Port of Mostyn

Mostyn Energy Park Extension

Environmental Statement

Chapter 5: Impact Assessment Approach

December 2022





Innovative Thinking - Sustainable Solutions

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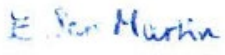		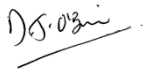

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5.1 Introduction

This chapter presents the outcome of the scoping phase of the EIA. It also details the impact assessment methodology that has been followed in this ES in order to identify and assess the significant environmental effects likely to be generated by the Mostyn Energy Park Extension (MEPE) Project. Each individual topic assessment chapter (Chapters 6 to 13) includes a description of the specific assessment methodology that has been applied to the EIA.

5.2 Scope of assessment

5.2.1 Scoping

An application for a scoping opinion was made to the NRW in October 2021 to confirm the scope of the EIA for the proposed development (ABPmer, 2021). Comments received from NRW that apply generally to the EIA or relate to topics that can be scoped out of the EIA are included in Table 5.1. Specific comments relating to a particular topic scoped into the assessment are covered in the respective EIA topic chapters (Chapters 6 to 13 of the ES).

Table 5.1. Scoping comments and actions undertaken in ES

Comment ref	Comment	Action or Response	Chapter or Section of the ES
General comments, 0.1	Marine and coastal guidance produced by NRW that may provide useful information to help with your project is available here: https://naturalresources.wales/guidance-and-advice/business-sectors/marine/?lang=en	The guidance has been reviewed and taken account of in the preparation of the EIA.	All
General comments, 0.2	The ES submitted should demonstrate consideration of the points raised in this scoping opinion. It is recommended that a table is provided in the ES summarising the scoping opinion comments and how they are addressed in the ES.	Scoping opinion comments that apply generally to the EIA or relate to topics that can be scoped out of the EIA are included in this table. Specific comments relating to a particular topic scoped into the assessment are covered in the respective EIA topic chapters.	6.4, 7.4, 8.4, 9.4, 10.4, 11.4, 12.4, 13.4
General comments, 0.3	The EIA must be undertaken by a competent person and the ES must include a competent expert statement.	Competent expert statements from the EIA project team are included in the ES.	1.3
General comments, 0.4	Where possible, other environmental assessments should be coordinated with the EIA process. However, it is important to note that the Habitats Regulations Assessment (HRA) and Water Framework Directive assessment (WFD), and any other assessment, are separate processes to the EIA.	Separate assessments to the EIA, including the HRA and WFD assessment, are included as appendices to the ES.	4.8
General comments, 0.5	Throughout the ES robust evidence should be presented so that the potential environmental impacts can be properly understood and evaluated; and appropriate measures identified to avoid, reduce or where necessary compensate for those impacts.	The impact assessment methodology that has been applied to this EIA follows this approach.	5.3, 6.3, 7.3, 8.3, 9.3, 10.3, 11.3, 12.3, 13.3
General comments, 0.6	The ES must include: ▪ A Non-Technical Summary (NTS);	An NTS has been drafted and is included in the ES.	Standalone NTS
	▪ A chart or map identifying where the activity will be carried out;	A figure showing the location of the proposed development is included in the ES.	1.1

Comment ref	Comment	Action or Response	Chapter or Section of the ES
	▪ A description of the likely significant effects of the project, whether direct, indirect, secondary, cumulative, transboundary, short-term, medium-term, long-term, permanent, temporary, positive and negative;	The likely significant effects of the project are assessed in each of the EIA topic chapters.	6.7, 7.7, 8.7, 9.7, 10.7, 11.7, 12.7, 13.7
	▪ A description of the methods used to make the assessment of the significant effects and difficulties encountered in compiling the information and uncertainties involved;	The impact assessment methodology that has been followed in this ES is included in this chapter. Certain EIA topics have a specific impact assessment methodology that follows recognised best-practice procedures. In these instances, topic-specific methodologies have been applied and these are described where relevant in the individual topic ES chapters.	5.3, 6.3, 7.3, 8.3, 9.3, 10.3, 11.3, 12.3, 13.3
	▪ A description of measures to avoid, prevent, reduce or offset identified significant adverse effects and proposed monitoring arrangements;	The mitigation and/or monitoring measures that have been identified as part of the EIA are described in each EIA topic chapter.	6.8, 7.8, 8.8, 9.8, 10.8, 11.8, 12.8, 13.8
	▪ A description of the expected significant adverse effects of the project on the environment resulting from the vulnerability of the project to risks of major accidents or disasters.	The potential risk of major accidents or disasters are considered in each of the EIA topic chapters.	6.7, 7.7, 8.7, 9.7, 10.7, 11.7, 12.7, 13.7
General comments, 0.7	The ES must consider any potential transboundary impacts where appropriate.	Given the predicted localised effects of the proposed development and the large distance between the study area and the next nearest Member State, there is considered to be no potential for transboundary impacts to occur on the majority of receptors. However, taking a precautionary view, the operational vessel movements associated with the MEPE Project, combined with the overlap of the proposed development with European/Ramsar sites, could lead to potential impacts on marine mammal and	Appendix 8.5

Comment ref	Comment	Action or Response	Chapter or Section of the ES
		bird populations associated with European Economic Area (EEA) States. These potential transboundary effects have been considered in more detail in the HRA.	
General comments, 0.8	Early engagement with relevant stakeholders is encouraged. You are able to obtain further advice from NRW through the NRW Discretionary Advice Service	Further details of the consultation that has been undertaken is included in this chapter and the respective EIA topic chapters.	5.2.2, 6.4, 7.4, 8.4, 9.4, 10.4, 11.4, 12.4, 13.4
General comments, 0.9	The UK left the EU on 31 January 2020 – all legal obligations relating to compliance with environmental licences/permits and legislation will continue to apply. NRW on behalf of Welsh Ministers will continue to issue licenses in line with our current practice.	Noted. Further details of the implications of the UK leaving the EU and the legislative and consenting framework for the proposed development is included in the ES.	4
General comments, 0.10	You must ensure that reference is made to and consideration of compliance with the UK Marine Policy Statement and the now published Welsh National Marine Plan and its associated policies within the submitted ES, alongside any further regional planning documentation. The published Welsh National Marine Plan can be found here: Welsh National Marine Plan: document | GOV.WALES Implementation guidance for the Welsh National Marine Plan can also be found here: https://gov.wales/welsh-national-marine-plan-implementation-guidance.	The ES includes a review of the key policy context applicable to the MEPE Project and identifies some of the main considerations that will be material to the decision-making process. This includes a review the UK MPS and the WNMP. In addition, a marine plan conformance assessment has been undertaken and is included as an appendix to the ES.	4.8.2, 4.9, Appendix 4.1
1. NTS, 1.1	As identified within the Scoping report (Table 2), the ES must include a Non-Technical Summary (NTS).	An NTS has been drafted and is included in the ES.	Standalone NTS
2. Introduction and Project Description, 2.1	You must ensure that the submitted ES fully clarifies the timescales for all Project stages and therefore ensure that the timeline being assessed is clear.	The timescales for the proposed development on which the assessment is based on are presented in the ES.	3.1

Comment ref	Comment	Action or Response	Chapter or Section of the ES
2. Introduction and Project Description, 2.2	An overall figure to understand the estuary scale, particularly the outer estuary distances offshore, would also be useful to provide context.	A figure showing entire estuary scale is included in the ES.	1.1
3. Legislation and Consenting Framework, 3.1	We are satisfied that the scoping report comprehensively identifies the relevant policy and legislation which must be considered within the ES.	The relevant policy and legislation is reviewed in detail in the Legislation and Consenting Framework Chapter and respective EIA topic chapters.	4, 6.5, 7.5, 8.5, 9.5, 10.5, 11.5, 12.5, 13.5
3. Legislation and Consenting Framework, 3.2	The requirement for a Habitats Regulation Assessment (HRA) and Water Framework Directive (WFD) assessment are correctly identified.	Further details regarding the relevant assessment requirements for the proposed development, including the HRA and WFD assessment, are provided in the ES.	4.8
3. Legislation and Consenting Framework, 3.3	Section 3.2 (Seabed Owner Consent), and Figure 4 (Pg. 8) of the scoping report shows a landownership boundary. NRW as the Statutory Harbour Authority for the Dee Conservancy own the surrounding riverbed and foreshore and expect the Project to consider potential localised impacts on its neighbours. Whilst the proposed port extension work is contained with the Port Harbour jurisdiction and freehold, the wider maintenance dredge area in the Mostyn Operational Area does incorporate Dee Conservancy riverbed. A management system exists for the survey and dredge of the channel in the Mostyn Operational Area, with over sight from the Dee Conservancy Harbour Master.	The relevant seabed owners in relation to different elements of the proposed development are identified in the Legislative and Consenting Framework Chapter of the ES.	4.2
3. Legislation and Consenting Framework, 3.4	A protected species licence (section 3.7) may be required depending upon the outcome of the EIA.	The need for a protected species licence is reviewed in the ES.	4.7
3. Legislation and Consenting Framework, 3.5	As noted within the scoping report (section 3.9); you must ensure the submitted ES makes reference to and considers any impacts under the Wellbeing of Future Generations (Wales) Act 2015 and complies with the UK Marine Policy Statement, the Welsh National	The ES includes a review of the key policy context applicable to the MEPE Project and identifies some of the main considerations that will be material to the decision-making process. This includes a review the Wellbeing of Future Generations (Wales) Act	4.8.2, 4.9, Appendix 4.1

Comment ref	Comment	Action or Response	Chapter or Section of the ES
	Marine Plan (and its associated policies) (refer paragraph 0.10 above), alongside any further regional planning documentation.	2015, the UK MPS and the Welsh National Marine Plan. In addition, a marine plan conformance assessment has been undertaken and is included as an appendix to the ES.	
3. Legislation and Consenting Framework, 3.6	In reference to section 3.8.6 (waste hierarchy assessment); please note that sediment retention is regarded as a preferred management option in relation to dredged material if it is environmentally, technically, socially, and economically feasible to do so (see section 5.2 Physical processes below and Annex 1). This approach is advocated within the Welsh National Marine Plan D&D_01: Dredging and Disposal (supporting) policy and within the OSPAR Guidelines for the Management of Dredged Material at Sea (Agreement 2014-06). Recognition of the importance of dredged sediment to the natural sediment cycle is the driving force behind this approach. The following reference may be useful: Manning, W.D., Scott, C.R and Leegwater. E. (eds) (2021). Restoring Estuarine and Coastal Habitats with Dredged Sediment: A Handbook. Environment Agency, Bristol, UK. Restoring-Coastal-Habitats_V8.pdf (catchmentbasedapproach.org)	A WHA has been prepared to determine BPEO for dealing with the dredge arisings and is included as an appendix to the ES. This gives consideration to retaining dredged sediment in the estuary as well as other waste management options that are ranked on the waste hierarchy.	4.8.5, Appendix 6.1
4. Proposed EIA Methodology, 4.1	We consider the proposed methodology for the EIA (as detailed within Section 4) to be appropriate. However, we would recommend that the parameters of the Project are assessed using a 'realistic worst-case scenario' to address any uncertainty relating to Project design.	The assessment of impacts is based on a realistic worst-case scenario to address any potential uncertainty in the scheme design at this stage. The parameters and assumptions that form the basis of the assessment are detailed in the Project Methodology Chapter (Chapter 3) and relevant EIA topic chapters.	3, 5.3, 6.7, 7.7, 8.7, 9.7, 10.7, 11.7, 12.7, 13.7

Comment ref	Comment	Action or Response	Chapter or Section of the ES
4. Proposed EIA Methodology, 4.2	All impacts on nature conservation interests must be fully described, assessed and the significance of impacts clearly explained in the ES. The mitigation hierarchy should be followed to avoid, mitigate or compensate for biodiversity losses.	The impact assessment methodology that is described in this chapter follows this approach. Certain EIA topics have a specific impact assessment methodology that follows recognised best-practice procedures. In these instances, topic-specific methodologies have been applied and these are described where relevant in the individual topic ES chapters.	5.3, 6.3, 7.3, 8.3, 9.3, 10.3, 11.3, 12.3, 13.3
	All impacts predicted should include fully worked up possible mitigation within the ES. Where applicable, monitoring should be utilised to verify predictions of impact significance and quantify any unexpected impacts.	The mitigation and/or monitoring measures that have been identified as part of the EIA are described in each EIA topic chapter.	6.8, 7.8, 8.8, 9.8, 10.8, 11.8, 12.8, 13.8
5.1 Key issues and approach to scoping	We generally agree with the topics that the report has scoped into the EIA. We have provided specific comment below. Where no comment has been provided the assessment should be carried out as detailed within the scoping report.	Comments received from NRW that relate to a particular topic that has been scoped into the assessment are covered in the respective EIA topic chapters.	6.4, 7.4, 8.4, 9.4, 10.4, 11.4, 12.4 and 13.4
Other topics	No comments were received from consultees in relation to the following topics of the scoping report and therefore the assessment should be carried out as detailed within the report: • Air Quality • Climate • Geology and Soils • Landscape and Visuals • Materials and Waste • Population and Health • Traffic, Transport and Access	Noted.	NA

Comment ref	Comment	Action or Response	Chapter or Section of the ES
Traffic, Transport and Access	The ES should include an assessment of the impacts on Traffic, Transport and Access if the materials to construct the new Port area are to be transported by road rather than vessel and this elevates the traffic levels above the threshold limit presented.	The traffic levels will not exceed the 30 % threshold figure provided in the IEMA (1993) Guidance and therefore this topic has been scoped out of the assessment.	5.2.3
Terrestrial Ecology	We also do not agree with Terrestrial ecology being scoped out at this stage, without further evidence, due to the presence of Otter (*Lutra lutra*) within the Dee Estuary and the potential for disturbance from the construction phase (airborne noise, lighting, movements of plant and personnel etc).	Further advice from NRW on the consideration of otter was sought. An assessment of the potential effects of the proposed development on otter is included in the Nature Conservation and Marine Ecology ES Chapter.	8
Other topics	We agree that landscape and visual impacts and air quality can be scoped out at this stage based upon the information presented within the scoping report	Noted.	5.2.3
General	Please note our scoping opinion is based on the information available to us at this time. The information provided is not a definitive list of the ES / EIA requirements and further information may be required following an application for this project, to ensure a full assessment is carried out.	Engagement with relevant stakeholders, including NRW Advisory and the Marine Licensing Team, has been undertaken to ensure that they are kept updated and that any issues can be discussed and addressed. Further details of the consultation that has been undertaken is included in this chapter and the respective EIA topic chapters.	5.2.2, 6.4, 7.4, 8.4, 9.4, 10.4, 11.4, 12.4 and 13.4
NA – Not Applicable			

5.2.2 Consultation

Consultation is a crucial part of the assessment process. This is being led by NRW to seek the views of statutory consultees and any other non-statutory consultees that NRW consider may be impacted by the proposed development. These consultees are expected to include the following parties:

- Cadw;
- Chamber of Shipping;
- Environment Agency;
- Local Authority – Biodiversity – Flintshire;
- Local Harbour Authorities (in this case including the Dee Conservancy);
- Local Planning Authority – Flintshire;
- Maritime and Coastguard Agency (MCA);
- Ministry of Defence;
- Natural England;
- North West Inshore Fisheries and Conservation Authority;
- NRW Advisory;
- NRW Cockle Officers;
- Royal Commission on the Ancient and Historical Monuments of Wales;
- Royal Society for the Protection of Birds;
- Royal Yachting Association;
- The Crown Estate;
- Trinity House;
- Welsh Archaeological Trust; and
- Welsh Fisherman Association.

The Port of Mostyn has held a number of meetings with key stakeholders. The main purpose and outcomes of these meetings are summarised in Table 5.2.

Table 5.2. Summary of consultation meetings and telephone discussions undertaken to date

Consultee	Date	Key Purpose and Outcome
NRW Marine Licensing Team	08/07/2021	▪ Introduce the MEPE Project; ▪ Agree the consenting approach; and ▪ Present timelines for the proposed development.
NRW Advisory	20/08/2021	▪ Introduce the MEPE Project; ▪ Present the scope of the assessment; ▪ Discuss the scope of the marine surveys; ▪ Agree level of engagement and lines of communication; and ▪ Present timelines for the proposed development.
NRW Advisory	11/10/2021	▪ Provide project update; ▪ Provide an update on the progress made on the EIA; ▪ Present an update on the marine surveys; and ▪ Present updated programme for the proposed development.
NRW Advisory	21/04/2022	▪ Provide project update; ▪ Review scoping opinion from NRW; ▪ Confirm updated scope of assessment; ▪ Present an update on the marine surveys; and ▪ Present revised programme for the proposed development.

Consultee	Date	Key Purpose and Outcome
NRW Marine Licensing Team	29/04/2022	▪ Provide project update; ▪ Review scoping opinion from NRW; ▪ Confirm updated scope of assessment; ▪ Present an update on the marine surveys; and ▪ Present revised programme for the proposed development.
NRW Senior Marine Advisor	29/04/2022	▪ To discuss fisheries in the Dee Estuary.
NRW Senior Marine Advisor	20/5/2022	▪ Confirm the need to consider otter in the EIA and HRA given records of their presence within the Dee Estuary; and ▪ Agree scope and approach to assessment of otter.

It has been agreed with the Port of Mostyn as the SHA that other stakeholders with a navigational interest will be consulted on the NRA presented in Chapter 10 during the marine licence consultation period. This will include authorities such as the Dee Conservancy Harbour Master, the MCA and Trinity House.

Additional consultation with key parties has also been carried out to obtain baseline information and further advice on the environmental assessments (e.g. confirming survey methodologies) in support of the applications for the MEPE Project where required. This consultation is detailed within each individual ES topic chapter.

5.2.3 Final ES scope

Based on expert judgement and feedback provided by NRW in their Scoping Opinion, the following EIA topics or receptors have the potential to be affected by the proposed development and have been scoped into this ES:

- Physical processes;
- Water and sediment quality;
- Nature conservation and marine ecology[1];
- Fisheries;
- Commercial and recreational navigation;
- Flood risk and drainage;
- Cultural heritage and marine archaeology; and
- Cumulative and in-combination effects

The above EIA topics or receptors are assessed in Chapters 6 to 13 of this ES.

The Transboundary Regulation 17 of the Marine Works EIA Regulations has not been considered in the impact assessment due to the predicted localised effects of the proposed development and the large distance between the study area and the next nearest Member State, the Republic of Ireland, which is over 180 km away.

A number of topics/receptors have been scoped out and not specifically assessed in detail in this ES. The rationale for not undertaking further assessment is presented in Table 5.3.

[1] Including otter given it has been recorded within the Dee Estuary.

Table 5.3. Topics or receptors scoped out of the ES

Topic or Receptor	Justification
Terrestrial ecology	The proposed development will take place below MHWS and within the marine environment. The landside works relate to the reclamation of an area of the harbour seabed adjacent to the existing operational quayside which will become hardstanding and an additional laydown/storage area once the site is operational (Project Methodology Chapter 3). There will, therefore, be no potential effect on terrestrial ecology habitats and species and this topic has been scoped out of the EIA. Following further advice from NRW, it has been agreed that this topic can be scoped out of detailed assessment in the EIA. NRW has advised that there are records of otter within the Dee Estuary (Section 5.2.1). Although, otter is a terrestrial/freshwater species, the potential impacts of the proposed development on this feature has been assessed in the Nature Conservation and Marine Ecology ES Chapter 8 given its links to the estuarine and marine environment in the context of this particular project.
Traffic and transport	The main potential transport impacts during the construction phase of the proposed development are envisaged to be associated with temporary changes in traffic flows along the existing road network (A548). The overall percentage change in traffic movements are anticipated to be less than 5 % and will therefore not exceed the 30 % threshold figure provided in the IEMA (1993) Guidance. The construction work will occur on a temporary basis and can be adequately accommodated without any significant environmental traffic impacts. The traffic impact associated with the assembly of the offshore wind turbines during operation is anticipated to be minimal given that the construction material is anticipated to be delivered by sea. The percentage increase in overall vehicle movements on the existing road transport network, including the A548, relating to the labour trips associated the future operation and maintenance of offshore wind farms is expected to be less than 5 % of existing movements and is, therefore, not expected to exceed the 30 % threshold figure provided in the IEMA Guidance. In impact terms, the traffic impacts as set out in the IEMA (1993) Guidance include severance, driver delay, pedestrian delay and amenity, accidents and safety, fear and intimidation and hazardous loads. Based on the small percentage increase in traffic that is anticipated, the impacts are unlikely to be significant. NRW, in their Scoping Opinion (see Table 5.1), agree that this topic can be scoped out of the EIA.
Air quality and greenhouse gas emissions	Any changes in local air quality associated with the operation of the construction plant during construction are considered to be temporary and negligible in scale. The number of additional vessel movements during construction works is, also anticipated to be minimal, particularly considering the existing operational use of the port facility. Significant air quality impacts are not, therefore, envisaged during construction.

Topic or Receptor	Justification
	Defra's Local Air Quality Management LAQM Technical Guidance (TG16) (Defra, 2018) provides screening criteria to determine whether emissions from shipping operations require quantitative assessment. This guidance advises that the assessment of vessel emissions is likely to be necessary for port extensions where: ▪ There are more than 5,000 large ship movements per year, with relevant exposure within 250 m of the shipping berths and main areas of manoeuvring; or ▪ There are more than 15,000 large shipping movements per year, with relevant exposure within 1 km of the port / shipping area. The total number of vessel movements when the MEPE Project is operating at peak capacity is anticipated to be less than 5,000 per year. The contribution of emissions from vessels to local air quality is, therefore, not considered be significant. NRW, in their Scoping Opinion (see Table 5.1), agree that this topic can be scoped out of the EIA.
Airborne noise and vibration	The main potential source of construction noise and vibration will be works related to the construction of the new quay wall which will involve piling works and a small infill behind the new structure. Negligible levels of airborne noise will also be generated by the proposed dredging works. The nearest existing sensitive human receptor to the proposed development is located *circa* 670 m away, to the southwest of the MEPE Project, 4 m from the carriageway of the A548, representative of the Quay House, nearby residence and other nearby dwellings. Given the distance from the nearest human receptor, the temporary nature of construction activities, and the existing levels of noise associated with the adjacent A548, any airborne noise and vibration impacts are unlikely to be significant. Once operational, the main sources of noise associated with the proposed development will be from site activities, including vessel movements, which will be very low and non-intrusive. The use of the site for the MEPE Project will be similar to the existing and surrounding land uses, therefore, any effects are not likely to be significant. NRW, in their Scoping Opinion (see Table 5.1), agree that this topic can be scoped out of the EIA.
Landscape/seascape and visual impact	Due to the current port related and industrial character of the site and its existing use as part of a wider operational port, it is considered that the landscape and visual effects generated by the MEPE Project will be limited and not result in any significant effects. The proposed works will allow for larger sized vessels to be accommodated along the new quay wall. However, these vessels will be of a similar character to those that are already regular visitors at the port facility and thus any changes are unlikely to be perceptible. The proposed dredging and disposal works will be temporary and similar in character to the use of the existing berths, harbour, main navigation channel

Topic or Receptor	Justification
	and sea disposal sites. Given the high level of existing vessel activity and operations at the Port of Mostyn and the temporary nature of the proposed dredging and disposal activities, there will be no change to the landscape/seascape character or visual appearance. NRW, in their Scoping Opinion (see Table 5.1), agree that this topic can be scoped out of the EIA.

5.3 Impact assessment methodology

To facilitate the impact assessment process and ensure consistency in the terminology of significance, a standard assessment methodology has been applied where possible. This methodology has been developed from a range of sources, including the Marine Works EIA Regulations, the EIA Directive (2014/52/EU), statutory and non-statutory guidance, consultations and ABPmer's previous (extensive) EIA project experience. ABPmer has an IEMA Quality Mark, demonstrating a commitment to excellence in leading the co-ordination of statutory EIAs in the UK. The ES has also followed the principles of relevant guidance, including the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines for ecological impact assessment in the UK and Ireland (which consolidate advice for terrestrial, freshwater and coastal environments) (CIEEM, 2018) and Institute of Environmental Management and Assessment (IEMA) guidelines (IEMA, 2016).

It should be noted that the commercial and recreational navigation topic has a specific impact assessment methodology (for NRAs) that follows published guidance and industry standards. This topic-specific methodology is described in the Commercial and Recreational Navigation Chapter 10.

For consistency and transparency, each topic assessment chapter of this ES has been written to include the following general common elements:

- Introduction;
- Definition of the study area;
- Impact assessment methodology;
- Consultation;
- Implications of legislation, policy and guidance;
- Description of the existing environment;
- Future baseline environment;
- Impact assessment;
- Mitigation and residual impacts;
- Summary of impacts; and
- References.

The environmental issues are divided into distinct 'receiving environments' or 'receptors'. The effect of the proposed development on each of the environmental receptors has been assessed by describing in turn: the baseline environmental conditions of each receiving environment; the 'impact pathways' by which the receptors could be affected; the significance of the impacts occurring; and the measures to mitigate for significant adverse impacts where these are predicted. In accordance with CIEEM (2018), an impact is defined as an action resulting in changes to a receptor (e.g. construction activities resulting in the direct loss of benthic habitat), and an effect is the outcome to the receptor from an impact (e.g. the effects on fish from the loss of benthic habitat).

This impact assessment methodology, which is presented in the following sections, is designed to incorporate the key criteria and considerations without being overly prescriptive.

5.3.1 Stage 1 – Identify receptors and changes

The first stage identifies the potential environmental changes resulting from the proposed activity and the features of interest (receptors) that are likely to be affected (which are together referred to as the impact pathway). The potential impact pathways which are considered relevant to this EIA are set out within each topic-specific assessment chapter.

5.3.2 Stage 2 – Understand change and sensitivity

The second stage involves understanding the nature of the environmental changes to provide a benchmark against which the changes and levels of exposure can be compared. The scale of the impacts via the impact pathways depends upon a range of factors, including the following:

- Magnitude (local/strategic):
  - Spatial extent (small/large scale);
  - Duration (temporary/short/intermediate/long-term);
  - Frequency (routine/intermittent/occasional/rare);
  - Reversibility;
- Probability of occurrence;
- The margins by which set values are exceeded (e.g. water quality standards);
- The baseline conditions of the system;
- Existing long-term trends and natural variability;
- The sensitivity of the receptor (resistance/adaptability/recoverability);
- The importance of the receptor (e.g. designated habitats and protected species); and
- Confidence, or certainty, in the impact prediction.

5.3.3 Stage 3 – Impact assessment

To assess the significance of effects, the magnitude of the impact pathway and the probability of it occurring is evaluated to understand the exposure to change, and this is assessed against the sensitivity of a receptor/feature to understand its vulnerability. Finally, this is compared against the importance of a receptor/feature to generate a level of significance for effects resulting from each impact pathway. This is summarised in the following sections.

The key significance levels for either beneficial or adverse impacts are described as follows:

1. Insignificant: Change not having a discernible effect;
2. Minor: Change is discernible but tolerable and not significant;
3. Moderate: Change is significant and if adverse, is likely to require mitigation; and
4. Major: Change is highest in magnitude, and the receptor has a high vulnerability and importance. Change is significant and if adverse, will require mitigation.

To ensure transparency in the impact assessment, it is important to make clear the evidence-based or value-based judgments used at each stage of the assessment, and how they have been attributed to a level of significance. This has been presented in the impact assessment for each impact pathway.

Impact assessment guidance tables

The matrices in Table 5.4 to Table 5.6 have been used to help assess significance (see below). Table 5.4 has been used as a means of generating an estimate of exposure to change for each impact pathway. Magnitude of change needs to be considered in spatial and temporal terms (including duration, frequency and seasonality), and against the background environmental conditions in a study area. Once

a magnitude has been assessed, this should be combined with the probability of occurrence to arrive at an exposure score which can then be used for the next step of the assessment, which is detailed in Table 5.5. For example, an impact pathway with a medium magnitude of change and a high probability of occurrence would result in a medium exposure to change.

Table 5.4. Exposure to change, combining magnitude and probability of change

Probability of Occurrence	Magnitude of Change			
	Large	Medium	Small	Negligible
High	High	Medium	Low	Negligible
Medium	Medium	Medium/Low	Low /Negligible	Negligible
Low	Low	Low /Negligible	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Table 5.5 has then been used to score the vulnerability of the features/receptors of interest based on the sensitivity of those features and their exposure to a given change. Where the exposure and sensitivity characteristics overlap then vulnerability exists, and an adverse effect may occur. For example, if the impact pathway previously assessed with a medium exposure to change acted on a receptor which had a high sensitivity, this would result in an assessment of high vulnerability. Sensitivity can be described as the intolerance of a receptor to an environmental change and essentially considers the response characteristic of the receptor. Thus, if a single or combination of environmental changes is likely to elicit a response then the receptor under assessment can be considered to be sensitive. Where an exposure or change occurs for which the receptor is not sensitive, then no vulnerability can occur. Similarly, vulnerability is always 'none' no matter how sensitive the feature is, if the exposure to change had been assessed as 'negligible'.

Table 5.5. Estimation of vulnerability based on sensitivity and exposure to change

Sensitivity of Feature	Exposure to Change			
	High	Medium	Low	Negligible
High	High	High	Moderate	None
Moderate	High	Moderate	Low	None
Low	Moderate	Low	Low	None
None	None	None	None	None

The vulnerability has then been combined with the importance of the feature of interest using Table 5.6 to generate an initial level of significance. The importance of a feature is based on its value and rarity (e.g. to either ecosystem or economy), such as the levels of protection, whilst recognising that importance should be determined having regard to geographic context (i.e. international/European, national, regional, and local). For an example of estimating significance, if a high vulnerability was previously given to a feature of low importance, an initial level of significance of minor would be given.

Table 5.6. Estimation of significance based on vulnerability and importance

Importance of Feature	Vulnerability of Feature to Impact			
	High	Moderate	Low	None
High	Major	Moderate	Minor	Insignificant
Moderate	Moderate	Moderate/Minor	Minor/Insignificant	Insignificant
Low	Minor	Minor/Insignificant	Insignificant	Insignificant
None	Insignificant	Insignificant	Insignificant	Insignificant

5.3.4 Stage 4 – Impact management (mitigation)

The final stage is to identify any impacts that are found to be significant (i.e. moderate and/or major adverse) and require mitigation measures to reduce residual impacts, as far as possible, to environmentally acceptable levels. Within the assessment procedure the use of mitigation measures 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 considered throughout the EIA process can take three forms (IEMA, 2016):

- **Primary (inherent)** – modifications to the location or design of the development made during the pre-application phase that are an inherent (or embedded) part of the project. These are captured and taken account of in the initial impact assessment;
- **Secondary (foreseeable)** – actions that will require further activity in order to achieve the anticipated outcome (identified as necessary through the assessment process). Within the impact assessment process, the use of secondary mitigation measures 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; and
- **Tertiary (inexorable)** – actions that would occur with or without input from an environmental impact assessment process, including actions that will be undertaken to meet other existing legislative requirements, or actions considered to be standard practices to manage commonly occurring environmental effects. These are captured and taken account of in the initial impact assessment.

In addition, it is appropriate to adopt a mitigation hierarchy which, from the CIEEM (2018) guidance[2] on ecological impact assessment specifically, can be summarised as follows:

- Seek to adopt options that **avoid** harm in the first instance;
- Identify ways to **minimise** adverse effects that cannot be completely avoided;
- Undertake **compensation** where there are significant residual adverse effects despite the mitigation proposed; and
- Provide **net benefits** (for biodiversity) above requirements for avoidance, mitigation or compensation.

In instances, a decision may need to be taken despite residual uncertainty about the effects. In such cases, adaptive management, linked to a bespoke monitoring programme, is a well-established and recommended way of ensuring that any negative impacts or effects are addressed in the course of the development and during the subsequent operational phase.

5.3.5 Confidence assessment

Following the significance assessment, a confidence assessment has been undertaken which recognises the degree of interpretation and expert judgement applied. This is presented in the summary table contained within the conclusions section of each impact assessment section. Confidence has been assessed on a scale incorporating three values: low, medium and high.

[2] Adapted from Royal Town Planning Institute (RTPI) (2000) *Planning for Biodiversity* (out of print) as used in the emerging CIEEM guidance

5.3.6 Cumulative impact and in-combination assessment

Under the Marine Works EIA Regulations it is necessary to assess the potential cumulative impacts of a proposed activity on all environmental receptors together with other existing or approved developments in the area. Under the Habitats Regulations, it is also necessary to consider the in-combination effects of a development proposal specifically on the interest features of European/Ramsar sites.

The 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 become significant.

The cumulative and in-combination assessment is presented in Chapter 13. This has been undertaken following the advice provided by NRW in their Scoping Opinion on the required scope of the assessment and also the data sources that might provide useful information on other projects.

5.4 Study area

The scope of the study area to be considered has been defined on the basis of the current proposed design for the proposed development. The study area has also taken into account the spatial and temporal extent (zone of influence) of the likely significant effects that could arise from the proposed development, their importance in a geographical context, as well as the sensitivities of the relevant topics/receptors. Areas outside the range of any potential impacts are representative of the wider natural environment and form part of the wider study area.

The assessment of impacts is based on a realistic worst-case scenario to address any potential uncertainty in the scheme design at this stage. The parameters and assumptions that form the basis of the assessment are detailed in the relevant EIA topic chapters.

A study area has been defined within each individual EIA topic chapter.

5.5 References

ABPmer, (2021). Mostyn Energy Park Extension, Scoping Report, ABPmer Report No. R.3738. A report produced by ABPmer for Port of Mostyn, October 2021.

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Defra (2018). Local Air Quality Management Technical Guidance (TG16). Defra, London. Available at: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf (accessed September 2021).

IEMA (1993). Institute of Environmental Assessment Guidance Note No 1 Guidelines for the Environmental Assessment of Road Traffic.

IEMA (2016). Environmental Impact Assessment Guide to: Delivering Quality Development

5.6 Abbreviations/Acronyms

BPEO	Best Practical Environmental Option
CIEEM	Chartered Institute of Ecology and Environmental Management
ECIA	Ecological Impact Assessment
EEA	European Economic Area
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
GOV	Government
HRA	Habitats Regulations Assessment
IEMA	Institute of Environmental Management and Assessment
LAQM	Local Air Quality Management
MCA	Maritime and Coastguard Agency
MEPE	Mostyn Energy Park Extension
MHWS	Mean High Water Springs
MPS	Marine Policy Statement
NA	Not applicable
NRA	Navigational Risk Assessment
NRW	Natural Resources Wales
NTS	Non-Technical Summary
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
RTPI	Royal Town Planning Institute
SHA	Statutory Harbour Authority
UK	United Kingdom
WFD	Water Framework Directive
WHA	Waste Hierarchy Assessment
WNMP	Welsh National Marine Plan

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

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