓
Fisheries	✓	✓	✓	✓		*	*
Commercial and recreational navigation	✓	✓	✓	✓		*	*
Flood risk and drainage	✓			✓			
Cultural heritage and marine archaeology	✓			✓	✓		
* Ongoing fishing activities and ports, navigation and shipping activities form part of the baseline environment that the proposed development has already been assessed against within the fisheries assessment (Chapter 9) and commercial and recreation navigation assessment (Chapter 10). The interaction between these activities and the MEPE Project has, therefore, not been re-assessed in this chapter.							

<sup>3</sup> [Awel y Môr Offshore Wind Farm | National Infrastructure Planning \(planninginspectorate.gov.uk\)](#)

<sup>4</sup> [Public register - Customer Portal \(naturalresources.wales\)](#)

<sup>5</sup> <https://minesto.com/projects/holyhead-deep>

<sup>6</sup> [Public register - Customer Portal \(naturalresources.wales\)](#)

<sup>7</sup> [Public register - Customer Portal \(naturalresources.wales\)](#)

<sup>8</sup> [Public register - Customer Portal \(naturalresources.wales\)](#)

**Table 13.4. Summary of predicted cumulative/in-combination effects on receptors**

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
Physical Processes	<p>Other projects and ongoing activities, together with the proposed development, have the potential to result in cumulative/in-combination effects on physical processes, namely changes in suspended sediment concentrations (SSC), changes in seabed levels and changes in sediment type/character, and changes to the hydrodynamic and/or sediment transport regime.</p> <p><u>AyM OWF Project</u>                      The AyM OWF EIA applied a worst case Maximum Design Scenario approach which concluded that the level of residual effect for all physical processes receptors is either negligible or minor adverse and not significant for all phases of development. Furthermore, these effects are restricted to the area of Constable Bank/Rhyl Flats and the adjacent coast, located around 20 km from the MEPE Project.</p> <p><u>Holyhead Deep Project</u>                      The Holyhead Deep Project is located over 100 km from the MEPE Project and will not result in any significant effects on physical processes during construction/installation, operation and maintenance. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><u>Holyhead Port Expansion Project</u>                      The proposed capital dredge for the Holyhead Port Expansion Project will result in very small magnitude changes in sea bed level and the impacts on the coastal processes receptors, including those associated with nearby nature conservation sites, would not be significant. The overall impact of capital dredging for the project under a worst-case scenario on sea-bed level changes is negligible. The overall impact of sediment disposal of dredge arisings at Holyhead North disposal site under a worst-case scenario on sea-bed level changes is negligible. This is because the predicted spatial distribution of the disposed sediment is confined to the disposal site. The Holyhead Port Expansion Project is located approximately 90 km from the MEPE Project and there is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur on physical processes receptors.</p> <p><u>Morlais Tidal Energy Project</u>                      Monitoring of the physical processes changes associated with the Morlais Tidal Energy Project will be undertaken to assist with the validation of the complex hydrodynamic and sediment modelling outputs of the EIA. The Morlais Tidal Energy Project is located approximately 90 km from the MEPE Project and there is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur on physical processes receptors.</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p><b>Conclusion:</b> Taking account of the impacts on physical processes of the MEPE Project alone (Chapter 6), the probability of occurrence of cumulative/in-combination effects from other projects is negligible and the magnitude of the changes are considered to be small as a worst case. The exposure to change is, therefore, assessed as negligible. Overall, when considering the nature and spatio-temporal scale of changes resulting from other projects acting together with the proposed development, the cumulative and/or in-combination effects on physical processes receptors are assessed as <b>insignificant</b>.</p>
<p>Water and sediment quality</p>	<p>Other projects and ongoing activities, together with the proposed development, have the potential to result in cumulative/in-combination effects on water and sediment quality, including potential changes to dissolved oxygen, potential changes to levels of chemical contaminants (including accidental spillages) in water, and potential impacts from redistribution of sediment-bound chemical contaminants.</p> <p><u>AyM OWF Project</u> The AyM OWF EIA applied a worst case Maximum Design Scenario approach which concluded that the level of residual effect for all water and sediment quality receptors, including Bathing Waters and WFD waterbodies, is either negligible or minor adverse and not significant for all phases of development. The Zone of Influence (Zol) for the AyM Project is limited to off the northern coast of Wales, outside of the Dee Estuary, and the changes in water and sediment quality will not spatially overlap with the changes brought about by the MEPE Project. Furthermore the construction of the AyM Project is not anticipated to commence until 2026. There is, therefore, no potential overlap with the construction of the MEPE Project.</p> <p><u>Holyhead Deep Project</u> The Holyhead Deep Project is located over 100 km from the MEPE Project and will not result in any significant effects on water quality during construction/installation, operation and maintenance. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><u>Holyhead Port Expansion Project</u> Impacts to marine water quality as a result of increased suspended sediment concentrations during the construction phase of the Holyhead Port Expansion Project represents a short-term effect due to the rapid rate of dispersion, and are assessed as minor adverse and not significant. However, this project is located approximately 90 km from the MEPE Project and there will, therefore, be no interaction or potential for cumulative and/or in-combination water and sediment quality effects to occur.</p> <p><u>Morlais Tidal Energy Project</u> Measures to avoid and manage any potential water and sediment quality effects from the Morlais Tidal Energy Project are included within a Pollution Prevention and Management Plan (PPMP) and CEMP, and adherence to these plans are a condition of the marine</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p>licence. Furthermore, the Morlais Tidal Energy Project is located approximately 90 km from the MEPE Project and there is, therefore, considered no potential for any interaction or cumulative and/or in-combination water and sediment quality effects to occur.</p> <p><b>Conclusion:</b> Taking account of the residual impacts on water and sediment quality of the proposed development (Chapter 7), and following the impact assessment methodology, the probability of occurrence of cumulative/in-combination effects on water and sediment quality is considered to be negligible and the magnitude is considered to be small/negligible. The exposure to change is therefore assessed as negligible. Overall, when considering the nature and spatio-temporal scale of changes resulting from other projects acting together with the proposed development, the cumulative and/or in-combination effects on water and sediment quality are assessed as <b>insignificant</b>.</p>
<p>Nature conservation and marine ecology</p>	<p>Other projects and ongoing activities, together with the proposed development, have the potential to result in cumulative/in-combination effects on nature conservation and marine ecology receptors.</p> <p><u>AyM OWF Project</u> The HRA for the AyM OWF Project indicates that relevant best practice guidelines will be followed through the implementation of a Biosecurity Plan to minimise invasive non-native species (INNS) introduction/ spread. Any vessels used for the delivery of materials to the site will adhere to industry legislation, codes of conduct and/or best practice to reduce the risk of introduction or spread of INNS. Together with the distance between the Dee Estuary/Aber Dyfrdwy SAC and the Awel y Môr (AyM) OWF Project, and the expectation that the project will have a CEMP and Biosecurity Plan (or similar documentation) to manage the risk of marine INNS, there considered to be no potential for any significant in-combination effect with the MEPE Project.</p> <p>For a project or plan to act in-combination with respect to disturbance resulting from underwater noise, there needs to be temporal overlap between the activities. The underwater noise impact from UXO and piling for the AyM Project is limited to 2027-2029 inclusive. There is, therefore, no potential overlap with the construction of the MEPE Project and no potential for any significant in-combination effect. Furthermore, a piling Marine Mammal Mitigation Protocol (MMMP) will be developed for the AyM Project which will include proposals for soft start and ramp-up of piling to avoid potential injury effects and significant disturbance impacts on marine mammals. While none of the mitigation measures detailed in the MMMP are focused on fish or ornithological features, it is likely that there will be incidental benefits to non-mammal receptors (including fish and birds).</p> <p>Taking into account the distance of the Dee Estuary/Aber Dyfrdwy SAC and River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC from the AyM project array (&gt;20 km at its nearest point), the short-term and localised nature of the impact arising during construction, the likelihood of the instinct for fish migration overriding any potential disturbance effects from noise and no noise from</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p>AyM activities entering the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC, it is not anticipated that significant impacts in relation to underwater noise from piling within the array will occur on migratory fish.</p> <p>Based on the onshore and intertidal components of the AyM Project being a significant distance beyond 500 m from the Dee Estuary SPA/Ramsar site or areas of functionally linked habitat, it is highly unlikely that construction, operation and maintenance (O&amp;M), and to a lesser extent, decommissioning activity of the AyM Project will result in significant visual and/ or noise disturbance to species associated with the Dee Estuary SPA/Ramsar site.</p> <p><u>Holyhead Deep Project</u>                      The Holyhead Deep Project is located over 100 km from the MEPE Project and will not result in any significant effects with the application of mitigation on benthic ecology, fish and shellfish, marine mammals and megafauna, and offshore ornithology during construction/installation, operation and maintenance. An updated underwater noise assessment has been completed for the Holyhead Deep Project on the basis of the revised injury and disturbance threshold criteria proposed by NOAA (2018). In summary, use of the DP vessel and operations as part of the Holyhead Deep Project would not have an adverse impact on marine mammal species. The operational noise levels of the Minesto kite are below the marine mammal injury and disturbance thresholds. Measurements of underwater noise during operation have validated the findings of the EIA. Overall, there is no potential for any cumulative and/or in-combination effects to occur with the MEPE Project.</p> <p><u>Holyhead Port Expansion Project</u>                      Smothering of benthic habitats and species is assessed as negligible during dredging and minor adverse during disposal activities associated with the Holyhead Port Expansion Project. Potential impacts on fish and shellfish within Holyhead Bay is assessed as negligible and minor adverse on fish/shellfish populations within the vicinity of the Holyhead North disposal site. The Holyhead Port Expansion Project is located approximately 90 km from the MEPE Project and there will, therefore, be no overlap or potential for cumulative and/or in-combination effects on benthic habitats and species and fish and shellfish populations.</p> <p>The potential collision risk from construction vessels associated with the Holyhead Port Expansion Project is assessed as negligible for all marine mammal species apart from minor adverse and not significant for bottlenose dolphin. Changes in prey availability are assessed as minor adverse and not significant for Risso’s dolphin and negligible for all other species. The impacts of changes in water quality during dredging and disposal activities are assessed as negligible for marine mammals. Due to the temporary nature, and limited range of impacts, the Holyhead Port Expansion Project will not result in an AEOI on any European sites with marine mammal features. Mitigation measures to reduce the impact of underwater noise on marine mammals have been included as a condition in the marine licence (Ref: CML1931, para 3.25).</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p><u>Morlais Tidal Energy Project</u>                      The potential effects of the Morlais Tidal Energy Project on benthic ecology will be managed as part of a Marine Biodiversity Enhancement Strategy and an Invasive Non-native Species Management Plan. This will include the provision of pre-construction surveys, micro-siting and mitigation that would offset the potential loss of Annex 1 marine habitats and/or OSPAR/Section 7 habitats potentially impacted by the project. The Morlais Tidal Energy Project is located approximately 90 km from the MEPE Project and there will, therefore, be no overlap or potential for cumulative and/or in-combination effects on benthic habitats and species.</p> <p>The potential effects of the Morlais Tidal Energy Project on fish and shellfish, including migratory fish, are assessed as minor adverse and not significant in the ES. The HRA also concluded that there will be no AEOI in relation to migratory fish species. Potential collision risk on migratory risk will be managed through the monitoring measures included in an Environmental Mitigation and Monitoring Plan (EMMP). There will, therefore, be no potential for cumulative and/or in-combination effects on fish and shellfish.</p> <p>If full deployment of the Morlais Tidal Energy Project took place, a potential for a major adverse effect on Guillemot and Razorbill populations has been predicted in the ES due to the collision risk with tidal turbines. The potential adverse impacts will be mitigated by proceeding with the regulated activity in phases using an adaptive management approach. Therefore, the deployments of the initial phase and any further deployments (scaling-up), will only occur at a scale that will not lead to an adverse effect on diving seabirds in line with the EMMP. There will, therefore, be no potential for cumulative and/or in-combination effects on waterbirds.</p> <p>Full deployment of the Morlais Tidal Energy Project would result in the potential for an AEOI as a consequence of collision impacts on bottlenose dolphin, harbour porpoise and/or grey seal with tidal turbines. The potential adverse impacts will be mitigated by proceeding with the regulated activity in phases using an adaptive management approach. Therefore, the deployments of the initial phase and any further deployments (scaling-up), will only occur at a scale that will not lead to an adverse effect on marine mammals in line with the EMMP. In addition, the implementation of a MMMP will reduce the risk of any permanent auditory injury (Permanent Threshold Shift, PTS) to marine mammals as a result of underwater noise during construction. Further mitigation for noise disturbance includes restricting the acoustic deterrent device (ADD) activation time to the minimum required to displace marine mammals and reduce the risk of collisions with tidal devices and only activating ADDs when marine mammals come within close proximity of the tidal devices and arrays. In other words, any risk of potential auditory injury or disturbance as a result of underwater noise would be fully mitigated by the Morlais Tidal Energy Project. There will, therefore, be no potential for cumulative and/or in-combination effects on either waterbirds or marine mammals.</p> <p><u>Regional Maintenance activities for RNLI stations</u>                      The proposed regional maintenance activities for RNLI stations around the coast of Wales, including Flint Lifeboat station and Connah’s Quay located on the Dee Estuary, are not considered to have a significant effect on any protected sites, including the Dee</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p>Estuary SSSI/SAC/SPA/Ramsar site. A biosecurity plan for the maintenance works has been prepared and there is a condition in the marine licence (Ref: CML1820, condition 8.7) which states <i>"The Licence Holder must ensure all equipment, materials, machinery and PPE used are in a clean condition prior to their arrival on site, and upon removal from site, to minimise risk of introducing non-native species into the marine environment."</i> There will, therefore, be no potential for any significant cumulative and/or in-combination effects on nature conservation and marine ecology receptors.</p> <p><u>Commercial and recreational navigation</u>            Although the MEPE Project overlaps the navigation channel and approaches into the Port of Mostyn, there are not anticipated to be any significant cumulative water quality or disturbance effects on mobile marine fauna and their prey from shipping movements during construction and operation of the MEPE Project. This is due to the small and localised scale of the potential changes, and the highly mobile nature and large foraging range of fish, marine mammals and waterbirds. Furthermore, existing commercial vessel activities and ongoing maintenance dredging activities already take place concurrently. Overall, the potential for cumulative impacts through vessel movements and existing port activities on interest features of nature conservation sites and marine ecology receptors is considered to be negligible.</p> <p><u>Commercial and recreational fishing</u>            Fishing is an ongoing activity and, in this context, the marine habitats and species associated with key fishing areas are generally of lower conservation value with relatively high recovery rates. Active fishing does not take place in the Port of Mostyn and the approaches as the area needs to be kept clear for navigation. The temporary, small and localised disturbance resulting from the activities associated with the MEPE Project is, therefore, not considered to result in significant cumulative effects with the disturbance effects from existing fishing activities. Overall, the potential for cumulative impacts through ongoing fishing activities on interest features of nature conservation sites and marine ecology receptors is considered to be negligible.</p> <p><b>Conclusion:</b>            Taking account of the potential impacts of the proposed development on nature conservation and marine ecology features (Chapter 8), and following the impact assessment methodology, the probability of occurrence of cumulative/in-combination effects on protected sites and features is considered to be high and the magnitude is considered to be small at worst. The exposure to change is therefore assessed as low. Overall, taking account of the sensitivity and importance of protected sites and features, the cumulative and/or in-combination effects are assessed on a worst case basis as <b>insignificant to minor adverse</b>.</p>
Fisheries	Other projects together with the proposed development, have the potential to result in cumulative/in-combination effects on fisheries.

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p><u>AyM OWF Project</u>                      The AyM OWF EIA concluded that the level of residual effect for all commercial fisheries receptors, including the potting, netting and dredging fleet, is either negligible or minor adverse and not significant for all phases of development. The potting, dredging and mobile gear fishing activity takes place offshore of the northern coast of Wales and therefore has no potential to interact with the changes brought about by the MEPE Project. There is a very low level of static gear fishing, including fixed and drift nets, that takes place in the outer part of the Dee Estuary and along the northern coast of Wales that could be influenced by both projects. However, the construction of the AyM Project is not anticipated to commence until 2026. There is, therefore, no potential overlap or interaction with the construction of the MEPE Project.</p> <p><u>Holyhead Deep Project</u>                      The Holyhead Deep Project is located over 100 km from the MEPE Project and will not result in any significant effects on fisheries during construction/installation, operation and maintenance. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><u>Holyhead Port Expansion Project</u>                      Potential impacts on commercial fish landings due to changes in stock availability and potential impacts on fishing activity due to increased vessel traffic due to the Holyhead Port Expansion Project are assessed as negligible. Furthermore, this project is located approximately 90 km from the MEPE Project and there will, therefore, be potential for cumulative and/or in-combination effects to occur on commercial fisheries receptors.</p> <p><u>Morlais Tidal Energy Project</u>                      The Morlais Tidal Energy Project is located approximately 90 km from the MEPE Project and will not result in any significant effects on commercial fisheries. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><b>Conclusion:</b>                      Taking account of the potential impacts of the proposed development on fisheries (Chapter 9), and following the impact assessment methodology, the probability of occurrence of cumulative/in-combination effects on fishing receptors is considered to be high and the magnitude is considered to be small. The exposure to change is therefore assessed as low. Overall, taking account of the sensitivity and importance of fishing receptors, the cumulative and/or in-combination effects are assessed on a worst case basis as <b>insignificant to minor adverse</b>.</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
<p>Commercial and recreational navigation</p>	<p>Other projects and ongoing activities, together with the proposed development, have the potential to result in cumulative/in-combination effects on commercial and recreational navigation.</p> <p><u>AyM OWF Project</u>                      The AyM OWF EIA concluded that the level of residual effect for all commercial and recreational navigation receptors is either broadly acceptable or tolerable within mitigation and not significant in EIA terms for all phases of development. The study area for the AyM Project is limited to the coastal and offshore area off the northern coast of Wales, outside the Dee Estuary. The potential effects on commercial and recreational navigation will, therefore, not spatially overlap with any effects brought about by the MEPE Project. Furthermore the construction of the AyM Project is not anticipated to commence until 2026. There is, therefore, no potential overlap with the construction of the MEPE Project.</p> <p><u>Holyhead Deep Project</u>                      The Holyhead Deep Project is located over 100 km from the MEPE Project and the potential effects on shipping and navigation during construction/installation, operation and maintenance are assessed as low (broadly acceptable) or a moderate (tolerable) risk with a series of standard industry measures. Project specific mitigation measures have been identified in order to reduce the frequency and consequence of any potential risks. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><u>Holyhead Port Expansion Project</u>                      Potential impacts on commercial and recreational navigation during the construction of the Holyhead Port Expansion Project are assessed as negligible with appropriate mitigation, including the publication of a Notice to Mariners, and frequent communication with the Harbour Master to ensure the vessel movements do not impede the progress of the ferries. Furthermore, this project is located approximately 90 km from the MEPE Project and there will, therefore, be no potential for cumulative and/or in-combination effects to occur on commercial and recreational navigation receptors.</p> <p><u>Morlais Tidal Energy Project</u>                      The risks to commercial and recreational vessels (including non-motorised such as kayaks) from the Morlais Tidal Energy Project are assessed as ALARP or lower and are considered acceptable or tolerable. Residual impacts on commercial and recreational vessels will be mitigated through deployment specific NRAs. Furthermore, this project is located approximately 90 km from the MEPE Project and there will, therefore, be no potential for cumulative and/or in-combination effects to occur on commercial and recreational navigation receptors.</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p><b>Conclusion:</b> Taking account of the potential impacts of the MEPE Project alone (Chapter 10) on commercial and recreational navigation, and following the impact assessment methodology, the probability of occurrence of cumulative/in-combination effects is considered to be low and the magnitude is considered to range between negligible and large depending on its consequence to people, environment and assets. The exposure to change is, therefore, assessed as negligible to low. Overall, taking account of the sensitivity of the receptors being moderate with the application of existing controls at the Port of Mostyn to manage navigational risks and the high importance of the receptors, the cumulative and/or in-combination effects are assessed as <b>insignificant to minor adverse</b>.</p>
<p>Flood risk and drainage</p>	<p>Other projects and ongoing activities, together with the proposed development, have the potential to result in cumulative/in-combination effects on flood risk and drainage.</p> <p><u>AyM OWF Project</u> The AyM OWF EIA concluded that the level of residual effect for all flood risk receptors is either negligible or minor adverse and not significant for all phases of development. The study area for the AyM Project is limited to a small coastal and inland section around the proposed onshore export cable corridor between Rhyl and Prestatyn in north Wales, over from the Dee Estuary. The potential effects on flood risk will, therefore, not spatially overlap with the flood risk effects brought about by the MEPE Project.</p> <p><u>Morlais Tidal Energy Project</u> The Morlais Tidal Energy Project is in line with national and local policy requirements regarding flood risk. The FCA provided a true reflection of the flood risks and demonstrated that these risks can be managed. Furthermore, this project is located approximately 90 km from the MEPE Project and there will, therefore, be no potential for cumulative and/or in-combination flood risk effects to occur.</p> <p><b>Conclusion:</b> Taking account of the potential impacts on flood risk and drainage of the MEPE Project alone (Chapter 11), and following the impact assessment methodology, the probability of occurrence of cumulative/in-combination effects is considered to be low and the magnitude of change is considered to be negligible to small. The exposure to change is, therefore, assessed as negligible. Overall, the cumulative and/or in-combination effects are assessed as <b>insignificant</b>.</p>
<p>Cultural heritage and marine archaeology</p>	<p>Other projects and ongoing activities, together with the proposed development, have the potential to result in cumulative/in-combination effects on flood risk and drainage.</p> <p><u>AyM OWF Project</u> The AyM OWF EIA concluded that the level of residual effect for all potential archaeological receptors is either negligible to minor adverse (not significant) or minor to major beneficial (not significant to significant) for all phases of development. The study area for</p>

Receptor/Topic	Summary of Predicted Cumulative and In-combination Effects
	<p>the AyM Project is over 15 km from the MEPE Project and, therefore, the potential effects on cultural heritage and marine archaeology of both project will not spatially overlap.</p> <p><u>Holyhead Deep Project</u>                      The Holyhead Deep Project is located over 100 km from the MEPE Project and will not result in any significant effects with the application of mitigation, including adherence to a Written Scheme of Investigation (WSI), on marine archaeology and cultural heritage during construction/installation, operation and maintenance. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><u>Morlais Tidal Energy Project</u>                      The Morlais Tidal Energy Project is located approximately 90 km from the MEPE Project and will not result in any significant effects with the application of an Archaeological Mitigation Strategy and a Protocol for Archaeological Discoveries, the identification of any Archaeological Exclusion Zones (AEZs) where no development related activities can occur and the requirement of a WSI for a staged programme of archaeological work. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><u>Regional Maintenance activities for RNLI stations</u>                      The proposed regional maintenance activities of the RNLI stations on the Dee Estuary, namely the Flint Lifeboat station and Connah’s Quay, are confined to the immediate footprint of the respective slipways and the immediate area of the associated beach re-profiling areas and, therefore, do not encroach on any nearby historic features, including Flint Castle, Connah’s Quay landing stage and Wharf III. Furthermore, the proposed works are maintenance works only and will not alter the current appearance of the slipways. There is, therefore, considered no potential for any significant cumulative and/or in-combination effects to occur.</p> <p><b>Conclusion:</b>                      Taking account of the potential impacts of the proposed development on marine archaeology of the MEPE Project alone (Chapter 12), and following the impact assessment methodology, the probability of occurrence of cumulative/in-combination effects on cultural heritage and marine archaeology features is considered to be low and the magnitude is considered to be negligible with the mitigation measures in place. The exposure to change is, therefore, assessed as negligible. Overall, the cumulative and/or in-combination effects are assessed as <b>insignificant</b>.</p>

## 13.8 Mitigation and residual effects

The MEPE Project does not have the potential to result in significant cumulative effects either alone or with and/or in-combination with other plans, project and activities. As a consequence, mitigation measures are not required to minimise and/or avoid significant effects beyond those already identified for the project alone.

## 13.9 Summary

This section reports the assessment of potential cumulative and in-combination effects as a result of the proposed development. A summary of the impact pathways that have been assessed is presented in Table 13.5.

**Table 13.5. Summary of potential cumulative and/or in-combination impacts, mitigation measures and residual impacts**

Impact Pathway	Impact Significance	Mitigation Measures	Residual Impact	Confidence
Proposed works alone (intra-project effects) on water and sediment quality	Insignificant to minor adverse	N/A	Insignificant to minor adverse	Medium
Proposed works alone (intra-project effects) on benthic habitats and species	Insignificant to minor adverse	N/A	Insignificant to minor adverse	Medium
Proposed works alone (intra-project effects) on fish and shellfish	Insignificant to minor adverse	N/A	Insignificant to minor adverse	Medium
Proposed works alone (intra-project effects) on coastal waterbirds	Minor adverse	N/A	Minor adverse	Medium
Proposed works alone (intra-project effects) on fisheries	Insignificant to minor adverse	N/A	Insignificant to minor adverse	Medium
Proposed works alone (intra-project effects) on people and/or assets	Insignificant to minor adverse	N/A	Insignificant to minor adverse	Medium
Other plan, projects and activities (inter-project effects)	Insignificant to minor adverse	N/A	Insignificant to minor adverse	Medium

## 13.10 References

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## 13.11 Abbreviations/Acronyms

AA	Appropriate Assessment
ADD	Acoustic Deterrent Device
AEOI	Adverse Effect On the Integrity
AEZ	Archaeological Exclusion Zone
ALARP	As Low As Reasonably Practicable
AONB	Area of Outstanding Natural Beauty
CCS	Carbon Capture and Storage
CD	Chart Datum
CEMP	Construction Environmental Management Plan

CO <sub>2</sub>	Carbon dioxide
CTV	Crew Transfer Vessels
DCO	Development Consent Order
DGU	Deep Green Unit
DP	Dynamic Positioning
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
EMMP	Environmental Mitigation and Monitoring Plan
ES	Environmental Statement
FCA	Flood Consequence Assessment
FLDP	Flintshire Local Development Plan
GW	Gigawatt
HM	His Majesty's
HMO	Houses in Multiple Occupation
HMSO	Her Majesty's Stationary Office
HRA	Habitats Regulations Assessment
INNS	Invasive Non-Native Species
LSE	Likely Significant Effect
MDZ	Morlais Demonstration Zone
MEP	Mostyn Energy Park
MEPE	Mostyn Energy Park Extension
MHWS	Mean High Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMMU	Marine Mammal Management Unit
MPS	Marine Policy Statement
MW	Megawatt
N/A	Not Applicable
NMFS	National Marine Fisheries Service
NPSfP	National Policy Statement for Ports
NOAA	National Oceanic and Atmospheric Administration
NRW	Natural Resources Wales
O&M	Operation and Maintenance
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OWF	Offshore Wind Farm
PINS	Planning Inspectorate
PPE	Personal Protective Equipment
PPMP	Pollution Prevention and Management Plan
PTS	Permanent Threshold Shift
Q	Quarter
Ramsar	Wetlands of international importance, designated under The Convention on Wetlands (Ramsar, Iran, 1971)
RNLI	Royal National Lifeboat Institution
SAC	Special Area Conservation
SMNR	Sustainable Management of Natural Resources
SMS	Safety Management System
SPA	Special Protection Area
SSC	Suspended Sediment Concentrations
SSSI	Site of Special Scientific Interest
UK	United Kingdom
UXO	Unexploded Ordnance

WFD	Water Framework Directive
WNMP	Welsh National Marine Plan
WSI	Written Scheme of Investigation
ZoI	Zone of Influence

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

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