Connah's Quay Low Carbon Power

Environmental Statement Volume IV Appendix 12-A: Marine Ecology Assessment Methodology

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Appendix Summary

This appendix provides detail on the assessment methodology used to inform the potential effects on marine ecology receptors during construction, operation and decommissioning of the Connah's Quay Combined Cycle Gas Turbine (CCGT) with Carbon Capture Plant (CCP) and supporting infrastructure (the 'Proposed Development'). This appendix should be read in conjunction with Section 12.3 of the Environmental Statement (ES), **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**).

The assessment of impacts and likely significant effects has been undertaken in line with the Chartered Institute of Ecology and Environmental Management's (CIEEM's) Guidelines for Ecological Impact Assessment in the United Kingdom (UK) and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref 1). The assessment methodology includes identification of the importance of an ecological receptor, identifying the value and sensitivity of a receptor and determining the magnitude of the impact through a range of different criteria, in order to reach a conclusion of significance. The significance of potential effects has been evaluated using a systematic approach together with the expert judgement of the specialist consultant. The criteria used for marine ecology are detailed in this appendix.

The CIEEM guidelines advocate a non-matrix approach, but to keep consistency with other disciplines, assessment conclusions are translated into terminology detailed in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**). These defined terminologies have been used to provide a framework for the consistent and transparent assessment of predicted effects across all receptor topics; however, it is important to note that the defined terms act as a guide and that assessments also allow for the application of expert judgement. Criteria are therefore assigned to consider the likely effects, rather than a check list whereby all definitions are met in order for the category to be used.

This appendix also details the data sources used in a desk study to inform the marine ecological assessment in the absence of marine ecology surveys. Several publicly available data sources have been considered which are relevant to the study area to understand the relative importance, geographical contexts and functionality of the receptors considered.

1. Marine Ecology Assessment Methodology

1.1 Methodology and Aims

1.1.1 This appendix describes the assessment methodology carried out in relation to marine ecological receptors. A general Environmental Impact Assessment (EIA) methodology is outlined in **Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**).

1.1.2 The impacts and effects on marine ecology outlined in **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**), as part of project specific ecological impact assessments (EcIAs), have been undertaken in accordance with the CIEEM's Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine 2024 (Ref 1) and has considered the interconnectivity of marine ecology and the small number of impacts likely to occur.

1.1.3 In accordance with CIEEM guidance (Ref 1), not all habitats and species which have the potential to occur within the Zone of Influence (ZoI) of the Proposed Development have been considered within **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**). Rather, focus has been placed on those features considered to be 'important' and most likely to occur – determining importance is discussed in further detail below. To ensure compliance with National and European policy, consideration is still given to biodiversity in its entirety and the need to achieve 'no net loss' and enhancement of biodiversity.

1.1.4 The aims of the EcIA are to:

- identify important ecological features (e.g., designated sites, habitats or species) which have the potential to be impacted by the Proposed Development;
- provide a robust assessment of the ecological impacts and resultant likely significant effects of the Proposed Development, which may be beneficial (i.e., positive) or adverse (i.e., negative);
- facilitate determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its impact pathways;
- identify appropriate mitigation to reduce any potential significant effects; and
- set out the steps to be taken to adhere to legal requirements relating to the relevant ecological features concerned.

1.2 Value / Sensitivity of Receptors

1.2.1 Receptor sensitivity is defined as the degree to which a receptor is affected by an impact. The sensitivity of the receptor is characterised by three factors. All factors interact to determine a receptor's sensitivity and resilience to a given impact:

- vulnerability – the vulnerability of the receptor relates to its capacity to accommodate change i.e., the tolerance / intolerance of the receptor to change;
- recoverability – the ability of the receptor to return to the baseline state before the Proposed Development impact caused the change; and
- importance – the importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value, and economic value. The value of sites, habitats and potential for protected and notable species are evaluated with reference to both their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations) and their legal status importance of the receptor is also defined within a geographical context, based on the following conservation or legal status:
  - international (designated National Site Network sites in accordance with the Habitats Regulations– Special Areas of Conservation (SACs), Special Protected Areas (SPAs), as well as Ramsar Sites);
  - national (UK protected areas – Sites of Special Scientific Interest (SSSI), Marine Protected Areas (MPAs), and Marine Conservation Zones (MCZs)); and
  - regional or local (ecological features that do not meet criteria for valuation at an international or national level, but that have sufficient value to merit retention or mitigation e.g., for the purpose of ensuring no net loss of biodiversity).

1.2.2 Considering the interaction between these variables, a receptor's sensitivity can be classified into four criteria summarised in **Table 1**. The sensitivity of an ecological feature has been defined with reference to a specific geographical context and the scale of protection, ensuring consistency with CIEEM (2019) guidance (Ref 1).

Table 1: Sensitivity / Value Criteria for Marine Ecology

Sensitivity / Value	Sensitivity / Value Criteria*
High	Designated sites and qualifying / supporting features of international importance. Species which are legally protected and / or in significant decline (i.e., classified as 'endangered' or 'critically endangered' according to the International Union for Conservation of Nature (IUCN) Red List (Ref 2)).

Sensitivity / Value	Sensitivity / Value Criteria*
	High quality examples of rare habitats which are threatened throughout their range.
Medium	Designated sites and qualifying / supporting features of national conservational importance. Priority habitats and species or those considered to be of principal importance for the conservation of biodiversity in England and those species considered vulnerable to decline (i.e. classified as 'vulnerable' or 'near threatened' according to the IUCN Red List). High quality examples of uncommon habitats which are vulnerable throughout their range.
Low	Habitats and species of regional or local importance (i.e., Annex 1 habitats, in accordance with the Habitats Regulations, which are not a qualifying feature of a nearby designated site). Those species considered to be of 'least concern' (according to the IUCN Red List or listed in the Oslo and Paris Conventions (OSPAR) list of threatened and/or declining species for the North-East Atlantic). Poor quality examples of rare or uncommon habitats which are threatened or vulnerable throughout their range.
Very Low	Habitats and species of low conservation importance, such as those generally abundant and widespread around the UK with no specific local value.

*Should there be any overlap in the description of a particular feature/receptor, the worst-case importance criteria are adopted.

1.3 Magnitude of Impacts

1.3.1 The potential magnitude of change on marine ecological features arising from activities occurring as part of the Proposed Development is determined in consideration of their beneficial or adverse nature, extent, duration, timing, frequency, and reversibility of the impact.

1.3.2 Temporary, permanent, direct and indirect impacts have been considered during the construction, operation and decommissioning phases of the Proposed Development, and any mitigation measures necessary have been identified. To ensure compliance with National and European policy, consideration is still given to the need to maintain and enhance biodiversity. The magnitude criteria for marine ecological features are shown in **Table 2**.

Table 2: Magnitude criteria for marine ecological features

Magnitude	Magnitude Criteria
High	The impact occurs over a large spatial extent resulting in widespread, long-term, or permanent changes in

Magnitude	Magnitude Criteria
	baseline conditions or affects a large proportion of a receptor population. The impact is very likely to occur and/or would occur at a high frequency or intensity. The impact may also relate to resources or features which are unique and which, if lost, either cannot be replaced or relocated or else may take a very long time to recover or be replaced. **Adverse:** Loss of resource and / or quality and integrity of resource; severe damage to key characteristics, features or elements. **Beneficial:** Large scale or major improvement of resource and / or quality; extensive restoration; major improvement of attribute quality.
Medium	The impact occurs over a medium spatial extent resulting in medium-term, or partial changes in baseline conditions or partially affects a proportion of a receptor population. The impact is likely to occur and/or would occur at a medium frequency or intensity. **Adverse**: Loss of resource, but not adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements. **Beneficial**: benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	The impact occurs over a small spatial extent resulting in short-term, or small changes in baseline conditions, or partially affects a small proportion of a receptor population. The impact has a low likelihood of occurring and/or would occur at a low frequency or intensity. **Adverse**: Some measurable change in attributes, quality, minor loss of, or alteration to, one or more key characteristics, features or elements. **Beneficial**: Minor benefit to, or in addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk or negative impact occurring.
Very Low	The impact occurs over a minor spatial extent resulting in very short-term, or minor changes in baseline conditions or partial effects to a very small proportion of a receptor population. The impact has a very low likelihood of occurring and/or would occur at a very low frequency or intensity.

Magnitude	Magnitude Criteria
	Adverse: Very minor loss of detrimental alteration to one or more characteristics, features or elements. **Beneficial**: Very minor benefit to or positive addition of one or more characteristics, features or elements.

1.4 Significance Criteria

1.4.1 To evaluate the significance of an effect, the following parameters have been considered:

- impact type – direct or indirect, positive or negative, temporary or permanent; and
- magnitude of impact – the 'amount' or intensity of an impact. This may sometimes be synonymous with 'extent' (see below) for certain receptors, such as habitat loss. For mortality it may be the number of individuals killed.

1.4.2 The assessment has also given regard to the sensitivity of an ecological feature to an impact which is determined by its:

- adaptability i.e., the capacity, or lack thereof, of a feature to avoid or adapt to a change; and
- tolerance / resilience i.e., capacity, or lack thereof, of a feature to accommodate temporary or permanent change or recover to pre-existing state following exposure to a change.

1.4.3 By combining the characteristics of an impact pathway with the importance and sensitivity of ecological features or receptors, a measure of the significance of effects on marine ecology can be derived.

1.4.4 For each marine ecological receptor, only those characteristics relevant to understanding the ecological effect and determining the effect significance are described. The determination of the significance of effects has been made based on the predicted impacts to designated sites, ecosystems, habitats, and species, as outlined in Section 12.6 in **Chapter 12: Marine Ecology** (**EN010166/APP/6.2.12**).

1.4.5 Conclusions on the significance of effects are assessed as being either:

- not significant – no effect to one or more of the features described above; or
- significant – one or more features described above are affected.

1.4.6 CIEEM does not advocate a matrix approach for determining the significance of effects on ecological receptors (Ref 1). However, maintaining consistency with other disciplines / the wider ES, where a matrix approach is suitable, should be considered. As such, the assessment conclusions presented within this chapter have been translated into the significance terminology used within the wider ES (**Chapter 2: Assessment Methodology** (**EN010166/APP/6.2.2**)). However, for ecological disciplines, such as marine

ecology, the matrix approach acts as a guide and assessments also allow for the application of expert judgement in considering the final significance rating. Criteria are therefore assigned to consider the likely effects, rather than a check list whereby all definitions are met in order for the category to be used.

1.5 Data Sources

1.5.1 The baseline conditions for marine ecology have been determined using findings from the intertidal walkover and drone survey carried out in July 2024 for the Proposed Development and a desk-based study.

1.5.2 Details on the intertidal walkover and drone survey are described in **Appendix 12-D** (**EN010166/APP/6.4**)**.** The survey was carried out within the 'intertidal survey area' which comprised the Water Connection Corridor and surrounding estuarine habitat and is shown in Plate 1 **Appendix 12-D** (**EN010166/APP/6.4**)**.**

1.5.3 The study areas shown in **Figure 12-1: Study Area** (**EN010166/APP/6.3**) were used to define the area of search for the desk-based study. Further information of the study area for marine ecology is described in Section 12.4 (**Chapter 12 Marine Ecology** (**EN010166/APP/6.2.12**)). Although they fall outside of the initial 10 km study area, the Port of Mostyn, Port of Ellesmere and Connah's Quay North, have also been considered as part of the Study Area as they are being considered for the delivery of construction material.

1.5.4 The desk-based study identified several publicly available data sources relevant to the study area for each marine receptor. The review study determined the nature conservation designated sites and protected species and habitats to be considered within this assessment of the potential impact pathways arising from the Proposed Development. Furthermore, the data sources were used to provide the relative importance, functionality, and geographical context of each receptor. The following sources of information have been reviewed and have informed the assessment:

- Multi Agency Geographic Information for the Countryside (MAGIC) - information on marine, coastal and estuarine habitats and species and designated site information (Ref 3);
- Joint Nature Conservation Committee (JNCC) - reasons for protected site designation and other relevant information (Ref 4);
- Natural Resources Wales Information Portal – information on species and habitats (Ref 5);
- Natural England & Countryside Council for Wales – relevant information on marine designated features of the Dee Estuary designated sites (Ref 6);
- Habitat mapping undertaken by the JNCC (Ref 7) – Marine Nature Conservation Review (MNCR) area summaries and the Environment Agency saltmarsh zonation and extent in England (Ref 8);
- Shellfish classification zones of England and Wales provided by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) (Ref 9);

- Small Cetacean Abundance in the European Atlantic and North Sea (SCANS) IV data (Ref 10);
- Inter-Agency Marine Mammal Working Group (IAMMWG) publications (Ref 11);
- Sea Mammal Research Unit (SMRU) (Ref 12) and Special Committee on Seals (SCOS) (Ref 13) publications;
- International Council for the Exploration of the Sea (ICES) publications and data (Ref 14);
- Marine Evidence Based Sensitivity Assessment (MarESA) - habitat and species sensitivity assessments, where available (Ref 15);
- Environment Agency – information of transitional and coastal waters fish counts (TraC data) (Ref 16) and marine abundance invertebrate data (Ref 17) where available[1];
- Environment Agency - The extent and zonation of saltmarsh in England (Ref 18); and
- Environment Agency – Salmonid and fisheries statistics for England and Wales (Ref 19).

[1] No Environment Agency fish sampling stations were located within the River Dee and therefore no information on fish counts were available.

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