

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

HRA Stage 2 Information to support an appropriate assessment

Part 2: Special areas of conservation (SACs) assessments

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Image of an offshore wind farm

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

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Glossary

Term	Meaning
Annex I habitat	A natural habitat type of community interest, defined in Annex I of the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive), whose conservation requires the designation of Special Areas of Conservation (SAC).
Annex II species	Animal or plant species of community interest, defined in Annex II of the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive), whose conservation requires the designation of Special Areas of Conservation.
Applicant	Morgan Offshore Wind Limited.
Appropriate Assessment	A step-wise procedure undertaken in accordance with Article 6(3) of the Habitats Directive, to determine the implications of a plan or project on a European site in view of the site's conservation objectives, where the plan or project is not directly connected with or necessary to the management of a European site but likely to have a significant effect thereon, either individually or in-combination with other plans or projects.
Benthic ecology	Benthic ecology encompasses the study of the organisms living in and on the sea floor, the interactions between them and impacts on the surrounding environment.
Competent Authority	The term derives from the Habitats Regulations and relates to the duties which the Regulations impose on public bodies and individuals. Regulation 6(1) defines competent authorities as "any Minister, government department, public or statutory undertaker, public body of any description or person holding a public office".
Conservation objectives	In its most general sense, a conservation objective is the specification of the overall target for the species and/or habitat types for which a site is designated in order for it to contribute to maintaining or reaching Favourable Conservation Status (FCS) of the habitats and species concerned, at the national, the biogeographical or the European level.
Cumulative effects	Changes to the environment caused by a combination of present and future projects, plans or activities.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Ensonified	Filled with sound.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Morgan Offshore Wind Project; Generation Assets.
European Commission	The executive body of the European Union responsible for proposing legislation, enforcing European law, setting objectives and priorities for action, negotiating trade agreements and managing implementing European Union policies and the budget.
European site	A Special Area of Conservation, possible SAC, or candidate SAC, a Special Protection Area (SPA) or potential SPA, Ramsar site, or a site listed as a Site of Community Importance.

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Term	Meaning
Evidence plan	The Evidence Plan is a mechanism to agree upfront what information the Applicant needs to supply to the Planning Inspectorate as part of the Development Consent Order (DCO) application for the Morgan Offshore Wind Project.
Expert Working Group (EWG)	Expert working groups set up with relevant stakeholders as part of the Evidence Plan process.
Habitat	The environment that a plant or animal lives in.
Habitats Directive	The Habitats Directive is the short name for European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. The Directive led to the establishing of European sites and setting out how they should be protected, it also extends to other topics such as European protected species.
Habitats Regulations	The Conservation (Natural Habitats, &c.) Regulations 1994, the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species 2017.
Habitats Regulations Assessment	A process required by the Habitats Regulations of identifying likely significant effects of a plan or project on a European site and (where likely significant effects are predicted or cannot be discounted) carrying out an appropriate assessment to ascertain whether the plan or project will adversely affect the integrity of the European site. If Adverse Effects on Integrity cannot be ruled out, the latter stages of the process require consideration of the derogation provisions in the Habitats Regulations.
In-combination effects	The combined effect of the Morgan Generation Assets in-combination with the effects from a number of different projects on the same feature/receptor.
Infauna	The animals living in the sediments of the seabed.
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.
Interconnector cables	Cables that may be required to interconnect the Offshore Substation Platforms in order to provide redundancy in the case of cable failure elsewhere.
Likely Significant Effect	Any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the European site was designated, but excluding trivial or inconsequential effects. A likely effect is one that cannot be ruled out on the basis of objective information. A 'significant' effect is a test of whether a plan or project could undermine the site's conservation objectives.
Littoral	Residing within the littoral zone which extends from the high water mark, which is rarely inundated, to shoreline areas that are permanently submerged.
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a DCO to apply for 'deemed marine licence' as part of the DCO process.
Masking	Masking occurs when sound emissions interfere with a marine animal's ability to hear a sound of interest.
Maximum Design Scenario (MDS)	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.

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Term	Meaning
Morecambe Offshore Windfarm: Generation Assets	The Morecambe Offshore Windfarm is located in the east Irish Sea approximately 37.13 km (20.1 nm) from the northwest coast of England (when measured from MHWS). The anticipated nominal capacity of the Morecambe Offshore Windfarm is 480 MW.
Morgan Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, scour protection, cable protection and offshore substation platforms (OSPs) forming part of the Morgan Offshore Wind Project will be located.
Morgan Offshore Wind Project: Generation Assets	This is the name given to the Morgan Generation Assets project as a whole (includes all infrastructure and activities associated with the project construction, operations and maintenance, and decommissioning).
The Morgan Generation Assets Preliminary Environmental Information Report PEIR	The Morgan Generation Assets Preliminary Environmental Information Report (PEIR) that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan Offshore Wind Project Generation Assets.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The Transmission Assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400kV grid connection cables and associated grid connection infrastructure such as circuit breaker infrastructure.
Offshore Substation Platform (OSP)	A fixed structure located within the wind farm sites, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Oligotrophic	A deficiency of plant nutrients that is usually accompanied by an abundance of dissolved oxygen.
Relevant Local Planning Authority	The Relevant Local Planning Authority is the Local Authority in respect of an area within which a project is situated, as set out in Section 173 of the Planning Act 2008. Relevant Local Planning Authorities may have responsibility for discharging requirements and some functions pursuant to the DCO, once made.
Special Area of Conservation	Special Areas of Conservation are areas designated under the European Union Habitat's Directive to help conserve certain plant and animals species listed in the Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).
Species	A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.
Statutory consultee	Organisations that are required to be consulted by an applicant pursuant to the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).
Sublittoral	Area extending seaward of low tide to the edge of the continental shelf.
Subtidal	Area extending from below low tide to the edge of the continental shelf.
Suspended sediment concentration	Suspended sediment concentration, which is defined as the total value of both mineral and organic material carried in suspension by a volume of water.
The Planning Inspectorate	The agency responsible for operating the planning process applications for development consent under the Planning Act 2008.

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Term	Meaning
The Secretary of State for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Morgan Offshore Wind Project: Generation Assets.
Tidal excursion	The horizontal distance over which a water particle may move during one cycle of flood and ebb.
Wind turbines	The wind turbine generators, including the tower, nacelle and rotor.

Acronyms

Acronym	Description
AC	Alternating Current
ADD	Acoustic Deterrent Devices
CBRA	Cable Burial Risk Assessment
CCW	Countryside Council Wales
Cefas	Centre for Environment Fisheries and Aquaculture Science
CPT	Cone Penetration Test
CTV	Crew Transfer Vessel
DAERA	Department for Environment, Food and Rural Affairs
DCO	Development Consent Order
DP	Dynamic Positioning
EDR	Effective Deterrence Range
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMP	Environmental Management Plan
EWG	Expert Working Group
FCS	Favourable Conservation Status
GSRP	Grey Seal Reference Population
HF	High Frequency
HRA	Habitats Regulations Assessment
HSRP	Harbour Seal Reference Population
HVAC	High Voltage Alternating Current
iPCoD	Interim Population Consequences of Disturbance Model
ISAA	Information to Support an Appropriate Assessment
IS MU	Irish Sea Management Unit
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
MBES	Multi-Beam Echo-Sounder

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Acronym	Description
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MMOs	Marine Mammal Observers
MPCP	Marine Pollution Contingency Plan
MU	Management Unit
NAS	Noise Abatement System
NEQ	Net Explosive Quantity
NIEA	Northern Ireland Environment Agency
NMFS	National Marine Fisheries Service
NRW	National Resources Wales
OSP	Offshore Substation Platform
OSPAR	Oslo-Paris
PAM	Passive Acoustic Monitoring
PCW	Phocid Carnivore in Water
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PTS	Permanent Threshold Shift
RIAA	Report to Inform Appropriate Assessment
rms	Route mean square
SAC	Special Area of Conservation
SBES	Single Beam Echosounder
SBP	Sub-Bottom Profilers
SCANS	Small Cetacean Abundance in the North Sea
SCI	Site of Community Importance
SCOS	Special Committee on Seals
SEL	Sound Exposure Level
SEL _{cum}	Cumulative Sound Exposure Level
SEL _{ss}	Single-strike Sound Exposure Level
SMRU	Sea Mammal Research Unit
SNCB	Statutory Nature Conservation Bodies
SOV	Service Operation Vessel
SPA	Special Protection Area
SPL _{pk}	Peak Sound Pressure Level

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Acronym	Description
SSC	Suspended Sediment Concentration
SSS	Sidescan Sonar
SSSI	Site of Special Scientific Interest
S42	Section 42
TCE	The Crown Estate
TTS	Temporary Threshold Shift
TWT	The Wildlife Trust
UHRS	Ultra High Resolution Seismic
UWSMS	Underwater Sound Management Strategy
UXO	Unexploded Ordinance
VHF	Very High Frequency
Zol	Zone Of Influence

Units

Unit	Description
%	Percentage
cm	Centimetres
dB	Decibel
GWh	Gigawatt hour
Ha	Hectares
Hz	Hertz
kg	kilogram
kHz	Kilo-hertz
kJ	Kilojoule
km	Kilometres
km ²	Square kilometres
kn	Knot
kV	Kilovolts
m	Metre
m ²	Square metres
mG	Milligauss
MI/d	Megalitres per day
mm	Millimetres
MW	Megawatt

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Unit	Description
°C	Degrees centigrade
μT	Microtesla
μPa	Micro Pascal

1 Habitats Regulations Assessment Stage 2 Information to Support an Appropriate Assessment – Part 2: SAC assessments

1.1 Introduction

1.1.1 Purpose of the Information to Support an Appropriate Assessment

1.1.1.1 This Information to Support an Appropriate Assessment (ISAA) has been prepared by RPS, on behalf of the Applicant, to support the Habitats Regulations Assessment (HRA) required under Section 63 of the Conservation of Habitats and Species Regulations 2017 as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and Section 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 (the Habitats Regulations) for the Morgan Offshore Wind Project: Generation Assets (hereafter referred to as Morgan Generation Assets).

1.1.1.2 The HRA Stage 2 ISAA builds upon the HRA Stage 1 Screening Report (Document Reference E1.4) and considers whether the Morgan Generation Assets could have an adverse effect, either alone or in-combination with other plans or projects, on the integrity of any European site. This report will provide the Competent Authority with the information required to undertake an HRA Stage 2 Appropriate Assessment, see HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1) for more detail on the HRA process.

1.1.1.3 The scope of this HRA Stage 2 ISAA – Part 2 Special Areas of Conservation (SAC) assessments covers all relevant SACs and designated features where a Likely Significant Effect (LSE) has been identified in the HRA Stage 1 Screening Report (Document Reference E1.4), due to the potential impacts arising from the Morgan Generation Assets.

1.1.2 Structure of the ISAA

1.1.2.1 As detailed in section 1.2.5 of the HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1), for clarity and ease of navigation, the ISAA is structured and reported in several ‘Parts’, as follows:

- HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1)
- HRA Stage 2 ISAA Part 2– SAC assessments (Document Reference E1.2) (this document)
- HRA Stage 2 ISAA Part 3 – Special Protection Area (SPA) assessments (Document Reference E1.3).

1.1.2.2 Each ‘Part’ of the ISAA is supported by a series of topic specific appendices and relevant documentation including European site summaries.

1.1.3 Structure of this document

1.1.3.1 This document constitutes the HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2) and provides consideration of the implications of the Morgan Generation Assets on SACs.

1.1.3.2 This document is structured as follows:

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- Section 1.1: Introduction – this section details the purpose and structure of the ISAA
- Section 1.2: Consultation – this section provides a summary of the consultation undertaken with regards to the qualifying features of SACs, the responses provided, and how these have been addressed within this Part of the ISAA
- Section 1.3: Summary of HRA Stage 1 Screening – this section presents the SACs where LSE was identified and the features and pathways for which HRA Stage 2 ISAA is required, both alone and in-combination.

1.1.3.3 Information for the HRA Stage 2 Appropriate Assessments is then provided in:

- Section 1.4: Information to inform the Appropriate Assessments, including Maximum Design Scenarios (MDSs), measures adopted as part of the Morgan Generation Assets, an outline of the approach taken to baseline data, conservation objectives, and the in-combination assessment
- Section 1.5: Assessment of potential adverse effects on the integrity of European sites designated for Annex II diadromous fish, alone and in-combination
- Section 1.6: Assessment of potential adverse effects on the integrity of European sites designated for Annex II marine mammals, alone and in-combination
- Section 1.7: Summary – the conclusions of sections 1.5 and 1.6 are summarised for clarity and the overall findings of this Part of the ISAA are provided.

1.2 Consultation

1.2.1.1 Consultation has been undertaken with statutory stakeholders during key stages of the Morgan Generation Assets with regards to the relevant physical processes, benthic ecology, and relevant Annex II fish and marine mammal features of SACs/Sites of Community Importance (SCIs).

1.2.1.2 A summary of the details of key consultation undertaken to date which is relevant to the HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2), the Morgan Generation Assets and the HRA process in general, is presented in Table 1.1.

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Table 1.1: Summary of key consultation relevant to the HRA Stage 2 ISAA Part 2 – SAC assessments for the Morgan Generation Assets.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
Steering Group				
July 2022	Natural Resource Wales (NRW), Natural England, Marine Management Organisation (MMO), Joint Nature Conservation Committee (JNCC) and Planning Inspectorate	Steering Group meeting	<ul style="list-style-type: none"> LSE Methodology circulated to members of the Steering Group to gain feedback and agreement on the methodology to be used Methodology approach presented included the process for identifying European sites and species where there is the potential for a LSE. The process and associated buffers used to screen in sites was presented for Annex I habitats (offshore and coastal), Annex II diadromous fish, Annex II marine mammals and ornithology. <p>NRW responses:</p> <ul style="list-style-type: none"> NRW agreed with the LSE Screening Methodology criteria that have been provided with respect to Marine and Coastal Physical Processes and benthic ecology NRW noted that with reference to The Crown Estate (TCE) Round 4 HRA principles, specifically section 3.6.17 – 3.6.23 migratory fish and freshwater pearl mussel, and Figure 3.1 Proposed regional boundaries for Atlantic salmon <i>Salmo salar</i> (from ABPmer (2014), cited in ABPmer (2018)), that a 100 km buffer is used for most diadromous fish except Atlantic salmon and freshwater pearl mussel, which use a 'Regional Areas Approach' NRW advised that TCE Round 4 HRA principles are adopted in their original form, or that further justification is provided if they are not. <p>JNCC responses:</p>	<p>Feedback received on the methodology has been considered and incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) in section 1.3.</p> <p>TCE Round 4 HRA principles have been adopted in their original form within the HRA Stage 1 Screening Report (Document Reference E1.4), for example for Annex II diadromous fish a 100 km buffer has been used for all features, other than Atlantic salmon where a 'regional areas approach' has been used, see Figure 1.3 and Figure 1.4.</p> <p>For Annex II marine mammals, the TCE Round 4 HRA principles have not been adopted in their original form. The Applicant has followed advice from NRW that requests the use of marine mammal Management Units (MU) (IAMMWG, 2015) and the OSPAR Region III Interim MU (for grey seal) (OSPAR, 2023) to identify European sites with Annex II marine mammal features with the potential for connectivity to the Morgan Generation Assets. For more information see the marine mammal specific consultation below and section 1.3 of the HRA Stage 1 Screening Report (Document Reference E1.4).</p> <p>Natural England and MMO had no objections to the approach adopted following NRW's feedback.</p>

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Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			<ul style="list-style-type: none"> JNCC were content with the LSE Screening Methodology with respect to Annex I habitats offshore and Annex II marine mammals. <p>Natural England and MMO had no specific responses in relation to the LSE Screening Methodology with respect to Annex II marine mammals.</p>	
October 2023	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	<ul style="list-style-type: none"> In response to concerns from stakeholders due to underwater sound associated with piling for bottlenose dolphin SACs the Applicant proposes an Underwater Sound Management Strategy (UWSMS) (similar to a piling strategy as per Beatrice, Seagreen Alpha and Bravo, Moray East and Neart na Gaoithe offshore wind farms) which is secured through the DCO The UWSMS will set out the detailed project design prior to construction compared to the application for consent, considering: <ul style="list-style-type: none"> Number of foundations requiring piling Refinement of hammer energies and durations Further information on environmental receptors. Further information on what cumulative projects are piling Based on the detailed project design and updated environmental sensitivities, the risk of effects would be reconsidered post consent with the Licensing Authority to agree what mitigation and/or management measures would be required. The options may include: <ul style="list-style-type: none"> Measures to minimise injury, e.g. soft starts, pre piling searches, Acoustic Deterrent Devices (ADDs) etc. Spatial restrictions 	<p>Project refinements and potential mitigation options will be considered within the Outline UWSMS, which has been developed by the Applicant, an outline of which has been submitted with the application for consent (Document Reference J13) with an Outline Marine Mammal Mitigation Plan (Document Reference J17).</p> <p>The final UWSMS will be secured within the deemed marine licences in the draft DCO (Document Reference C1) and is expected to be secured within the marine licences. The UWSMS will be developed post-application through discussion and consultation with the licensing authority and Statutory Nature Conservation Bodies (SNCBs).</p> <p>The Applicant will continue to explore options for mitigating underwater sound post consent, at a time when more detailed information is available (i.e. geotechnical data) and where further refinements to the Morgan Generation Assets detailed design have been made on this basis. Use of sound reduction or Noise Abatement Systems (NAS) will be considered as an option post consent and following the mitigation hierarchy - avoid, reduce, mitigate. Consequently, if NAS is required a detailed exploration of available technologies will be undertaken and information presented to demonstrate how such technology would contribute to the reduction in underwater sound from piling.</p> <p>A full assessment of the adverse effects on the integrity of European sites designated for marine</p>

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Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			<ul style="list-style-type: none"> – Sound abatement • Other measures as may be required. 	mammals is presented in 1.6, including for bottlenose dolphin.
Expert Working Groups				
Marine mammals				
February 2022	NRW, Natural England, MMO, JNCC, Centre for Environment Fisheries and Aquaculture Science (Cefas) and The Wildlife Trusts (TWT).	Expert Working Group (EWG) 01 meeting	<ul style="list-style-type: none"> • Position on the use of marine mammal MUs for impact assessment or screening, and advice on applying these marine mammal MUs during screening to inform the assessment of adverse effects on site integrity in the appropriate assessment, which was provided in NRW's position statement. • Natural England and MMO had no specific comments on the LSE Screening during this meeting although the adopted approach was agreed with stakeholders in subsequent EWGs. 	<p>Marine mammal MUs, including the OSPAR III Region (for grey seals) have been used when screening for LSE in the HRA Stage 1 Screening Report (Document Reference E1.4).</p> <p>The sites carried forward to Appropriate Assessment are listed in Table 1.49.</p>
July 2022	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG02 meeting	<ul style="list-style-type: none"> • LSE Methodology presented and discussed to the EWG for agreement on the methodology to be used. 	<p>Feedback on the LSE Methodology has been incorporated into HRA Stage 1 Screening Report (Document Reference E1.4). and this HRA Stage 2 ISAA Part 2 – SAC assessments.</p> <p>Marine mammal MUs, including the OSPAR III Region (for grey seals) have been used when screening for LSE in the HRA Stage 1 Screening Report (Document Reference E1.4) in section 1.3.4.</p>
November 2022	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG03 meeting	<ul style="list-style-type: none"> • Approach to HRA Screening with regard to the process and foraging ranges/MUs used to identify relevant sites and species. 	<p>The use of marine mammal MUs were used to identify sites with the potential for connectivity with the Morgan Generation Assets in section 1.3.4 of the HRA Stage 1 Screening and European sites within the relevant MUs where a potential LSE was identified have been brought through to this HRA Stage 2 ISAA. These sites are listed in Table 1.49.</p>
February 2023	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG04 meeting	<ul style="list-style-type: none"> • Reference populations and densities for marine mammals were discussed • Outline of the approach to Interim Population Consequences of Disturbance (iPCoD) 	<p>The agreed reference populations, densities and results of iPCoD modelling have been used when carrying out assessment of impacts for Annex II marine mammals in 1.6.4 and 1.6.5 of this HRA</p>

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			<p>modelling for the Morgan Generation Assets alone and in-combination assessment.</p>	<p>Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2).</p> <p>For the purpose of the marine mammal assessment, the reference populations were agreed following specific feedback from the EWG.</p> <p>For harbour porpoise, bottlenose dolphin, and harbour seal the MUs outlined (Celtic and Irish Seas MU, Irish Seas MU and Wales and North West England MU, respectively) have been used for the identification of European sites with Annex II marine mammals features, for grey seal the relevant European sites within the OSPAR III Region have been considered for potential LSE in section 1.3.3 of the HRA Stage 1 Screening Report (Document Reference E1.4). Additional information set out in Carter <i>et al.</i> (2022) and telemetry data presented in the PEIR (Wright and Sinclair, 2022) has then been used to screen out SACs with no potential connectivity with the Morgan Generation Assets. The sites with potential LSE have been carried forward to this HRA Stage 2 ISAA – Part 2 SAC assessments and are listed in Table 1.49.</p>
<p>June 2023</p>	<p>NRW, Natural England, MMO, JNCC, Cefas and TWT.</p>	<p>EWG05 meeting</p>	<ul style="list-style-type: none"> • A discussion to summarise the main Section 42 (S42) consultation relevant to marine mammals and how this will be addressed moving from Preliminary Environmental Information Report (PEIR) to the application for consent (these were discussed as part of subsequent EWG meetings, hence are summarised in the table below and in the relevant marine mammal S42 comments) • Discussion on use of the Effective Deterrent Range (EDR) approach and including the unweighted sound threshold of 143 dB re 1 µPa single strike sound exposure level (SEL_{ss}) (or Very High Frequency (VHF)-weighted 103 dB re 1 µPa SPL (root mean square (rms)) to represent the minimum fixed sound threshold at 	<p>Discussion outputs have been incorporated into section 1.6 of HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2), the unweighted sound threshold of 143 dB re 1µPa²s SEL_{ss} has been presented to represent the minimum fixed sound threshold at which significant disturbance could occur, for harbour porpoise.</p> <p>The main S42 comments and responses for marine mammals were discussed as part of subsequent consultation. These are therefore also discussed in this table, under the following sections:</p> <ul style="list-style-type: none"> • the EWG06 meeting (December 2023) section; and • the S42 Consultation section, Annex II marine mammals.

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			<p>which significant disturbance could occur for Environmental Statement and HRA</p> <ul style="list-style-type: none"> • Removal of the use of dose response for HRA. Dose-response is based on observed probability of a behavioural response and is not considered appropriate for an area-based assessment. 	<p>The dose response approach was removed for bottlenose dolphin, grey seal and harbour seal considered in this HRA Stage 2 ISAA. The National Marine Fisheries Service (NMFS) level-B harassment threshold of 160 dB re 1 μPa SPL_{rms} has been applied for piling for the area-based assessment in section 1.6 for bottlenose dolphin, grey seal and harbour seal features.</p>
October 2023	NRW, Natural England, MMO, JNCC, TWT, Cefas, IoM and Defra	Technical note issued to NRW, Natural England, MMO, JNCC, Cefas and TWT after EWG05	<p>RPS produced a technical note to seek feedback on the following topics of relevance to the HRA:</p> <ul style="list-style-type: none"> • Consideration of OSPAR Region III or maximum foraging range for grey seal in-combination assessment • Species-specific MUs and additional information provided by telemetry studies used for screening of European sites with Annex II marine mammals features for HRA Stage 1 Screening • The approach was accepted through the EWG process, and therefore the same approach has been carried forward for the final HRA, as follows: <ul style="list-style-type: none"> – For harbour porpoise all sites within the Celtic and Irish Seas MU will be considered – For bottlenose dolphin all sites within the Irish Sea MU will be considered – For grey seal all SACs in the Wales MU, North West England MU, Southwest Scotland and Northern Ireland MU will be screened for LSE. Additional information set out in Carter <i>et al.</i> (2022) and telemetry data presented in the PEIR (Wright and Sinclair, 2022), indicates some potential connectivity with the Isles of Scilly Complex SAC, Lundy SAC, The Maidens SAC and Saltee Islands SAC and these sites are therefore included 	<p>For harbour porpoise, bottlenose dolphin, and harbour seal the MUs outlined (Celtic and Irish Seas MU, Irish Seas MU and Wales and North West England MU, respectively) have been used for the identification of European sites with Annex II marine mammals features, for grey seal the relevant European sites within the OSPAR III Region have been considered for potential LSE in section 1.3.3 of the HRA Stage 1 Screening Report (Document Reference E1.4). Additional information set out in Carter <i>et al.</i> (2022) and telemetry data presented in the PEIR (Wright and Sinclair, 2022) has then been used to screen out SACs with no potential connectivity with the Morgan Generation Assets. The sites with potential LSE have been carried forward to this HRA Stage 2 ISAA – Part 2 SAC assessments and are listed in Table 1.49.</p> <p>As outlined above, the unweighted sound threshold of 143 dB re 1 μPa²s SEL_{ss} has been used to assess disturbance resulting from piling for harbour porpoise features and the dose response approach has been removed from the HRA Stage 2 ISAA. The NMF level-B harassment threshold of 160 dB re 1 μPa SPL_{rms} has been applied for piling for the area-based assessment in section 1.6 for bottlenose dolphin, grey seal and harbour seal features.</p>

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			<ul style="list-style-type: none"> – For harbour seal, the Wales and North West England MU was used, alongside consideration of connectivity presented in Carter <i>et al.</i> (2022) and telemetry data in the PEIR which screened in Strangford Lough SAC and Murlough SAC – There are no SACs within Isle of Man waters • Use of EDRs for HRA and removal of dose response Environmental Impact Assessment (EIA). • Feedback was received from NRW, Natural England and JNCC and all stakeholders agreed with the approach outlined above. 	
December 2023	NRW, JNCC, Natural England, Cefas, MMO, JNCC, TWT, IoM and Defra	EWG06 meeting	<p>Presented the UWSMS which focuses on the impacts of underwater sound for marine mammals and fish. The UWSMS will set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater sound following refined project design.</p> <p>Updates to HRA approach and screening areas were also presented:</p> <ul style="list-style-type: none"> • OSPAR Region III been considered to identify any additional sites with grey seal as a qualifying feature, which may have connectivity with the Morgan Generation Assets. Telemetry data has been used to screen out additional sites that did not show connectivity • Approach to the assessment of disturbance resulting from piling for harbour porpoise in the ISAA now presents both EDRs (15 km for pin piles) and area-based threshold approach (using 143 dB re 1 $\mu\text{Pa}^2\text{s SEL}_{ss}$). For all other species, the NMFS level-B harassment threshold of 160 dB re 1 $\mu\text{Pa SPL}_{rms}$ will be applied for piling alongside the relevant EDR (NMFS, 2005). 	<p>The Outline UWSMS (Document Reference J13) includes potential further mitigation options, should the measures in the MMMP (Document Reference J17) not reduce impacts, such that there will be no residual significant effect from the Morgan Generation Assets. The UWSMS is discussed in the Table 1.56 and discussed in the relevant sections throughout the assessment (piling and UXO).</p> <p>Further HRA assessment of the potential effects on SACs with marine mammal qualifying features is provided in section 1.6.</p> <p>The EDR approach has also been presented to assess impacts resulting from underwater sound associated with UXO detonation, for the Morgan Generation Assets alone (in section 1.6.4 and for the Morgan Generation Assets in-combination with other projects and plans (in section 1.6.5).</p>

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			<p>JNCC asked whether the EDR approach was used alongside TTS ranges to assess impacts resulting from underwater sound associated with UXO detonation and that this should be included if it is not currently presented in the assessment.</p>	
Benthic, fish and shellfish and physical processes				
November 2022	Natural England, NRW, MMO, JNCC, Cefas, IoM and TWT.	EWG02 meeting	<ul style="list-style-type: none"> • Approach to LSE Screening was discussed specifically, modelling predicted increases in Suspended Sediment Concentrations (SSC) and associated sediment deposition for construction activities for the Morgan Generation Assets to increase the evidence base for the screening of sites in the HRA Stage 1 Screening (Document Reference E1.4) for Annex II diadromous fish. • The approach to assigning sensitivity for herring was discussed. The approach used is in line with the Marine Evidence Based Sensitivity Assessment approach for EIA • The MMO advised in the Morgan Scoping Opinion that the sound threshold value of 145 dB SEL_{ss} from Hawkins and Popper (2016) should be considered. However, it was discussed that this approach would be highly precautionary given that the impulsive nature of the sound will dissipate and become continuous with distance from the source, the fact that response to sound does not necessarily mean avoidance and that the paper noted that experiments were undertaken in very quiet 	<p>As presented in the HRA Stage 1 Screening (Document Reference E1.4), the initial screening process identified no European sites with Annex I habitat features to be taken forward for determination of LSE. Therefore, no sites with Annex I habitat features have been included in this HRA Stage 2 ISAA – Part 2 SAC assessments (Document Reference E1.2).</p> <p>Discussion outputs concerning the approach to screening, including the use of the sound threshold value of 145 re 1 µPa²s SEL_{ss} have been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) (section 1.3.2, 1.3.3, and 1.4.3) and this HRA Stage 2 ISAA – Part 2 SAC assessments (Document Reference E1.2) in section 1.5.2 and 1.5.3.</p> <p>Specifically, the modelling of predicted increases in SSC and associated sediment deposition during construction has now been included in the HRA Stage 1 Screening (Document Reference E1.4), to refine the evidence base for the screening of sites for Annex II diadromous fish species. This modelling was used to inform the sites taken forward to the assessment in this HRA Stage 2 ISAA – Part 2 SAC</p>

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			<p>environments (in contrast to the Irish Sea). Also, the authors of the paper noted that this sound level should not be used to define sound exposure criteria. It was agreed that this metric would be presented in the EIA for some marine species (e.g. herring), although would not be adopted for impacts on diadromous fish.</p> <ul style="list-style-type: none"> A risk-based approach, considering both the spatial extent of the sound contours (assuming the maximum hammer energy) and the duration of piling (i.e. approx. 70 days) was provided. 	<p>assessments (Document Reference E1.2) in section 1.5.2 and 1.5.3.</p> <p>The Sound Exposure Guidelines for Fishes and Sea Turtles (Popper <i>et al.</i>, 2014) are considered to be the most relevant and best available guidelines for impacts of underwater sound on fish species. This has been used for the assessments in section 1.5.2 and 1.5.3.</p>
<p>March 2023</p>	<p>Natural England, NRW, MMO, JNCC, IoM, Cefas and TWT</p>	<p>EWG03 meeting</p>	<ul style="list-style-type: none"> The updated benthic ecology baseline was presented, including site specific surveys The increase in suspended sediment and sediment deposition for the Morgan Generation Assets was presented, which will be incorporated into physical processes modelling for PEIR The updated fish and shellfish baseline was presented, including the approach to assessing behavioural effects of fish and the underwater sound MDS For diadromous fish it was noted that from sound modelling, barrier effects are unlikely to occur. If using 160 dB re 1µPa Peak Sound Pressure Level (SPL_{pk}) as a guide, the contours show that even at the highest hammer energies there is negligible risk of barrier effects for diadromous fish. It should be noted these sound levels are likely to be highly conservative for salmon and lamprey, which are less sensitive to underwater sound The approach includes: for injury effects, using the Popper <i>et al.</i> (2014) thresholds for Group 2 fish species, and this is set out in the Underwater Sound Technical Report, (Document Reference F3.3.1) and the Fish and 	<p>Discussion outputs on the baseline characterisation for the Morgan Generation Assets have been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.1) (section 1.3.2, 1.3.3) and this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2) in section 1.5.2 and 1.5.3.</p> <p>The modelling of the impacts to diadromous fish species from elevated underwater sound are presented in section 1.5.2 and 1.5.3. For this assessment, the sound contours presented in Figure 1.3. This figure shows SACs with Annex II diadromous fish features with underwater sound SPL_{pk} 160 dB re 1µPa contours for the northeast piling location.</p>

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July 2023	Natural England, NRW, MMO, JNCC, IoM, Cefas and TWT	EWG04 meeting	<p>Shellfish PEIR. For behavioural effects, the report referred to a range of studies, but we have used the sound threshold value of 160 dB SPL_{pk} as a guide for considering whether there is potential for disruption of migration/barrier effects on diadromous fish.</p> <ul style="list-style-type: none"> • The Zone of Influence (Zoi) and benthic ecology updated baseline for the Morgan Array Area was presented • The fish and shellfish updated baselines was presented • The in-combination assessment for Morgan Generation Assets was discussed for EIA. It was noted that the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (hereafter referred to as the Transmission Assets) will be included as a separate section, so it clearly defines the impact of the Morgan Offshore Wind Project as a whole project 	<p>Discussion outputs on the baseline characterisation for the Morgan Generation Assets have been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.1) (section 1.3.2, 1.3.3) and this HRA Stage 2 ISAA Part 2 - SAC Assessments (Document Reference E1.2) in section 1.5.2 (alone assessment) and 1.5.3 (in-combination assessment).</p> <p>To ensure the Morgan Offshore Wind Project is assessed as a whole, the in-combination HRA assessment for the Morgan Generation Assets takes into account the impact associated with the Morgan Generation Assets together with the: Transmission Assets, the Morecambe Offshore Windfarm: Generation Assets (hereafter referred to as the Morecambe Generation Assets), and other projects and plans. These scenarios are outlined in section 1.4.5.</p>
December 2023	MMO, TWT, Cefas, NRW, JNCC, Natural England, IoM and Defra.	EWG06 meeting	<ul style="list-style-type: none"> • Provided the updates on the revised underwater sound assessment for Morgan Generation Assets. These involved removal of monopiles of the design envelope, reduced maximum hammer energy, and reduced hammer energies associated with concurrent piling scenarios. • Presented an overview of the outputs from updated underwater sound modelling for Morgan Generation, showing contour plots for SPL_{pk} and SEL_{ss} for Annex II diadromous fish species. 	<p>Discussion outputs, including updated sound modelling for Annex II diadromous fish and Annex II marine mammals is considered in section 1.5.2 and 1.5.3 (and section 1.6 for marine mammals; see marine mammal EWGs).</p> <p>The determination of sites for Appropriate Assessment has been made based on the updated assessment. These sites have been assessed (both alone and in-combination) in this HRA Stage 2 ISAA – Part 2 SAC assessments.</p> <p>The UWSMS is described in detail in this HRA Stage 2 ISAA – Part 2 SAC assessments, in Table 1.56.</p>

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			<ul style="list-style-type: none"> • The highly precautionary nature of the assessment was highlighted including the short-term nature of the piling phase, the high degree of intermittency and the use of the maximum potential hammer energies in the sound modelling. • Quantitative consideration of piling at multiple projects will be considered in the cumulative and in-combination assessments. • At PEIR concerns were raised with respect to bottlenose dolphin populations. Hence, the Applicant is looking to agree an approach to managing underwater sound impacts post consent, for which an UWSMS is being produced, which will also reduce impacts on other receptors. • The UWSMS would allow the projects to focus on underwater sound for multiple receptors (fish and marine mammals). An outline UWSMS will be submitted with the application and then developed post-consent to include further environmental information. It will also set out potential mitigation options which could be employed if there are any residual concerns about cumulative impacts of underwater sound. 	

S42 Consultation

Annex II diadromous fish

June 2023	Natural England	S42	<p>Natural England does not agree with the conclusions drawn that using soft start piling would enable highly mobile protected species (i.e. Salmon, Lamprey, Shad) to swim away from the source of noise. These traditional mitigation options were developed for receptors capable of moving away from a sound source (e.g. marine mammals) and so are not necessarily effective for fish.</p>	<p>The discussion outputs have been incorporated in the assessment of Adverse Effects on Integrity in this HRA Stage 2 ISAA Part 2 – SAC assessments in section 1.5.2 and 1.5.3. (fish section).</p> <p>It is acknowledged that soft start procedures may not be beneficial for all fish receptors, however, as fish are such a broad group of organisms, it is likely that soft starts will benefit some more reactive species, such as some of those groups 1 and 2 diadromous</p>
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				<p>fish species described. It has been clarified throughout that soft start procedures may benefit some fish species more than others. Soft start for piling work could be considered as assisting in mitigation against sound disturbance to these receptors during construction as it helps fish to move away from an area more than non-soft start piling. Further, soft start methods may also reduce the overall acoustic energy entering the marine environment.</p> <p>Notwithstanding the effectiveness of soft starts as mitigation for all fish receptors, the injury ranges associated with piling are relatively limited in extent and the assessment concluded that the risk of injury to diadromous fish species is low.</p> <p>Details of measures adopted for the Morgan Generation Assets relevant to Fish and shellfish ecology is presented in detail in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and in section 1.5.2: Assessment of adverse effects alone for Annex II diadromous fish for each relevant impact.</p>
June 2023	Natural England	S42	<ul style="list-style-type: none"> Impacts to sea and river lamprey behaviour. The unique trait of lamprey parasitism is not considered during the sensitivity discussion. Lamprey reliance on prey availability in the marine environment results in a heightened sensitivity to sound – on par with their prey. Should prey vacate the area due to underwater sound then this constitutes a predictable, negative impact to lamprey. Amend the sensitivity of lamprey. As impacts to diadromous fish overall are classed as minor adverse, this amendment will not affect the outcome of the assessment. 	<p>The discussion outputs have been incorporated in the assessment of Adverse Effects on Integrity in this HRA Stage 2 ISAA Part 2 – SAC assessments in section 1.5.2 and 1.5.3 (fish section). Further detail on Lamprey and their sensitivity to underwater sound is also included in Volume 2, Chapter 3: Fish and shellfish ecology Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)</p> <p>Impacts to Lamprey species in response to underwater sound have been assessed in section 1.5.2 and 1.5.3 for the relevant designated sites, which are shown in Table 1.6.</p>

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June 2023	Natural England	S42	<ul style="list-style-type: none"> • There is no evidence to suggest that fish move consistently and directionally from sound sources. Therefore soft-start cannot be considered an effective form of mitigation for fish receptors • When concurrent piling is considered and modelled, the Temporary Threshold Shift (TTS) ranges for fish modelled as stationary receptors have a maximum range of 32,340 m. The recovery period from TTS is variable, during which fish may have decreased fitness due to a reduced ability to communicate, detect predators or prey, and/or assess their environment. This overlaps with a significant portion of the Irish Sea and encompasses coarsely identified migratory routes • Further evaluation of sound impacts to migratory routes of diadromous fish • Utilisation of at-sea tracking information to improve impact assessment • Further discussion of mitigation/sound abatement technology may be necessary. 	<p>The discussion outputs have been incorporated in the assessment of Adverse Effects on Integrity in this HRA Stage 2 ISAA Part 2 – SAC assessments in section 1.5.2 and 1.5.3.</p> <p>It is acknowledged that soft start procedures are not beneficial for all fish receptors, however, as fish are such a broad group of organisms, it is likely that soft starts will benefit some more reactive species, such as some of those groups 1 and 2 diadromous fish species described. It will be clarified throughout that soft start procedures may benefit some fish species more than others. Soft start for piling work could be considered as assisting in mitigation against sound disturbance to these receptors during construction as it helps fish to move away from an area more than non-soft start piling.</p> <p>Impacts to Annex II fish species in response to underwater sound have been assessed in section 1.5.2 and 1.5.3 for the relevant designated sites.</p> <p>Details of mitigation for the Morgan Generation Assets relevant to Fish and shellfish ecology is presented in detail in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). and in section 1.5.2: Assessment of adverse effects alone for Annex II diadromous fish for each relevant impact.</p>
June 2023	Natural England	S42	<ul style="list-style-type: none"> • Underwater sound modelling considers cumulative Sound Exposure Level (SEL_{cum}) and TTS ‘fleeing’ receptors concurrently with ‘stationary’ receptors. Natural England does not agree with this behavioural response type due to a lack of empirical evidence. • Underwater modelling should be based solely on stationary receptor rather than a fleeing receptor for fish. 	<p>The discussion outputs have been incorporated in the assessment of Adverse Effects on Integrity in this HRA Stage 2 ISAA Part 2 – SAC assessments in section 1.5.2 and 1.5.3 (fish section).</p> <p>Impacts to Annex II fish species in response to underwater sound have been assessed in section 1.5.2 and 1.5.3 for the relevant designated sites.</p> <p>It is acknowledged that some fish species will exhibit moving away or ‘fleeing’ behaviour and some will not, therefore modelling is based on fish as both</p>

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June 2023	NRW	S42	<ul style="list-style-type: none"> NRW (A) agree with the conclusions of no adverse effects on site integrity for qualifying Annex II diadromous fish features on the Afon Gwyrfai a Llyn Cwellyn, Dee Estuary and River Dee and Bala Lake SACs. 	<p>static and fleeing receptors to capture both ends of the realistic spectrum.</p> <p>The discussion outputs have been incorporated in the assessment of Adverse Effects on Integrity in this HRA Stage 2 ISAA Part 2 – SAC assessments in section 1.5.2 and 1.5.3 (fish section).</p> <p>These agreements have helped to inform the conclusions of no Adverse Effects on Integrity for the listed SACs in section 1.5.2 and 1.5.3.</p>
Annex II marine mammals				
June	NRW	S42	<ul style="list-style-type: none"> NRW highlighted the use of sound mitigation strategies/attenuation technology such as bubble curtains, timing of piling (given North Anglesey Marine SAC is a summer site), and piling methods have not been proposed as potential mitigation methods Given the impact ranges calculated in Volume 3, Annex 3.1: Underwater sound technical report (Document Reference F3.3.1), NRW (A) strongly recommend that these are considered and included in any future mitigation plan. Whilst there is the potential that mitigation might not be formally required for the purposes of removing adverse effects on site integrity in the HRA or reducing significant effects in the EIA, it should be incorporated in accordance with industry best practice, to reduce effects in relation to European Protected Species including Annex II marine mammals. 	<p>The discussion outputs have been incorporated in the assessment of adverse effects on site integrity in this HRA Stage 2 ISAA Part 2 – SAC assessments in section 1.6.4 and 1.6.5.</p> <p>The Appropriate Assessment for North Anglesey Marine SAC indicated that no further measures are required to discount an Adverse Effect on Integrity . Notwithstanding, potential mitigations are being considered by the Applicant. The Applicant has committed to a UWSMS (as a significant effect from UXO clearance for harbour porpoise was concluded in the EIA (see Volume 2, Chapter 4 Marine mammals of the Environmental Statement (Document Reference F2.4)) to reduce the magnitude of impacts from underwater sound such that there is no significant effect in EIA terms. Potential mitigation options (if required) following project refinements post consent will be considered in the final UWSMS (which is not being submitted with the Application). An Outline UWSMS (Document Reference J13) will be submitted as part of the application and is secured within the deemed marine licences in the draft DCO (Document Reference C1) and expected to be secured within the marine licences. The Final UWSMS will be developed post-application through discussion and agreement with stakeholders.</p>

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				<p>The Applicant will continue to explore options for mitigating piling sound post consent, at a time when more detailed information is available (i.e. geotechnical data) and where further refinements to the Morgan Generation Assets detailed design have been made on this basis. Use of NAS will be considered as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate. Consequently, if NAS is required a detailed exploration of available technologies will be undertaken and information presented to demonstrate how such technology would contribute to the reduction in underwater sound from piling.</p>
June 2023	NRW	S42 Consultation	<ul style="list-style-type: none"> NRW (A) does not agree with the approach taken to assess the area disturbed for harbour porpoise. Only the EDR approach has been used for the assessment of disturbance associated with pile driving during the construction phase to assess impacts on harbour porpoise features in the North Anglesey Marine SAC. Based on the modelled contours provided in the PEIR, it is difficult to rule out absence of an adverse effect on the North Anglesey Marine SAC for the MDS of two simultaneous monopile drives. NRW (A) strongly advise that further information based on sound thresholds is provided, as we are currently unable to rule out an Adverse Effect on Integrity for harbour porpoise NRW (A) recommends that in addition / in parallel to EDRs, an unweighted sound threshold of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} (or a VHF-weighted 103 dB re 1 μPa SPL_{rms}) (Brandt <i>et al.</i>, 2018; Heinis <i>et al.</i>, 2019) should be used to represent the minimum fixed sound threshold at which significant disturbance would occur from impulsive sound sources. 	<p>In addition to EDRs, an unweighted sound threshold of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} has been presented to represent the minimum fixed sound threshold at which significant disturbance would occur from impulsive sound sources for impacts to harbour porpoise associated with piling (alone and In-combination) in section 1.6.4 and 1.6.5 of this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).</p>

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June 2023	NRW and Natural England	S42 Consultation	<ul style="list-style-type: none"> For harbour porpoise and bottlenose dolphin, Natural England and NRW did not agree with the densities used for PEIR For harbour porpoise, the site-specific density was substantially lower than more up to date densities For bottlenose dolphin, Natural England and NRW did not agree with the more complex approach of using dual densities (higher coastal density and lower offshore density). Furthermore, they did not recommend that water depth or distance from the coastline alone are used to predict density distributions since other factors need to be taken into consideration Natural England and NRW recommended the use of the Marine Mammal Atlas (Evans and Waggitt, 2023) to ensure that the most precautionary or the most scientifically robust values are taken forward to the assessment. 	The final densities used in the assessment for harbour porpoise and bottlenose dolphin (as presented in section 1.6.4 and 1.6.5 of this HRA Stage 2 ISAA – Part 2 SAC assessments) are based on the latest edition of the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) as agreed with Natural England and other stakeholders via the marine mammals EWG and therefore some densities are different than previously applied for PEIR.
June 2023	NRW	S42	NRW tentatively agreed that it may be unrealistic to assess injury and disturbance from vessel use by presenting a sum of the impact ranges of all vessels within each offshore windfarm, but highlighted no alternative method has been proposed to gauge the impact and advise that this impact pathway is adequately assessed.	A more detailed approach to assessing vessel sound has been included in detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) to give further quantification to the potential impacts. Empirical data has been gathered from field studies to determine realistic impact ranges and a quantification of the number of animals potentially affected based on densities of key Annex II species has been provided. In addition, further quantification of the baseline levels of activity (as provided in Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement (Document Reference F2.7) has been included to demonstrate the potential elevation in sound above background levels in the Morgan Array Area. This has been used to inform the assessment of adverse effects on the integrity of sites with

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June 2023	NRW	S42	NRW stated that based on the contours provided for PEIR, concurrent piling of monopiles at a maximum hammer energy of 5,000 kJ at the greatest spatial extent showing contours in 5 dB isopleths, it could be difficult to rule out an adverse effect on the North Anglesey Marine SAC for the MDS of two simultaneous monopiles.	designated marine mammal features from vessels in section 1.6.4 and 1.6.5. Monopiles have been removed from the Project Design Envelope (PDE), and the potential impact of pin piles on Annex II marine mammal species has been assessed in 1.6.4 and 1.6.5. The assessment for all SACs screened in for the elevated underwater sound due to piling (including North Anglesey Marine SAC) concluded No Adverse Effects on Integrity.
June 2023	NRW	S42	<ul style="list-style-type: none"> NRW recommended that the ratio of the impacted versus unimpacted population over a set period of time (for example the first six years, based on the former Favourable Conservation Status (FCS) reporting period), and the full 25-year modelled period are provided NRW (A) recommended the following approach to assessing the impact of disturbance on a population of marine mammals against conservation objectives, which relate to the population maintaining itself on a long-term basis. If, as a result of Permanent Threshold Shift (PTS) or disturbance, a population shows a continued decline of >1% per year (versus a modelled unimpacted reference population over, for example, the first six years since the start of piling) then there is a high likelihood that a significant effect and adverse effect on site integrity cannot be ruled out (NRW 2023). 	The discussion outputs have been incorporated in the assessment of adverse effects on site integrity in this HRA Stage 2 ISAA – Part 2 SAC assessments in section 1.6.4 and 1.6.5. Results from the iPCoD modelling at both six-year, and 25-year time periods (including predicted population declines, where relevant), are provided in detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). Key results from iPCoD modelling has been included for Annex II marine mammal species within the assessment of adverse effects on site integrity from the project alone (section 1.6.4) and the in-combination assessment (section 1.6.5) for elevated underwater sound during piling for harbour porpoise, bottlenose dolphin and grey seal. This includes reference to population effects for all species of relevance to the HRA Stage 2 ISAA – Part 2 SAC assessments.
June 2023	NRW	S42	NRW recommend that section 1.6 Assessment of Potential Adverse Effect on Integrity: Annex II marine mammals is amended for clarification. When consulted, for grey seal, NRW advised the use of the OSPAR Region III MU as per NRW's advice on the use of marine mammal MUs for screening and assessment in HRA for SACs with	The HRA Stage 1 Screening report (Document Reference E1.4) now considers European sites within the OSPAR Region III Interim MU designated for grey seal, however telemetry data from Wright and Sinclair (2022) has then been used to capture

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			<p>marine mammal features. NRW (A) agreed to the proposal to use the combined Wales MU, North West England MU, SW Scotland and Northern Ireland MU for grey seal in parallel with the OSPAR Region III MU. NRW (A) recommend that any similar statements within the document be amended. NRW (A) also agreed that the foraging ranges from Carter <i>et al.</i> (2022) would be a suitable alternative as this also captures the movement ranges of grey seal.</p>	<p>any SACs with potential connectivity to the Morgan Generation Assets.</p> <p>Any sites which were considered to have the potential for LSE were carried forward to this HRA Stage 2 ISAA – Part 2 SAC assessments. These sites are listed in Table 1.2. The assessment presented in this HRA Stage 2 ISAA – Part 2 SAC Assessments assesses the potential for an Adverse Effect on Integrity for these sites, according to the relevant qualifying features within these MUs. These assessments are presented in section 1.6.</p>
June 2023	NRW	S42 Consultation	<p>NRW (A) disagree that the extent of disturbance (from piling) is likely to be an overestimate due to impulsive sound losing its characteristics with range, particularly for harbour porpoise. We also recommend including reference to the Level B Harassment threshold for continuous sound of 120 dB Sound Pressure Level (SPL) rms.</p>	<p>The dose response is based on observed probability of a behavioural response during piling. Distance from an impulsive sound source is a strong predictor of a behavioural response. Characteristics of the sound far from the source are very different to the characteristics of the sound at source, and therefore likely to affect how a marine mammal perceives and reacts to sound (rather than just using sound level alone). The dose response curve from measurements taken at the Beatrice offshore wind farm was based on piling at much smaller maximum hammer energies and over distances not exceeding 60 km. Therefore, whilst the assessment applies the dose response as the best available estimate of proportional responses, it is considered to be highly conservative due to the propagation distances predicted for the Morgan Generation Assets which for a given sound level will not be equivalent in characteristics to those found at the Beatrice offshore wind farm.</p> <p>The assessment refers to the unweighted sound threshold of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} (from Tougaard, 2021) recommended by NRW which is based on a collation of field studies of harbour porpoise response to elevated subsea sound from piling. The unweighted sound threshold of 143 dB re</p>

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				<p>1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} represents the minimum fixed generalised response at which significant disturbance could occur. At ranges beyond the received level of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ (SEL_{ss}) the disturbance is likely to be 'mild' with less likelihood of active avoidance.</p>
June 2023	NRW	S42 response	<p>In section 1.6 and the Assessment of adverse effects alone, regarding the use of a more up to date peak seasonal density for harbour porpoise from the latest edition of the Marine Mammal Atlas (Evans and Waggitt, 2023), NRW (A) advise that any assessments of magnitude and significance, population modelling, and conclusions for harbour porpoise in the PEIR documents are revised with an updated density.</p>	<p>The peak seasonal density for harbour porpoise from the latest edition of the Marine Mammal Atlas (Evans and Waggitt, 2023) has been used within the HRA Stage 2 ISAA Part 2 - SAC Assessments (Document Reference E1.2) in section 1.6.</p>
June 2023	NRW	S42 Consultation	<p>NRW did not agree with the approach taken to assume that Mona Offshore Wind Project, the Morecambe Generation Assets, the Transmission Assets, North Irish Sea Array Offshore Wind Farm and Oriel Offshore Wind farm would not be expected to contribute to the impacts of bottlenose dolphin within the Irish Sea MU.</p>	<p>At the time of publication of the Morgan Generation Assets PEIR, the Morecambe Generation Assets PEIR was not available. The assessment, including iPCoD modelling, has been reviewed on the basis of the latest information at the time and therefore has included additional projects that have since released information into the public domain, including Mona Offshore Wind Project, Morecambe Generation Assets and the Transmission Assets. These projects are included in the in-combination assessment for marine mammals in section 1.6.5.</p>
June 2023	NRW	S42 Consultation	<ul style="list-style-type: none"> NRW suggested the use of MUs as the appropriate screening distance was not always followed when screening in projects for the assessment of potential in-combination effects on marine mammals For grey seal, with regard to the MU, reference should be made to the OSPAR Region III interim MU and the relevant NRW position statement (NRW, 2023) NRW requested consideration of the whole OSPAR Region III for screening of cumulative 	<p>For the purpose of the in-combination assessment presented in section 1.6.5 for marine mammals, screening of projects was undertaken within the relevant species MUs with the maximum extent delineated by the CIS, as suggested by NRW.</p> <p>With respect to grey seal an extended screening area was applied following specific feedback from the EWG and included projects within OSPAR Region III Taking a proportionate approach, only offshore wind projects were screened across this</p>

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Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			<p>projects with respect to grey seal only. Regard should be made to the OSPAR Region III interim MU and the relevant NRW position statement (NRW, 2023)</p> <ul style="list-style-type: none"> • NRW and JNCC also suggested the two populations of bottlenose dolphins (Irish Sea MU (IS MU) and Offshore Channel and Southwest England MU (OCSE MU) will need to be assessed separately due to being part of separate MUs • NRW also recommended for screening in projects for the assessment of injury and disturbance from pre-construction site investigation surveys, all projects that fall within that MU should be screened in (rather than the approach of using the maximum impact ranges). 	<p>larger in-combination study area. This approach is in line with NRW's position statement (NRW, 2023).</p> <p>For grey seal for both the alone assessment and the in-combination assessment (sections 1.6.4 and 1.6.5), reference has been made to the OSPAR Region III interim MU. The use of telemetry data from Wright and Sinclair (2022) in addition to Seal Management Units (SMU) is deemed sufficient to capture any SACs with potential connectivity to the Morgan Generation Assets.</p> <p>For bottlenose dolphin the approach agreed in the marine mammal EWG with NRW was to consider cumulative projects only within the Irish Sea MU and therefore the Offshore Channel and Southwest England MU is no longer included within the cumulative study area for this species.</p> <p>For site-investigation surveys, screening used the species-specific areas (rather than the maximum modelled impact ranges derived from the underwater sound modelling assessment used in PEIR) and used a proportionate number to assume how many surveys will occur at the same time. Justification of approach has been provided in detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). This approach was agreed in the marine mammal EWG with NRW.</p> <p>Natural England and MMO had no objections to the approach adopted following NRW's feedback.</p> <p>The approach to the in-combination assessment in section 1.6.5 has been checked and aligned with this advice. For Tier 2 projects where the relevant information is not publicly available it has not been possible to include these in population modelling. These Tier 2 projects will carry out their own modelling at a point where project specific data are available, and the Morgan Generation Assets will be considered in these project's IPCoD model. All Tier 1</p>

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June 2023	NRW	S42 response	<ul style="list-style-type: none"> Further clarification required/further assessment required to support conclusions on in-combination effects on underwater sound. With reference to the assessment of adverse effects in-combination, it is unclear whether all Tier 1 and Tier 2 projects have been considered for the assessment of in-combination injury and disturbance from underwater sound generated during piling, and whether the contribution to disturbance from all projects was considered in the IPCoD modelling NRW (A) would recommend inclusion of Project Valorous into the list of Tier 2 projects. 	<p>and Tier 2 projects which have quantitative information available in the public domain have been included in the IPCoD model.</p> <p>With regard to the marine mammal in-combination assessment, some Tier 2 projects could not be included in population modelling as numbers of species impacted are required which are not provided in the respective scoping reports. If information is publicly available, projects are included. The HRA Stage 2 ISAA – Part 2 SAC assessments has been aligned with Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).</p> <p>The approach to the in-combination has been updated since PEIR to consider three Scenarios, as described in section 1.6.5. This approach clarifies where Tier 1, Tier 2 and Tier 3 projects have been assessed for in-combination effects for marine mammals in section 1.6.5. This was presented to the EWG in a technical note, included in the Technical Engagement Plan Appendices Part 1 (A to E) (Document Reference E4.1).</p> <p>Project Valorous has been considered in assessments in Tier 3 in section 1.6.5, where relevant.</p>
June 2023	NRW	S42 responses	<ul style="list-style-type: none"> Further evidence required to support the in-combination assessment. NRW (A) recommend using the results from IPCoD modelling when assessing impacts of disturbance on a population against conservation objectives related to the population maintaining itself on a long term basis. However, these results could also inform and strengthen conclusions made for harbour porpoise For assessing cumulative effects from piling, NRW (A) recommend the methodology used in 	<p>The position statement (NRW, 2023) has been reviewed and the assessment within Volume 2, Chapter 4: Marine mammals of the Environmental Statement and the HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2) has been updated where required. The results from IPCoD modelling have been presented when assessing impacts of disturbance on a population against conservation objectives.</p> <p>Results from population modelling have been incorporated into the assessment of marine</p>

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			<p>Scottish National Heritage Report 1081 (Carter <i>et al.</i>, 2019) as an example.</p>	<p>mammals in section 1.6.5 (In-combination assessment), where relevant.</p> <p>All Tier 2 projects cannot be included in population modelling as numbers of species impacted are required which are not provided in the relevant scoping reports. This has been noted in section 1.6.5.</p>
June 2023	NRW	S42 responses	<p>Further evidence required to support conclusions regarding impacts as a result of changes to prey availability. With reference to the assessment of adverse effects in-combination, a conclusion of no adverse effect has been predicted, based on the assumption that the absence of prey will not impact marine mammals since they would also be displaced to potentially greater distances. However, this conclusion is dependent on recovery time of both receptors and no evidence regarding the length of time for fish species to return to the displaced area has been provided.</p>	<p>Further detail has been provided to justify the conclusions of the assessment throughout Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) and this has been carried over to the HRA Stage 1 Screening report (Document Reference E1.4) and HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2) where necessary.</p>

1.3 Summary of HRA stage 1 screening conclusions

1.3.1.1 This section summarises all pathways identified for potential LSE (arising alone and/or in-combination) and defines the scope of the Stage 2 assessments within this HRA Stage 2 ISAA Part 2 – SAC assessments.

1.3.1 Screening outcomes for the Morgan Generation Assets alone

1.3.1.1 The potential for LSE as a result of the Morgan Generation Assets alone has been identified following HRA Stage 1 Screening Report (Document Reference E1.4) with respect to 42 SACs.

Annex II diadromous fish

1.3.1.2 The following nine European sites designated for Annex II diadromous fish were advanced to the HRA Stage 2 ISAA Part 2 – SAC assessments:

- River Ehen SAC
- Dee Estuary/Aber Dyfrdwy SAC
- River Derwent and Bassenthwaite Lake SAC
- River Kent SAC
- Solway Firth SAC
- River Bladnoch SAC
- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC
- Afon Gwyrfai a Llyn Cwellyn SAC.
- River Eden SAC.

Annex II marine mammals

1.3.1.3 A total of 33 European sites were advanced to the HRA Stage 2 ISAA Part 2 – SAC assessments for Annex II marine mammals. These sites are listed below, broken down by country:

- Twelve sites in the United Kingdom:
 - North Anglesey Marine/Gogledd Môn Forol SAC
 - North Channel SAC
 - Strangford Lough SAC
 - Murlough SAC
 - Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC
 - West Wales Marine/Gorllewin Cymru Forol SAC
 - The Maidens SAC
 - Cardigan Bay/Bae Ceredigion SAC
 - Pembrokeshire Marine/Sir Benfro Forol SAC
 - Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC
 - Lundy SAC

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- Isles of Scilly Complex SAC
- Four sites in Ireland:
 - Rockabill to Dalkey Island SAC
 - Saltee Islands SAC
 - Roaringwater Bay and Islands SAC
 - Blasket Islands SAC
- Seventeen sites in France:
 - Chaussée de Sein SCI
 - Mers Celtiques - Talus du golfe de Gascogne SCI
 - Abers - Côte des legends SCI
 - Ouessant-Molène SCI
 - Côte de Granit rose-Sept-Iles SCI
 - Anse de Goulven, dunes de Keremma SCI
 - Tregor Goëlo SCI
 - Côtes de Crozon SCI
 - Cap Sizun SCI
 - Récifs du talus du golfe de Gascogne SCI
 - Anse de Vauville SCI
 - Cap d'Erquy-Cap Fréhel SCI
 - Baie de Saint-Brieuc – Est SCI
 - Banc et récifs de Surtainville SCI
 - Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI
 - Estuaire de la Rance SCI
 - Baie du Mont Saint-Michel SCI.

1.3.2 LSE in-combination

LSE in-combination for Annex II diadromous fish species

- 1.3.2.1 A precautionary approach to the selection of relevant sites for Annex II diadromous fish was adopted in the LSE screening in order to capture all sites with the potential for connectivity with the Morgan Generation Assets, and in particular to consider the potential for disruption to migration (i.e. barriers to migration) of diadromous fish (including but not limited to Atlantic salmon *Salmo salar*) to/from natal rivers (river of origin). For the purposes of LSE screening, a precautionary approach was adopted using a preliminary buffer of 100 km from the Morgan Array Area for all Annex II diadromous fish species except Atlantic salmon and freshwater pearl mussel *Margaritifera margaritifera* where the regional area has been considered. These screening buffers take into account the likely migratory routes and distances for diadromous fish as outlined in ABPmer (2014), and follow the methodology outlined in the Plan Level HRA (TCE, 2022), in line with feedback from stakeholders.

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1.3.2.2 No potential impact pathways were identified between the Morgan Generation Assets and any additional sites designated for Annex II diadromous fish, therefore there is no potential for in-combination effects at any sites apart from those which are screened in for the HRA Stage 2 ISAA Part 2 – SAC assessments (see Table 1.2).

LSE in-combination for Annex II marine mammals

1.3.2.3 A precautionary approach to the selection of relevant sites for Annex II marine mammals was adopted in the LSE screening. As marine mammals are highly mobile animals with the potential to forage over wide areas, all European sites for marine mammal features with a range that overlaps with the Morgan Generation Assets were considered.

1.3.2.4 For Annex II cetaceans (harbour porpoise *Phocoena phocoena* and bottlenose dolphin *Tursiops truncatus*) the search area extended to the relevant MU for each species, as defined by the Inter Agency Marine Mammal Working Group (IAMMWG, 2015). For harbour seal *Phoca vitulina* and grey seal *Halichoerus grypus*, SACs located within the same Seal MU (SMU) (Special Committee on Seals (SCOS), 2022 in parallel with the OSPAR Region III MU, as well as recent sources on seal foraging ranges (Carter *et al.*, 2022) and telemetry data presented in Appendix 2 of Volume 4, Annex 4.1: Marine mammals technical report of the Environmental Statement (Document Reference F4.4.1), (Wright and Sinclair, 2022) were considered. This approach is in line with feedback from stakeholders via the marine mammals EWG (see Table 1.1).

1.3.2.5 Potential for LSE alone has been identified for all UK sites within species' range, therefore in-combination effects for these sites have been assessed in this HRA Stage 2 ISAA.

1.3.2.6 For potential impacts discounted for LSE alone, there is either no pathway to effect, or the Morgan Generation Assets would result in only negligible or inconsequential effects that would not contribute (even collectively with other projects or plans) in a material way to in-combination effects. Therefore, where an impact has been screened out for LSE alone, it has also been screened out for in-combination effects.

1.3.3 Summary table of LSE screening outcomes

1.3.3.1 Table 1.2 presents a summary of the European sites and relevant qualifying features for which LSE could not be ruled out and therefore an Appropriate Assessment is required to be undertaken.

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Table 1.2: A summary of all European sites for which the potential for LSE could not be discounted at Stage 1 screening stage, and for which Appropriate Assessment is required.

European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
River Ehen SAC	62.5	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> Electromagnetic Field (EMF) from subsea electrical cabling In-combination effects.
		Freshwater pearl mussel <i>Margaritifera margaritifera</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
Dee Estuary/Aber Dyfrdwy SAC	70.1	Sea lamprey <i>Petromyzon marinus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
		River lamprey <i>Lampetra fluviatilis</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
River Derwent and Bassenthwaite SAC	71.2	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
			Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
		Sea lamprey <i>Petromyzon marinus</i>	Operations and maintenance	<ul style="list-style-type: none"> In-combination effects. EMF from subsea electrical cabling In-combination effects.
			River lamprey <i>Lampetra fluviatilis</i>	Construction/decommissioning
		Operations and maintenance		<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
		River Kent SAC	80.9	Freshwater pearl mussel <i>Margaritifera margaritifera</i>
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
Solway Firth SAC	84.7	Sea lamprey <i>Petromyzon marinus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
		River lamprey <i>Lampetra fluviatilis</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
River Bladnoch SAC	89.8	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
	92.4		Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid SAC		Atlantic salmon <i>Salmo salar</i>		<ul style="list-style-type: none"> In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
		Sea lamprey <i>Petromyzon marinus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
		River lamprey <i>Lampetra fluviatilis</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
Afon Gwyrfai a Llyn Cwellyn SAC	117.9	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
River Eden SAC	125.6	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
		Sea lamprey <i>Petromyzon marinus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects.
			Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
		River lamprey <i>Lampetra fluviatilis</i>	Operations and maintenance	<ul style="list-style-type: none"> In-combination effects. EMF from subsea electrical cabling In-combination effects.
North Anglesey Marine/Gogledd Môn Forol SAC	28.2	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound during piling Injury and disturbance from elevated underwater sound during Unexploded Ordnance (UXO) clearance Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities Changes in fish and shellfish communities affecting prey availability (construction only) In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects.
North Channel SAC	64.0	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound during piling Injury and disturbance from elevated underwater sound during UXO clearance Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects.

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Strangford Lough SAC	94.7	Harbour seal <i>Phoca vitulina</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Murlough SAC	98.4	Harbour seal <i>Phoca vitulina</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
Pen Llŷn a'r Sarnau/Lleyr Peninsula and the Sarnau SAC	119.7	Bottlenose dolphin <i>Tursiops truncatus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • In-combination effects. • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
		Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
West Wales Marine/Gorllewin Cymru Forol SAC	121.0	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
The Maidens SAC	142.0	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Cardigan Bay/Bae Ceredigion SAC	188.1	Bottlenose Dolphin	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
		<i>Tursiops truncatus</i>		<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	
		<i>Grey seal Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	
Pembrokeshire Marine/Sir Benfro Forol SAC	237.3	<i>Grey seal Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
				<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC	300.5	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Lundy SAC	335.1	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
				<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Isles of Scilly Complex SAC	464.9	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
Rockabill to Dalkey Island SAC	123.4	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Saltee Islands SAC	259.5	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Roaringwater Bay and Islands SAC	472.9	Harbour Porpoise	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
		<i>Phocoena phocoena</i>		<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
Blasket Islands SAC	589.6	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
17 French Sites <ul style="list-style-type: none"> • Mers Celtiques - Talus du golfe de Gascogne SCI 	See HRA Stage 1 Screening Report (Document Reference E1.4)	Harbour Porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
<ul style="list-style-type: none"> • Abers - Côte des legends SCI • Ouessant-Molène SCI • Côte de Granit rose-Sept-Iles SCI 				<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.
<ul style="list-style-type: none"> • Anse de Goulven, dunes de Keremma SCI • Tregor Goëlo SCI • Côtes de Crozon SCI • Chaussée de Sein SCI • Cap Sizun SCI • Récifs du talus du golfe de Gascogne SCI • Anse de Vauville SCI • Cap d'Erquy-Cap Fréhel SCI • Baie de Saint-Brieuc – Est SC • Banc et récifs de Surtainville SCI • Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI 			Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.

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European site	Distance to Morgan Array Area (km)	Relevant qualifying features	Project phase	Impact
<ul style="list-style-type: none"> Estuaire de la Rance SCI Baie du Mont Saint-Michel SCI. 				

1.4 Information to Support the Appropriate Assessment

1.4.1 Maximum design scenarios

1.4.1.1 For all European sites considered in this HRA Stage 2 ISAA Part 2 – SAC assessments, the assessments have been based on a realistic MDS. Each MDS has been derived from the design envelope for the Morgan Generation Assets and is presented within the relevant receptor chapters. The Morgan Generation Assets 'envelope' has been designed to include flexibility (e.g. changes to the infrastructure layout), to accommodate further project refinement during detailed design, post consent. The MDS represents the worst case that could potentially be built and is selected on a topic-by-topic and impact-by-impact basis and assessed. Volume 1, Chapter 3: Project description of the Environmental Statement (Document Reference F1.3) describes the Morgan Generation Assets design and identifies the range of potential parameters for all relevant components. A summary of the Morgan Generation Assets design is also included in the HRA Stage 2 ISAA – Part 1 Introduction (Document Reference E1.1).

1.4.1.2 The MDS for each of the potential impacts for each receptor group are tabulated separately in each of the receptor sections of this HRA Stage 2 ISAA – Part 2 SAC assessments, according to the effect-pathway under consideration. The assessment scenarios are consistent with those used for assessment in relevant chapters of the Environmental Statement.

1.4.1.3 The MDSs identified in this HRA Stage 2 ISAA Part 2 – SAC assessments have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the design envelope provided in Volume 1, Chapter 3: Project description of the Environmental Statement (Document Reference F1.3). The final design will be within the scope of that design envelope and will result in no greater adverse environmental effects than those set out in this HRA Stage 2 ISAA. Details of the project design are included in Volume 1, Chapter 3: Project description of the Environmental Statement (Document Reference F1.3).

1.4.2 Measures adopted as part of the Morgan Generation Assets

1.4.2.1 An iterative approach to the Morgan Generation Assets EIA and HRA process has been utilised to inform the Morgan Generation Assets design (through the identification of LSEs and development of measures to address these). This is explained in more detail in Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement (Document Reference F1.5). The incorporation of such measures within the design of the Morgan Generation Assets demonstrates commitment to implementing the identified measures.

1.4.2.2 The term 'measures adopted as part of the Morgan Generation Assets' is used in this HRA Stage 2 ISAA Part 2 – SAC assessments to include the following measures (adapted from IEMA, 2016):

- Measures included as part of the project design. These include modifications to the location or design envelope of the Morgan Generation Assets which are integrated into the application for consent. These measures are secured through the consent itself through the description of the development and the

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parameters secured in the Development Consent Order (DCO) and/or marine licences (referred to as primary mitigation in IEMA (2016))

- Measures required to meet legislative requirements, or actions that are generally standard practice used to manage commonly occurring environmental effects and are secured through the DCO requirements and/or the conditions of the marine licences (referred to as tertiary mitigation in IEMA (2016)).

1.4.3 Baseline information

1.4.3.1 Baseline information on the European sites identified for further assessment within this HRA Stage 2 ISAA Part 2 – SAC assessments has been gathered through a comprehensive desktop study of existing studies and datasets. The key data sources are summarised in each of the receptor group sections below and presented in detail within topic chapters in the Environmental Statement. Any additional sources of information used in this HRA Stage 2 ISAA Part 2 – SAC assessments are also summarised. The key baseline data sources, for each receptor, are outlined below:

- Annex II diadromous fish – informed by Volume 4, Annex 3.1: Fish and shellfish ecology technical report of the Environmental Statement (Document Reference F4.3.1) and Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)
- Annex II marine mammals – informed by the 24 month site-specific aerial survey data and baseline characterisation presented in Volume 4, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference F4.4.1) and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)

1.4.3.2 For brevity, information on the European sites is summarised within the main body of this HRA Stage 2 ISAA – Part 2 SAC assessments.

1.4.4 Conservation objectives and advice

1.4.4.1 The SNCBs have produced conservation advice for European sites under their statutory remit. This conservation advice provides supplementary information on sites and features, and although the content provided is similar, the format of the advice provided varies between the different SNCBs.

1.4.4.2 Conservation objectives set the framework for establishing appropriate conservation measures for each feature of the site and provide a benchmark against which plans or projects can be assessed. The conservation objectives set out the essential elements needed to ensure that a qualifying habitat or species is maintained or restored at a site. If all the conservation objectives are met, then the integrity of the site will be maintained, and deterioration or significant disturbance of the qualifying features avoided.

1.4.4.3 In this HRA Stage 2 ISAA Part 2 – SAC assessments, the Applicant has referenced the most up-to-date conservation objectives and conservation advice available. It is recognised that in the conservation advice documents, if any feature of the SAC is in unfavourable condition, the integrity of the site is deemed to be compromised and the overarching objective is therefore to restore site integrity.

1.4.4.4 Due to the location and scale of the Morgan Generation Assets, European sites with the potential to be impacted fall variously under the remit of Natural England, NRW, NatureScot, National Parks and Wildlife Service (NPWS), the JNCC and Office Français de la Biodiversité.

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- 1.4.4.5 Natural England has published a suite of ‘European Site conservation objectives: Supplementary advice on conserving and restoring features’ documents. These documents present attributes which are ecological characteristics of the designated species and habitats within a site. Each attribute has a target which is either quantified or qualitative depending on the available evidence. Targets are also listed for the desired state to be achieved for the attribute.
- 1.4.4.6 For Welsh sites including the Llyn Peninsula and the Sarnau/Pen Llŷn a'r Sarnau SAC, Cardigan Bay/Bae Ceredigion SAC and the Pembrokeshire Marine/Sir Benfro Forol SAC, conservation advice has been developed by NRW in the form of a ‘Regulation 37 Document’.
- 1.4.4.7 For some European sites under the statutory remit of NatureScot, NRW and/or Natural England, Conservation Advice Packages (CAP) have been produced. However, the SNCBs are still progressing the development of these packages and only a limited number of European sites have CAPs to date. Of the European sites screened into this HRA Stage 2 ISAA Part 2 – SAC assessments, a CAP has only been produced for the River Bladnoch SAC; CAP for other European sites have not yet been produced. This CAP contains revised and updated conservation objectives for the features of the site, site-specific clarifications, advice for the conservation objectives to be achieved, and advice on operations with the potential to affect the conservation objectives. The Solway Firth SAC CAP is currently being jointly developed by Natural England and NatureScot but has not yet been published.
- 1.4.4.8 For European sites located within the Republic of Ireland there are currently no CAP. However, conservation objectives have been published for all sites and these have been considered within this HRA Stage 2 ISAA Part 2 – SAC assessments.
- 1.4.4.9 For European sites which fall within both Welsh and English or English and Scottish territorial waters the two relevant governing SNCBs can publish separate conservation objectives for the same European site. For example, both Natural England and NRW have published conservation objectives for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Where this is the case for European sites assessed within this HRA Stage 2 ISAA Part 2 – SAC assessments, the most recently published conservation objectives have been used. Following S42 consultation responses from NRW on the agreed conservation objectives for the Dee Estuary/Aber Dyfrdwy SAC, the Natural England and Countryside Council Wales (CCW) (2010) conservation objectives have been used within this HRA Stage 2 ISAA Part 2 – SAC assessments, see Table 1.1.

1.4.5 Approach to the in-combination assessments

- 1.4.5.1 The Habitats Regulations require the consideration of the potential effects of a project on European sites both alone and in-combination with other plans or projects.
- 1.4.5.2 When undertaking an in-combination assessment, projects, plans or activities with which the Morgan Generation Assets may interact to produce an in-combination effect must be identified. These interactions may arise within the construction, operations and maintenance or decommissioning phases. The process of identifying those projects, plans or activities for which there is the potential for an interaction to occur is referred to as ‘screening’.
- 1.4.5.3 A specialised process has been developed in order to methodically and transparently screen the large number of projects, plans and activities that may be considered cumulatively alongside the Morgan Generation Assets. This involves a staged process that considers the level of detail available for projects, plans and activities, as well as the potential for interactions on a conceptual, physical and temporal basis.

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- 1.4.5.4 The projects, plans and activities screened into the in-combination assessment have been consulted upon with the SNCBs through this HRA Stage 2 ISAA – Part 2 SAC assessments to seek agreement on the projects, plans and activities to be considered in the in-combination assessment.
- 1.4.5.5 The in-combination assessment has taken into account the impact associated with the Morgan Generation Assets together with the Transmission Assets, the Morecambe Offshore Windfarm Generation Assets and other projects and plans. The projects and plans selected as relevant to the in-combination assessment are presented in this HRA Stage 2 ISAA – Part 2 SAC assessments, based on the results of the screening exercises for fish and shellfish ecology and marine mammals (as presented in Volume 2, Chapter 3: Fish and shellfish ecology (Document Reference F2.3) and Chapter 4: marine mammals (Document Reference F2.4) of the Environmental Statement). Each project has been considered on a case-by-case basis for screening in or out of the assessment based upon data confidence, effect-receptor-pathways and the spatial/temporal scales involved.
- 1.4.5.6 The in-combination effects assessment has followed the methodology set out in Volume 1, Chapter 5: EIA methodology of the Environmental Statement which considers three Scenarios:
- Scenario 1: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets
 - Scenario 2: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm Generation Assets
 - Scenario 3: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside all other projects, plans and activities. This assessment has been allocated into ‘tiers’ reflecting the current stage of the other projects, plans and activities within the planning and development process. This tiered approach is adopted to provide a clear assessment of the Morgan Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside other projects, plans and activities.
- 1.4.5.7 This approach provides a framework for placing relative weight on the potential for each project/plan to be included in the in-combination assessment to ultimately be realised, based upon the project/plan’s current stage of maturity and certainty in the project’s parameters. The allocation of each project, plan and activity into tiers is not affected by the screening process but is merely a categorisation applied to all projects, plans and activities that have been screened in for assessment.
- 1.4.5.8 The tiered approach uses the following categorisations:
- Tier 1
 - Under construction
 - Permitted application
 - Submitted application
 - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact
 - Tier 2
 - Scoping report has been submitted and is in the public domain

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- Tier 3
 - Scoping report has not been submitted or is not in the public domain
 - Identified in a relevant development plan
 - Identified in other plans and programmes.

1.4.5.9 An overview of the projects or activities considered for each receptor group are tabulated separately in each of the receptor chapters according to the effect-pathway under consideration.

1.5 Assessment of potential Adverse Effect on Integrity: Annex II diadromous fish species

1.5.1.1 The HRA Stage 1 Screening Report (Document Reference E1.4) identified the potential for LSEs on the following European sites designated for Annex II fish features and freshwater pearl mussel (Figure 1.1):

- River Ehen SAC
- Dee Estuary/Aber Dyfrdwy SAC
- River Derwent and Bassenthwaite Lake SAC
- River Kent SAC
- Solway Firth SAC
- River Bladnoch SAC
- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC
- Afon Gwyrfai a Llyn Cwellyn SAC
- River Eden SAC.

1.5.1.2 LSEs on these European sites were identified for the following impacts:

- During the construction and decommissioning phases
 - Underwater sound
 - In-combination effects
- During the operations and maintenance phase
 - EMF from subsea electrical cabling
 - In-combination effects.

1.5.1.3 The European sites and relevant Annex II diadromous fish features for which the potential for LSE could not be ruled out in the HRA Stage 1 Screening (Document Reference E1.4) are listed in Table 1.3.

Table 1.3. European sites and relevant Annex II diadromous fish features for which the potential for LSE could not be ruled out and therefore considered in the HRA Stage 2 ISAA.

SAC	Annex II diadromous fish features
River Ehen SAC	<ul style="list-style-type: none"> • Atlantic salmon • Freshwater pearl mussel
Dee Estuary/Aber Dyfrdwy SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey
River Derwent and Bassenthwaite Lake SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon
River Kent SAC	<ul style="list-style-type: none"> • Freshwater pearl mussel
Solway Firth SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey

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SAC	Annex II diadromous fish features
River Bladnoch SAC	<ul style="list-style-type: none"> • Atlantic salmon
River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon
Afon Gwyrfai a Llyn Cwellyn SAC	<ul style="list-style-type: none"> • Atlantic salmon
River Eden SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon

1.5.1.4 This section presents the HRA Stage 2 Appropriate Assessments (considering effects both alone and in-combination) for the sites listed in Table 1.3. A summary of all Appropriate Assessments undertaken within this report is provided in the concluding section of this report (section 1.7). Freshwater pearl mussel has been considered within this chapter (specifically as a qualifying feature of the River Ehen SAC and River Kent SAC) because part of its life stage is reliant on salmonid species such as Atlantic salmon and sea trout *Salmo trutta*. The potential for adverse effects to freshwater pearl mussel, if they occur at all, would be indirect and would occur as a result of direct effects on Atlantic salmon or sea trout, which are relevant host species for freshwater pearl mussel within the SACs assessed.

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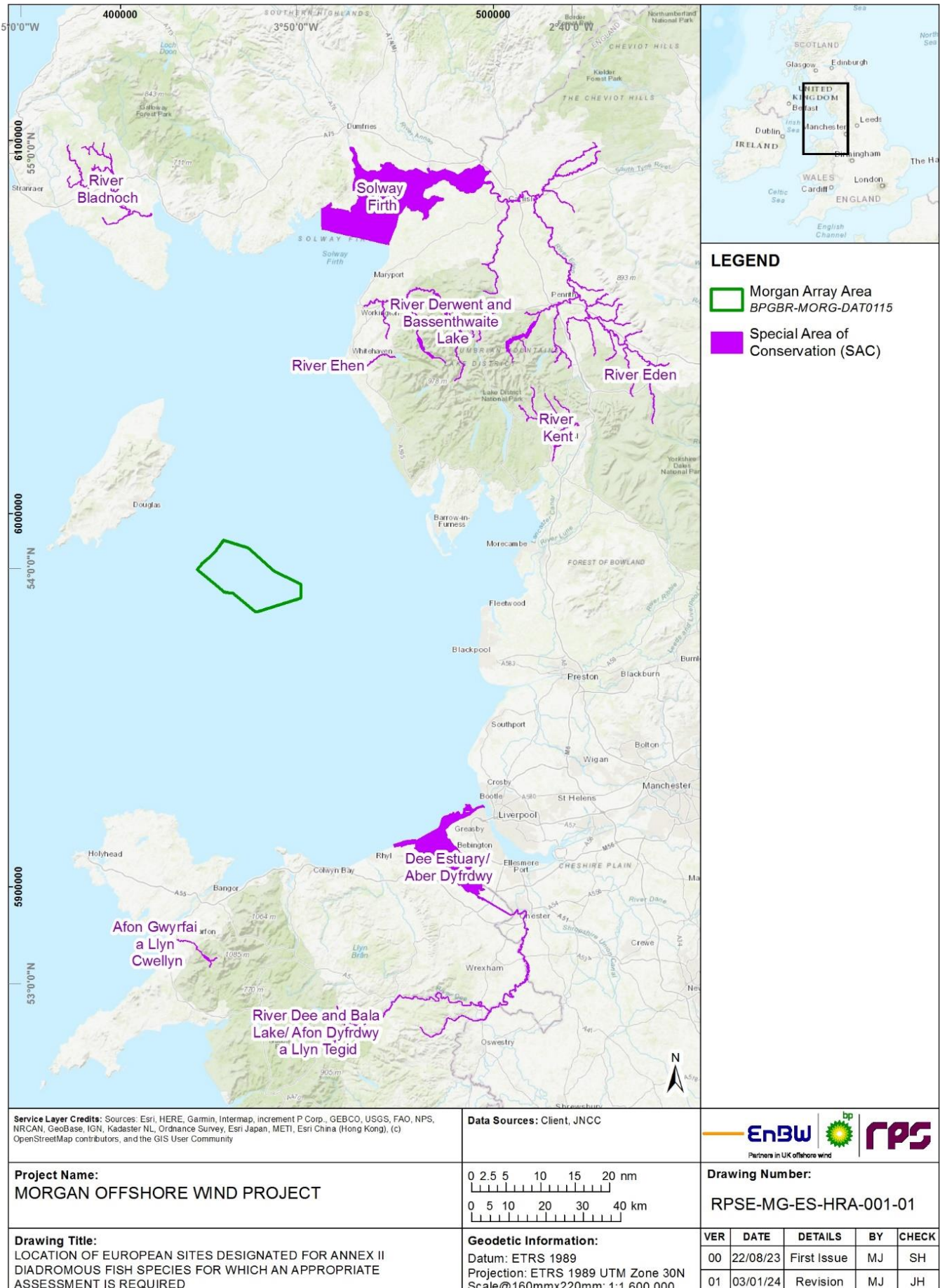


Figure 1.1: Locations of European sites designated for Annex II diadromous fish features for which an Appropriate Assessment is required.

1.5.1 Baseline information

1.5.1.1 Baseline information on the Annex II diadromous fish features of the European sites identified for further assessment within the HRA process has been gathered through a comprehensive desktop study of existing studies and datasets, using the latest available information on diadromous fish. Full details are presented within Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and Volume 4, Annex 3.1: Fish and shellfish technical report of the Environmental Statement (Document Reference F4.3.1).

River Ehen SAC

Site description

1.5.1.2 The River Ehen SAC, which is 62.5 km from the Morgan Generation Assets, forms the outfall from Ennerdale Water and flows some 20 km to Sellafield where it meets the Irish Sea. The SAC is located between Ennerdale Water and the convergence with the River Keekle. This part of the river supports outstanding populations of the freshwater pearl mussel of which is the primary reason for the selection of the site. These populations likely result from high amount of tree shade along the banks, which is thought to be of importance for mussel habitat (Natural England, 2019). The SAC is also designated for Atlantic salmon which is present as a qualifying feature but not a primary reason for site selection and plays an important role in the lifecycle of the freshwater pearl mussel (Natural England, 2019).

Feature accounts

Freshwater pearl mussel

1.5.1.3 The freshwater pearl mussel is an endangered species of freshwater mussel. It is widely distributed in Europe but has suffered widespread decline and is highly vulnerable in every part of its former range. A Scottish national survey undertaken in 2015 found that freshwater pearl mussel had been lost from a number of rivers. More widely, since 1999 a total of 11 rivers in Scotland have seen their freshwater pearl mussel populations become extinct (JNCC, 2022a).

1.5.1.4 Freshwater pearl mussel are similar in shape to common marine mussels but grow much larger and live far longer. They can grow as large as 20 cm and live for more than 100 years, making them one of the longest-lived invertebrates (Skinner *et al.*, 2003). These mussels live on the beds of clean, fast flowing rivers, where they can be buried partly or wholly in coarse sand or fine gravel. Mussels have a complex life cycle, living on the gills of young Atlantic salmon or sea trout, for their first year, without causing harm to the fish (Skinner *et al.*, 2003). While there is no potential for direct impacts on this species from the Morgan Generation Assets (as this is an entirely freshwater species), indirect impacts may occur due to effects on their host species (i.e. Atlantic salmon and sea trout) during their marine phase.

1.5.1.5 The River Ehen supports the largest freshwater pearl mussel population (>100,000) in England with high densities of greater than 100 m² found in some locations. The conservation importance of the site is further enhanced by the presence of juvenile pearl mussels, indicating recruitment since 1990 (JNCC, 2022a).

Atlantic salmon

- 1.5.1.6 The River Ehen holds a significant population of Atlantic salmon the Environment Agency has classified the population as ‘probably at risk’ based on the 2017 assessment and was predicted to remain in that status over the following five years. Recent estimates suggest that the salmon migration flow-range in the River Ehen is estimated to be between 90 ml/d to 390 ml/d with peak migration occurring around 240 ml/d. October through to the end of January is the principal time for salmon migration into the River Ehen SAC (Natural England, 2022a).
- 1.5.1.7 Figure 1.2 presents the likely migration routes for anadromous fish reaching UK rivers. These migration routes have been considered when assessing the potential for an Adverse Effect on Integrity on the SACs listed in paragraph 1.5.1.2 in section 1.5.2 and 1.5.3.

Condition assessment

- 1.5.1.8 A condition assessment was carried out for units of the River Ehen (Ennerdale Water to Keekle Confluence) SSSI which overlaps with the River Ehen SAC. For both units of the SSSI assessed, the freshwater pearl mussel was deemed to be in unfavourable declining condition and the Atlantic salmon feature was deemed to be in unfavourable no change condition (Natural England, 2022b)¹.

¹

<https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0030057&SiteName=river%20ehen&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

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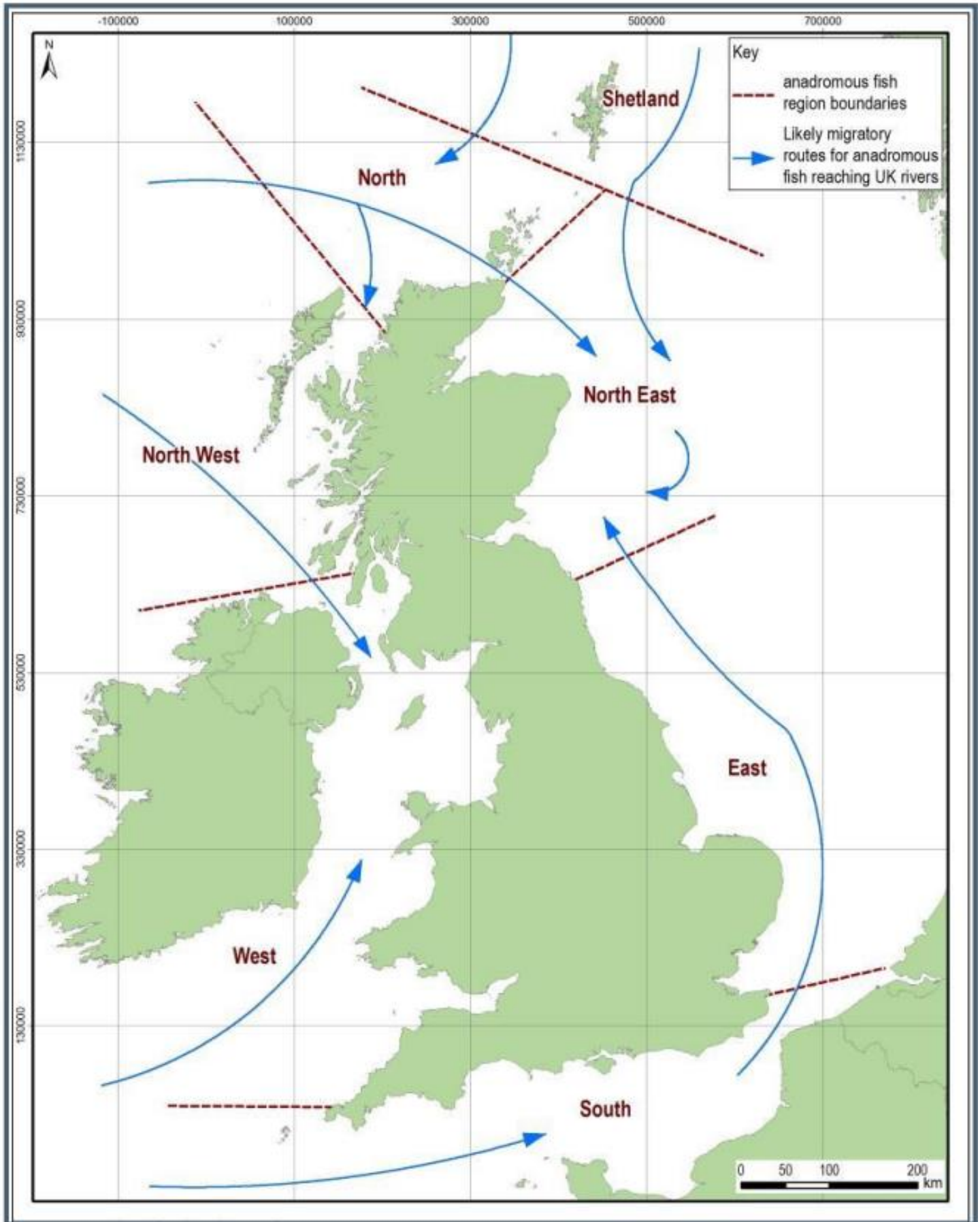


Figure 1.2: Likely migration routes for anadromous fish reaching UK rivers (ABPmer, 2014).

Conservation objectives

1.5.1.9 The conservation objectives for the River Ehen SAC (Natural England, 2019a)² are outlined below. With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'qualifying features' listed below), and subject to natural change, site integrity should be ensured by maintaining or restoring as appropriate. The site should contribute to achieving the FCS of its qualifying features, by maintaining or restoring:

- The extent and distribution of the habitats of qualifying species
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

Dee Estuary/Aber Dyfrdwy SAC

Site description

1.5.1.10 The Dee Estuary Aber Dyfrdwy SAC is located 70.1 km from the Morgan Generation Assets. River lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*, which migrate through the SAC, are Annex II species present as qualifying features, but are not a primary reason for selection of the SAC.

Feature accounts

Sea lamprey

1.5.1.11 The sea lamprey is a primitive, jawless fish resembling an eel and is the largest of the lamprey species found in the UK. It occurs in estuaries and easily accessible rivers and is an anadromous species (i.e. spawning in freshwater but completing its life cycle in the sea) (JNCC, 2022e).

1.5.1.12 Sea lamprey are present in the River Dee which forms an essential part of their migratory route. Records of sea lamprey caught at the fish trap at Chester Weir indicate that mature adults migrate upstream almost exclusively during the months of May and June (Potter and Hatton-Ellis, 2003).

River lamprey

1.5.1.13 The river lamprey is found in coastal waters, estuaries and accessible rivers. Some populations are permanent freshwater residents; however, the species is normally anadromous (i.e. spawning in freshwater but completing part of its life cycle in the sea) (JNCC, 2022e). They live on hard bottoms or attached to larger fish such as cod and herring due to their parasitic feeding behaviour, with spawning taking place in pre-excavated pits in riverbeds. Due to their preference for estuarine and nearshore coastal waters, it is unlikely that river lamprey will be found within the Morgan Generation Assets.

² <http://publications.naturalengland.org.uk/publication/4544671464292352>

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1.5.1.14 River lamprey are also present in the River Dee and must therefore use the Dee Estuary as part of their migratory route. As mentioned above lampreys are known to congregate in large estuaries of major rivers, although this feeding behaviour has not yet been documented for the Dee Estuary. However, it is known that several potential river lamprey prey species are found within the Dee Estuary including herring *Clupea harengus*, sprat *Sprattus sprattus*, flounder *Platichthys flesus* and small gadoids (Henderson, 2003). Records of river lamprey caught at the fish trap at Chester weir indicate that mature adults undertake their upstream migration at two different periods of the year, either early spring (March to April) or late summer/autumn (August to November).

Condition assessment

1.5.1.15 Table 1.4 outlines the indicative condition assessments of the relevant qualifying features of the Dee Estuary/Aber Dyfrdwy SAC, overall the condition assessment deemed that both river and sea lamprey are in unfavourable condition (NRW, 2022a). Water quality issues are likely to be contributing to the condition of the lamprey features at this SAC (NRW, 2022a)³.

Table 1.4: Condition assessment of relevant Annex II diadromous fish species of the Dee Estuary/Aber Dyfrdwy SAC.

Component of species feature assessed	Indicative assessment (favourable, unfavourable, unknown)	Level of agreement	Confidence in evidence	Component confidence level
River lamprey				
Freshwater population variables	Favourable	High	Medium	Medium
Marine habitat	Unfavourable	High	High	High
Sea lamprey				
Freshwater population variables	Unfavourable	High	High	High
Marine habitat	Unfavourable	High	High	High

Conservation objectives

1.5.1.16 The conservation objective for the river lamprey feature of the Dee Estuary SAC is to maintain the feature in a favourable condition, as defined below (Natural England and CCW, 2010)⁴:

³ <https://cdn.cyfoethnaturiol.cymru/media/684383/dee-estuary-sac-ica-2018.pdf>

⁴ https://naturalresources.wales/media/673576/Dee%20Estuary-Reg33-Volume%201-English-091209_1.pdf

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- The river lamprey feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
 - The migratory passage of both adult and juvenile river lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality
 - The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime⁵ in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000)
 - The abundance of prey species⁶ forming the river lamprey's food resource within the estuary, is maintained.

1.5.1.17 The conservation objective for the sea lamprey feature of the Dee Estuary SAC is to maintain the feature in a favourable condition, as defined below:

- The sea lamprey feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
 - The migratory passage of both adult and juvenile sea lampreys through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality
 - The five year mean count of sea lampreys recorded by the Chester Weir fish trap is no less than 18 under the monitoring regime⁵ in use prior to notification. (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000)
 - The abundance of prey species¹⁰ forming the sea lamprey's food resource within the estuary, is maintained.

1.5.1.18 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.5.2; conservation objectives relating to the qualifying habitats of the SAC will not be considered, on the basis no pathways to effect exist.

River Derwent and Bassenthwaite Lake SAC

Site description

1.5.1.19 The River Derwent and Bassenthwaite SAC is located 71.2 km from the Morgan Generation Assets. The SAC consists of the River Derwent, a large oligotrophic river system with high water quality and a natural channel (Natural England, 2019c). The Derwent flows through two lakes Derwentwater and Bassenthwaite, with presence of aquatic flora is typical of oligotrophic/mesotrophic lake. Designated fish species present within the SAC include Atlantic salmon, sea lamprey, river lamprey and brook

⁵ Monitoring regime at Chester Weir fish trap: Over the five years for which data are available prior to notification (1993, 1997- 2000) Chester Fish trap operated for a mean of 394 hours per month, throughout the year, each year (I. Davidson, pers. comm.). Any change in the operation of the fish trap especially changes in the total hours the trap is active for per month or per year may require the count in the objective to be revised.

⁶ In the estuaries of major rivers river lamprey feed on a variety of fish, particularly herring *Clupea harengus*, sprat *Sprattus sprattus* and flounder *Platichthys flesus* (Maitland, 2003). Sprats are present in the Dee Estuary throughout the year and it is likely that they are one of the most important prey species for river lamprey during the winter months when the adults move inshore (Henderson, 2003). From November to March herring are also common. During the summer months other fish such as flounder and small gadoids such as whiting *Merlangius merlangus* and pouting *Trisopterus luscus* are potential prey (Henderson, 2003). They are also known to feed off sea trout *Salmo trutta* (Bird, 2008).

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lamprey *Lampetra planeri* which are all a primary reason for the selection of the SAC. The site encompasses various important salmon spawning areas as well as extensive sea and river lamprey nursery grounds (Natural England, 2019c).

Feature accounts

Atlantic salmon

- 1.5.1.20 The Derwent represents Atlantic salmon populations in northwest England and is a particularly good example of a large oligotrophic river flowing over base-poor geology, providing a contrast to the more mesotrophic River Eden (Natural England, 2019c). Low intensity land-use in the catchment means there is good water quality throughout much of the system. This water quality, coupled with the presence of extensive gravel shoals, makes it a particularly suitable river for breeding and enables it to support a large population (JNCC, 2022b).

Sea lamprey

- 1.5.1.21 The Derwent represents sea lamprey in a high-quality oligotrophic river in north England. The presence of gravels and silts in the middle to lower reaches of this river means that it supports a large population of sea lamprey (Natural England, 2019c; JNCC, 2022b).

River lamprey

- 1.5.1.22 The Derwent represents river lamprey in an oligotrophic river in north England. High numbers of this species are known to occur and this river has features that provide the necessary habitats for both spawning and nursery areas (gravel shoals, good water quality and areas of marginal silt) (Natural England, 2019c; JNCC, 2022b).

Condition assessment

- 1.5.1.23 Condition assessments are not available for the River Derwent and Bassenthwaite SAC.

Conservation objectives

- 1.5.1.24 The conservation objectives for the Derwent and Bassenthwaite Lake SAC (Natural England, 2019c)⁷ are outlined below. With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'qualifying features' listed below), and subject to natural change, site integrity should be ensured by maintaining or restoring as appropriate. The site should contribute to achieving the FCS of its qualifying features, by maintaining or restoring:

⁷ <http://publications.naturalengland.org.uk/publication/6086221126172672>

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- The extent and distribution of the habitats of qualifying species
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.5.1.25 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.5.2, conservation objectives relating to the qualifying habitats of the SAC will not be considered on the basis of the findings of the HRA Stage 1 Screening.

River Kent SAC

Site description

1.5.1.26 The River Kent SAC is located 80.9 km from the Morgan Generation Assets. The River Kent's main tributaries have their catchments in the southeast Lake District fells which provide natural mineral enrichment in the form the calcium necessary for growth (Natural England, 2005a). Due to high water quality, heavy rainfall on the catchment fells and a short distance from the headwaters to the mouth of the river, a high degree of flushing occurs throughout the river which maintains the river bed free of silt and algal growth. The high water quality, fast flow regime, cool temperatures and suitable areas of habitat, also provide sufficient habitat for freshwater pearl mussels found primarily in one of the upper tributaries and also present as a qualifying feature of the SAC, but not a primary reason for site selection (Natural England, 2005b).

Feature accounts

Freshwater pearl mussel

1.5.1.27 The freshwater pearl mussel requires clean, fast flowing, highly oxygenated rivers and burrows into sand/gravel substrates, often between boulders and pebbles (Geist and Auerswald, 2007). The freshwater pearl mussel is currently found in only one tributary of the Kent, Dubbs Beck (unit 102) which is situated between two reservoirs (Natural England, 2005b). The mussel requires a salmonid fish host for its larval (glochidial) stage; it is thought that the host species within the River Kent SAC is freshwater specimens of sea trout, although in line with a precautionary approach for the basis of this assessment Atlantic salmon is also considered to be a host species. A pollution incident and consequent recruitment failure (lack of juvenile mussels) have resulted in declines in the population within the river in the last decade (Natural England, 2005b).

Condition assessment

1.5.1.28 A condition assessment was carried out for a unit of the River Kent and Tributaries SSSI which overlaps with the River Kent SAC. Within this unit the freshwater pearl mussel feature was deemed to be in unfavourable condition (Natural England, 2022c)⁸.

⁸ <https://designatedsites.naturalengland.org.uk/SiteSACFeaturesMatrix.aspx?SiteCode=UK0030256&SiteName=River%20Kent%20SAC>

Conservation objectives

1.5.1.29 The conservation objectives for the River Kent SAC (Natural England, 2018e)⁹ are outlined below. With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'qualifying features' listed below), and subject to natural change, site integrity should be ensured by maintaining or restoring as appropriate. The site should contribute to achieving the FCS of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.5.1.30 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.5.2, conservation objectives relating to the qualifying habitats of the SAC will not be considered on the basis of the findings of the HRA Stage 1 Screening (Document Reference E1.4).

Solway Firth SAC

Site description

1.5.1.31 The Solway Firth SAC is located 84.7 km from the Morgan Generation Assets. The Solway is a large, complex estuary with moderately strong tidal streams and wave action (Natural England, 2005a). The sediment habitats present throughout the estuary consist mainly of dynamic sandflats and subtidal reefs. There are unusually large areas of upper marsh which is predominantly characterised by saltmarsh rush *Juncus gerardii* community with smaller areas of the saltmarsh-grass/*fescue Puccinellia/Festuca* communities (Natural England, 2005). The sublittoral sediment communities are typically sparse in the inner estuary, due to high levels of sediment mobility coupled with low and variable salinity whilst intertidal sediments are characterised by flats of fine sands, rather than muds. The estuary also provides a migratory passage for sea lamprey and river lamprey to and from their spawning and nursery grounds, which are present as qualifying features and primary reasons for the selection of the SAC (Natural England, 2005a).

Feature accounts

Sea lamprey

1.5.1.32 The Solway Firth provides migratory passage for sea lamprey to and from spawning and nursery grounds in a number of rivers, including the Eden which is also designated as a SAC for the species (JNCC, 2022c).

⁹ <http://publications.naturalengland.org.uk/publication/5256393649029120>

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River lamprey

- 1.5.1.33 The Solway Firth provides migratory passage for river lamprey to and from spawning and nursery grounds in a number of rivers, including the Eden which is also designated as a SAC for the species (JNCC, 2022c).

Condition assessment

- 1.5.1.34 The condition of the sea lamprey and river lamprey features of the Solway Firth SAC have not been assessed (NatureScot, 2022)¹⁰.

Conservation objectives

- 1.5.1.35 The conservation objectives for the Solway Firth SAC (Natural England, 2018e)¹¹ are outlined below. With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'qualifying features' listed below), and subject to natural change, site integrity should be ensured by maintaining or restoring as appropriate. The site should contribute to achieving the FCS of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

- 1.5.1.36 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.5.2, conservation objectives relating to the qualifying habitats of the SAC will not be considered.

River Bladnoch SAC

Site description

- 1.5.1.37 The River Bladnoch SAC is located 89.8 km from the Morgan Generation Assets. The River Bladnoch flows from Mayberry Loch in South Ayrshire for seven miles to Wigtown Bay. The River Bladnoch is designated for Atlantic salmon (present as a primary reason for the selection of the site) and the site supports a high-quality salmon population and a spring run of salmon (JNCC, 2022d). The river's ecological and water quality characteristics are influenced by a moderate-sized catchment with diverse upland and lowland areas (JNCC, 2022d).

¹⁰ <https://sitelink.nature.scot/site/8377>

¹¹ <http://publications.naturalengland.org.uk/publication/6556237919420416>

Feature accounts

Atlantic salmon

- 1.5.1.38 The River Bladnoch is located in south west Scotland and supports a high-quality salmon population and a spring run of salmon which is considered unusual for rivers in this region. There are issues associated with acidification upstream however these are subject to national and local initiatives which are both reducing and ameliorating the worst effects of this pollution source (JNCC, 2022e).

Condition assessment

- 1.5.1.39 The condition of the Atlantic salmon feature was assessed as part of the Nature Scot's site condition monitoring programme. The feature was assessed as unfavourable recovering in September 2011 (NatureScot, 2020)¹².

Conservation objectives

- 1.5.1.40 The conservation objectives for the River Bladnoch SAC (NatureScot, 2020)¹³ are outlined below:
- 1. To ensure that the qualifying feature of the River Bladnoch SAC is in favourable condition and makes an appropriate contribution to achieving FCS
 - 2. To ensure that the integrity of the River Bladnoch SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature
 - 2a. Restore the population of the species, including range of genetic types, as a viable component of the site
 - 2b. Restore the distribution of the species throughout the site
 - 2c. Restore the habitats supporting the species within the site and availability of food.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

Site description

- 1.5.1.41 The River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, which is 92.4 km from the Morgan Generation Assets, extends from Llyn Tegid encompassing the Bala lake and its banks and outfalls into the River Dee. The site extends downstream to where it joins the Dee Estuary Site of Special Scientific Interest (SSSI). Several Dee tributaries are also included within the site, specifically the Ceiriog, Meloch, Tryweryn, and Mynach. Atlantic salmon are a primary reason for the selection of the River Dee and Bala Lake SAC, with the Mynach, Meloch and Ceiriog tributaries being the most prevalent salmon spawning tributaries in the Dee catchment. Other diadromous fish species present as qualifying features of the site are river lamprey and sea lamprey present as qualifying features but not a primary reason for site selection.

¹² <https://sitelink.nature.scot/site/8355>

¹³ https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwid37n-qqv8AhU7_bslHcEgDcQQFnoECAwQAw&url=https%3A%2F%2Fapps.snh.gov.uk%2Fsitelink-api%2Fv1%2Fsites%2F8355%2Fdocuments%2F66%23%3A~%3Atext%3DThe%2520aim%2520at%2520this%2520SAC%2Cto%2520its%2520wider%2520conservation%2520status.&usq=AOvVaw20NFyWfXG9_8pC4bhyzJCM&cshid=1672746684001234

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Feature accounts

Atlantic salmon

1.5.1.42 Atlantic salmon are anadromous (i.e. spawns in freshwater but completes its life cycle in the sea). Atlantic salmon spend two to three years in freshwater, with downstream migration (to open sea) occurring between April and May. Atlantic salmon remain at sea for one to three years. Upstream migration into freshwater occurs year-round, with a peak in late summer/early autumn (NRW, 2022b).

1.5.1.43 No site specific information is available for this feature.

Sea lamprey

1.5.1.44 No site specific information is available for this feature. An overview of the ecology of the species is provided in paragraph 1.5.1.11.

River lamprey

1.5.1.45 No site specific information is available for this feature. An overview of the ecology of the species is provided in paragraph 1.5.1.13 and 1.5.1.14.

Condition assessment

1.5.1.46 Table 1.5 outlines the indicative condition assessment for the Atlantic salmon qualifying feature of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. There isn't sufficient information to assess the population size and dynamics of the sea lamprey and river lamprey feature. However overall, the condition assessment deemed that Atlantic salmon, river and sea lamprey features are all in unfavourable condition (NRW, 2022b)¹⁴.

Table 1.5: Condition assessment of relevant Annex II diadromous fish species of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC.

Attribute	Pass	Fail
Atlantic salmon		
Juvenile population densities	✓	
Adult run		x
Overall assessment		x

Conservation objectives

1.5.1.47 The conservation objectives for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (NRW, 2022b) are outlined below.

¹⁴ https://afonyddcymru.org/wp-content/uploads/2022/11/river_dee_bala_lake_32_plan.pdf

Atlantic salmon

- The vision for this feature is for it to be in a FCS, where all of the following conditions are satisfied:
 - The parameters defined in the vision for the watercourse as defined above must be met
 - The SAC feature populations will be stable or increasing over the long term
 - The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future
 - There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis
 - All known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control).

Sea lamprey and river lamprey

- The vision for this feature is for it to be in a FCS, where all of the following conditions are satisfied:
 - The parameters defined in the vision for the watercourse as defined above must be met
 - The SAC feature populations will be stable or increasing over the long term
 - The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future
 - There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis
 - All factors affecting the achievement of these conditions are under control.

1.5.1.48 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.5.2, conservation objectives relating to the qualifying habitats of the SAC will not be considered.

Afon Gwyrfaï a Llyn Cwellyn SAC

Site description

1.5.1.49 The Afon Gwyrfaï a Llyn Cwellyn SAC is located 117.9 km from the Morgan Generation Assets. This SAC encompasses the Afon Gwyrfaï and Llyn Cwellyn. The Gwyrfaï flows out of Llyn y Gader near Rhyd Ddu and passes through Llyn Cwellyn before reaching the sea at, Caernarfon Bay. The lake Llyn Cwellyn is a deep oligotrophic lake, recognised for its conservation importance. The Gwyrfaï river system is recognised for outstanding ecological and water quality and is designated for an extensive Atlantic salmon population (the primary reason for selection of the site), one of the best supporting rivers in the United Kingdom (Countryside Council for Wales, 2008).

Feature accounts

Atlantic salmon

1.5.1.50 The Afon Gwyrfaï in northwest Wales is representative of the small montane rivers in the region. The river contains a largely unexploited salmon population with a

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characteristically late run (JNCC, 2022c). Electrofishing data from the Environment Agency indicates the presence of healthy juvenile populations downstream of Llyn Cwellyn within the SAC (JNCC, 2022c).

Condition assessment

- 1.5.1.51 The condition assessment for the Atlantic salmon feature of the Afon Gwyrfaï a Llyn Cwellyn SAC deemed the feature to be unfavourable: unclassified (Countryside Council for Wales, 2008). The current unfavourable status results from an assessment of feature distribution and abundance within the SAC, specifically salmon catch and juvenile surveys (Countryside Council for Wales, 2008)¹⁵.

Conservation objectives

- 1.5.1.52 The conservation objectives for the Afon Gwyrfaï a Llyn Cwellyn SAC (Countryside Council for Wales, 2012)¹⁶ are outlined below:

- The conservation objective for the water course as outlined in CCW (2012) must be met
- The population of the feature in the SAC is stable or increasing over the long term
- The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future
- The Gwyrfaï will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.

River Eden SAC

Site description

- 1.5.1.53 The River Eden SAC is located 125.6 km from the Morgan Generation Assets. Atlantic salmon, bullhead *Cottus gobio*, sea lamprey, river lamprey and brook lamprey *Lampetra planeri* are all present as qualifying features that are the primary reason for selection of the site. The Eden maintains a large population of salmon owing to the extensive suitable habitat available including areas of gravel and finer silt owing to the highly erodible nature of the rock within the river, which provide conditions for spawning and nursery areas (Natural England, 2019a). The River Eden also supports brook and river lampreys and a large population of sea lamprey in the middle to lower regions of the river. The extensive areas of gravel outlined above, and generally good quality water, provides habitat for bullheads and the tributaries, specifically those flowing over limestone, also hold high numbers of bullhead (Natural England, 2019b).

Feature accounts

Atlantic salmon

- 1.5.1.54 The Eden represents one of the largest populations of Atlantic salmon in north England. The varied, base-rich geology and large range in altitude results in the

¹⁵ https://naturalresources.wales/media/670697/Afon%20Gwyrfaï%20a%20Llyn%20Cwellyn%20Management%20%20Plan%20_English_.pd

¹⁶ https://afonyddcymru.org/wp-content/uploads/2022/11/afon-gwyrfaï-a-llyn-cwellyn-management-plan-_english_.pdf

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development of distinct habitat types, supporting diverse plant and invertebrate communities. The high ecological value of the river system and the fact that the salmon are able to use the majority of the catchment mean that the Eden supports a large population of salmon (JNCC, 2022b).

Sea lamprey

- 1.5.1.55 The highly erodible nature of the rock within the Eden results in extensive areas of gravel and finer silts being deposited throughout the system, which provide suitable habitats for spawning and nursery areas. A large and healthy population of sea lamprey is therefore supported in the middle to lower regions of the river (JNCC, 2022b).

River lamprey

- 1.5.1.56 The highly erodible nature of the rock within the Eden results in extensive areas of gravel and finer silts being deposited throughout the system, which provide suitable habitats for spawning and nursery areas. The high quality of these habitats and their accessibility results in the river hosting a large, healthy population of river lamprey (JNCC, 2022b).

Condition assessment

- 1.5.1.57 A condition assessment was carried out for units of the River Eden and Tributaries SSSI which overlaps with the River Eden SAC. For the assessment of this SAC an average of the condition across all units has been taken for each qualifying species, therefore on this basis sea lamprey and river lamprey are deemed to be unfavourable recovering and Atlantic salmon is deemed to be in favourable condition (Natural England, 2022c)¹⁷.

Conservation objectives

- 1.5.1.58 The conservation objectives for the River Eden SAC (Natural England, 2019b)¹⁸ are outlined below. With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'qualifying features' listed below), and subject to natural change, site integrity should be ensured by maintaining or restoring as appropriate. The site should contribute to achieving the FCS of its qualifying features, by maintaining or restoring:

¹⁷

<https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0012643&SiteName=river%20eden&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

¹⁸ <http://publications.naturalengland.org.uk/publication/5935614042046464b>

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- The extent and distribution of qualifying natural habitats and the habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.5.1.59 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.5.2, conservation objectives relating to the qualifying habitats of the SAC will not be considered on the basis of the findings of the HRA Stage 1 Screening.

1.5.2 Assessment of adverse effects alone

1.5.2.1 The following assessments of the effects of the Morgan Generation Assets alone on Annex II diadromous fish have been informed by the detailed project-specific underwater sound modelling presented in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1) and the technical assessments presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). The assessments have also drawn upon the sensitivity assessments of the relevant fish species detailed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions on the potential for an adverse effect on the integrity of European site(s) have been identified in light of the best available scientific knowledge and all reasonable scientific doubt can be ruled out.

Underwater sound impacting fish and shellfish receptors

1.5.2.2 Some activities associated with the construction of the Morgan Generation Assets will generate underwater sound which has the potential to result in mortality, injury and/or disturbance to diadromous fish. Furthermore, elevated underwater sound has the potential to disrupt the migration of fish to their preferred spawning habitats (see Volume 2, Chapter 3 Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). The greatest potential impacts from underwater sound emissions are predicted to result from piling activities (for the installation of wind turbines and Offshore Substation Platform (OSP) foundations) and UXO clearance including detonation within the Morgan Array Area.

1.5.2.3 Underwater sound modelling for all relevant activities has been undertaken for the Morgan Generation Assets and full details are presented in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1). Most other sound sources including cable installation, foundation drilling and geophysical site investigation activities are non-percussive and will result in much lower sound levels and therefore much smaller injury ranges (in most cases no injury is predicted) than those predicted for piling and UXO operations. Unlike the sonar-like survey sources, UHRS may be used for geophysical site investigation activities and is likely to utilise a sparker, which produces an impulsive, broadband source signal. A full description of the source sound levels for sound sources is

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provided in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1).

1.5.2.4 No piling or UXO activities will be carried out during the decommissioning phase and therefore potential impacts related to underwater sound during this phase are predicted to be lower than for the construction phase, and thus impacts on Annex II diadromous fish features of the relevant European sites during the decommissioning phase are predicted to be no greater than those associated with the construction phase. Therefore, the assessment presented below groups both the construction and decommissioning phases and does not specifically assess impacts associated with the decommissioning phase.

1.5.2.5 The assessment of LSE in the HRA Stage 1 Screening Report (Document Reference E1.4) identified that during construction and decommissioning, LSE could not be ruled out for the potential impact of underwater sound impacting fish and shellfish receptors. This relates to the designated site and relevant Annex II diadromous fish features listed in Table 1.6.

Table 1.6: European sites and relevant Annex II diadromous fish features from which the potential for an LSE could not be ruled out in relation to underwater sound.

SAC	Annex II diadromous fish features
River Ehen SAC	<ul style="list-style-type: none"> • Atlantic salmon • Freshwater pearl mussel
Dee Estuary/Aber Dyfrdwy SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey
River Derwent and Bassenthwaite Lake SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon
River Kent SAC	<ul style="list-style-type: none"> • Freshwater pearl mussel
Solway Firth SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey
River Bladnoch SAC	<ul style="list-style-type: none"> • Atlantic salmon
River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon
Afon Gwyrfai a Llyn Cwellyn SAC	<ul style="list-style-type: none"> • Atlantic salmon
River Eden SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon

1.5.2.6 The following sections explain how this potential impact on Annex II diadromous fish features of the European sites listed above have been quantified and assessed.

1.5.2.7 For the purposes of the assessment, sea lamprey and river lamprey have been assessed together due to their similar sensitivity to underwater sound and the fact that their conservation objectives are the same for both species at all European sites assessed and therefore effects and associated conclusions are considered to be alike.

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1.5.2.8 The MDS considered for the assessment of potential impacts from underwater sound on Annex II diadromous fish features is presented in Table 1.7.

Table 1.7: Maximum design scenario considered for the assessment of potential impacts on diadromous fish from underwater sound.

Phase	MDS	Justification
Construction phase	<p>Piling</p> <ul style="list-style-type: none"> • Pin piles x 454 <ul style="list-style-type: none"> – Wind turbines foundations - jackets: installation up to 64 x four-legged jacket foundations with one pin pile per leg (a total of up to 256 pin piles), and each pin pile with a diameter of 3.8 m installed by impact piling – Wind turbines foundations – gravity base foundations: ground strengthening at up to 10 x gravity base foundations with up to 15 pin piles per foundation (a total of up to 150 pin piles), and each pin pile with a diameter of 4 m installed by impact piling – OSP foundations: installation of four OSPs with four-legged jacket foundations, with three pin piles per leg (a total of 48 pin piles) and each pin pile with a diameter of 3.5 m installed by impact piling – Maximum hammer energy of up to 4,400 kJ – Up to two vessels piling concurrently (minimum distance 1.4 km, maximum distance 15 km, between piling vessels) – Wind turbine foundations - jackets: maximum duration of up to 4.5 hours piling per pin pile, total duration of piling per wind turbine foundation =18 hours of piling per day (with a cumulative total of up to 1,152 hours) – Wind turbine foundations – gravity base foundations: average duration of up to four hours piling per pin pile, total average duration of piling per gravity base foundation = 60 hours (with a cumulative total of up to 600 hours for 10 x foundations) – OSP foundations: maximum duration of up to 4.5 hours piling per pin pile with a cumulative total of up to 216 hours; installation of OSPs over 12 days (=18 hours piling per day) – Consecutive piling over a maximum of 24 hours. – Single piling of 94 days for wind turbine foundations (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) or 57 days for two vessels (maximum spatial). <p>Total piling phase (foundation installation) of up to two years within a four-year construction programme.</p> <p><u>Geophysical site investigation</u></p> <ul style="list-style-type: none"> • Geophysical site investigation activities will include the following activities: <ul style="list-style-type: none"> – Multibeam Echo-sounder (MBES) – Sidescan Sonar (SSS) – Single Beam Echosounder (SBES) – Sub-Bottom Profilers (SBP) – Ultra High Resolution Seismic (UHRS, e.g. sparker). 	<p>For piling, the largest hammer energy and maximum spacing between concurrent piling events would lead to the largest spatial extent of ensonification at any one time.</p> <p>Drilling would also be undertaken during foundation installation which would also produce potential sound impacts, but piling still represents the maximum design scenario for this impact.</p> <p>Minimum spacing between concurrent piling represents the highest risk of injury to fish and shellfish as sound from adjacent foundations could combine to produce a greater radius of effect compared to a single piling event.</p> <p>For both wind turbine piles and gravity base foundations, the maximum temporal scenario was assessed on the greatest number of days on which piling could occur based on the number of piles that could be installed within a 24-hour period.</p> <p>Consecutive piling is assumed over a maximum period of 24 hours.</p> <p>For geophysical site investigation the range of geophysical survey activities likely to be undertaken is considered using equipment typically employed for these types of surveys.</p>

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Phase	MDS	Justification
	<p>For further detail regarding geophysical sound sources and levels, see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1).</p> <p><u>UXO</u></p> <ul style="list-style-type: none"> • Clearance of up to 13 UXOs within the Morgan Array Area • A range of UXO sizes assessed from 25 kg up to 907 kg with 130 kg the most likely maximum • For high order detonation donor charges of 1.2 kg (most common) and 3.5 kg (single barracuda blast charge) • Up to 0.5 kg Net Explosive Quantity (NEQ) clearance shot for neutralisation of residual explosive material at each location • Clearance during daylight hours only. <p>MDS is for high order clearance but assessment also considered:</p> <ul style="list-style-type: none"> • Low order clearance charge size of 0.08kg • Low yield clearance configurations of 0.75kg charges (up to 4 x 0.75kg) 	<p>For UXO clearance the maximum number and maximum size of UXOs encountered in the Morgan Array Area is considered. Due to uncertainties in size of UXOs the assessment presents a range, highlighting the most likely size (common) to be encountered.</p> <p>Most likely and maximum donor charges assessed for high order detonation.</p> <p>Assumption of a clearance shot of up to 0.5kg at all locations although noting that this may not always be required.</p> <p>For low order/low yield clearance, charges are based on the maximum required to initiate a clearance event.</p>

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Measures adopted as part of Morgan Generation Assets

1.5.2.9 Measures adopted as part of the Morgan Generation Assets which are of relevance to the assessment of potential impacts on Annex II diadromous fish features from underwater sound during construction and decommissioning are presented in Table 1.8.

Table 1.8: Measures adopted as part of the project which are relevant to the assessment of European sites designated for Annex II diadromous fish features from elevated underwater sound.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development of, and adherence to, a Marine Mammal Mitigation Protocol MMMP, based on the Outline MMMP (Document Reference J17) that requires implementation of an initiation stage of piling soft start and ramp-up.	This measure will minimise the likelihood of injury from elevated underwater sound to some fish species in the immediate vicinity of piling operations, allowing reactive individuals to move away from the area before sound levels reach a level at which injury may occur.	MMMP secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).
Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17)) which sets a maximum separation limit of 15 km for concurrent piling.	Commitments made around maximum separation during concurrent piling will minimise the likelihood of disturbance to fish species in the immediate vicinity of piling operations, by limiting the ensonified area during concurrent piling. Where piling occurs concurrently a maximum separation distance of 15 km is used to limit the ensonified area as there is greater overlap when closer together.	MMMP secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).
Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17)) which sets a minimum separation limit of 1.4 km for concurrent piling.	Commitments made around minimum separation during concurrent piling will minimise the likelihood of injury to fish species in the immediate vicinity of piling operations, by limiting the spatial overlap of areas of ensonification during concurrent piling. Where piling occurs concurrently, a minimum separation distance of 1.4 km is used to minimise the potential for effects due to direct overlap of concurrent piling.	MMMP secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).
Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17)) which sets the limit on maximum hammer energy used during concurrent piling at 3,000 kJ and during the single event piling at 4,400 kJ.	Commitments made around concurrent piling will minimise the likelihood of injury to fish species in the immediate vicinity of piling operations, by reducing the ensonified area during concurrent piling.	MMMP secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).
Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17) that requires implementation of a mitigation hierarchy with regard to UXO clearance that follows:	Low order techniques generate less underwater sound than high order techniques and therefore present a lower risk to sound-sensitive receptors such as marine mammals and fish during UXO clearance. Noting the position statement from statutory authorities on UXO	MMMP secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).

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Measure	Justification	How the measure will be secured
<ul style="list-style-type: none"> • Avoid UXO • Clear UXO with low order techniques • Clear UXO with high order techniques. <p>Low order techniques or avoidance of confirmed UXO are not always possible and are dependent upon the individual situations surrounding each UXO.</p>	<p>clearance (UK Government, 2022), the option to clear UXOs with low order techniques has been considered as a potential primary mitigation measure as part of this assessment.</p> <p>Note, however, that low order techniques are not always possible and are dependent upon the individual situations surrounding each UXO. Given that it is possible that high order detonation may be used, the Outline MMMP includes mitigation to reduce the likelihood of injury from UXO clearance. Please see below.</p> <p>The Outline Underwater Sound Management Strategy (Document Reference J16) includes potential further mitigation options, should the measures in the MMMP (Document Reference J17) not reduce impacts, such that there will be no residual significant effect from the project.</p>	

Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice

<p>Development of, and adherence to, a MMMP, which will be developed in accordance with the Outline MMMP (Document Reference J17) included as part of the application.</p> <p>The Outline MMMP (Document Reference J17) present appropriate mitigation for activities that could potentially lead to injurious effects on marine mammals including: piling, UXO clearance and some types of geophysical activities.</p> <p>Piling: for the purpose of developing the MMMP (Document Reference J17) as an annex of the Underwater Sound Management Strategy (UWSMS) (Document Reference J13), a mitigation zone will be defined based on the maximum predicted injury range from the dual metric sound modelling for the maximum spatial scenario (pin piles) and across all marine mammal species. The Outline MMMP (Document Reference J17) sets out the measures to apply in advance of and during piling activity including the use of:</p> <ul style="list-style-type: none"> • Marine Mammal Observers (MMOs) • Passive Acoustic Monitoring (PAM) • Acoustic Deterrent Devices (ADD) <p>Therefore following the latest JNCC guidance (JNCC, 2010a).</p>	<p>The implementation of an approved MMMP will mitigate for the risk of physical or permanent auditory injury to marine mammals within a pre-defined 'mitigation zone' for each activity. The mitigation zone is determined considering the largest injury zone across all species for each relevant activity. The use of an approved MMMP will also minimise the potential for collision risk, or potential injury to, marine mammals and other marine megafauna (e.g. basking shark and sea turtles). The MMMP will include visual and acoustic monitoring as a minimum over the defined mitigation zones to ensure animals are clear before the activity commences. Additional measures to deter animals from injury risk zones may be applied in some instances (e.g. ADDs or soft start charges).</p> <p>The MMMP will be developed on the basis of the most recent published statutory guidance and in consultation with key stakeholders.</p> <p>Benefits derived from the MMMP are also expected to apply to some fish species.</p>	<p>MMMP secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).</p>
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Measure	Justification	How the measure will be secured
<p>UXO clearance: Measures including visual and acoustic monitoring, the use of an ADD and soft start charges will be applied to deter animals from the mitigation zone as defined by sound modelling for the largest possible UXO following the latest JNCC guidance (JNCC, 2010b).</p> <p>Geophysical surveys: Mitigation for injury during high resolution geophysical surveys using a sub-bottom profiler from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with JNCC guidance (JNCC, 2017). Soft start is not possible for some SBP equipment but will be applied for other high resolution surveys where possible. Note also, some multi-beam surveys in shallow waters (<200 m) are not subject to the development of and adherence requirements of mitigation.</p>		
<p>Development of, and adherence to, an Outline UWSMS (Document Reference J13) that includes consideration of Noise Abatement Systems (NAS) as part of mitigation options. A commitment to considering NAS as part of mitigation options in the UWSMS, which will be developed in accordance with the Outline UWSMS (Document Reference J13), will be made as part of a stepped strategy post consent and following the mitigation hierarchy – avoid, reduce, mitigate.</p>	<p>To mitigate for the likelihood of physical or permanent auditory injury or behavioural impacts to fish and shellfish species.</p>	<p>UWSMS secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).</p>

Construction and decommissioning phases

Information to support assessment

Hearing sensitivity of Annex II diadromous fish features

1.5.2.10 The Sound Exposure Guidelines for Fishes and Sea Turtles (Popper *et al.*, 2014) are considered to be the most relevant and best available guidelines for impacts of underwater sound on fish species (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1)). The Popper *et al.* (2014) guidelines broadly group fish into the following categories according to their hearing sensitivity and in particular, the presence or absence of a swim bladder and on the potential for that swim bladder to improve the hearing sensitivity and range of hearing:

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- Group 1: Fishes lacking swim bladders (e.g. elasmobranchs and flatfish, lamprey). These species are only sensitive to particle motion, not sound pressure and show sensitivity to only a narrow band of frequencies
- Group 2: Fishes with a swim bladder but the swim bladder does not play a role in hearing (e.g. salmonids and some Scombridae). These species are considered to be more sensitive to particle motion than sound pressure and show sensitivity to only a narrow band of frequencies
- Group 3: Fishes with swim bladders that are close, but not connected, to the ear (e.g. gadoids and eels). These fishes are sensitive to both particle motion and sound pressure and show a more extended frequency range than Groups 1 and 2, extending to about 500 Hz
- Group 4: Fishes that have special structures mechanically linking the swim bladder to the ear (e.g. clupeids such as herring, sprat and shad). These fishes are sensitive primarily to sound pressure, although they also detect particle motion. These species have a wider frequency range, extending to several kHz and generally show higher sensitivity to sound pressure than fishes in Groups 1, 2 and 3.

1.5.2.11 Sea lamprey are considered to be a group 1 fish in terms of hearing sensitivity (Popper *et al.*, 2014) and therefore have relatively low sensitivity to underwater sound. River lamprey is, like sea lamprey, classified as a group 1 fish for the purposes of hearing sensitivity and as such the assessment for sea lamprey presented above also applies to river lamprey. Atlantic salmon are a group 2 fish in terms of hearing sensitivity (Popper *et al.*, 2014) and therefore also have relatively low sensitivity to underwater sound.

Underwater sound modelling for the Morgan Generation Assets

1.5.2.12 To understand the magnitude of sound emissions from piling and UXO clearance during construction activity, underwater sound modelling has been undertaken. Full details of the modelling undertaken are presented in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1). A summary of the underwater sound modelling has been provided below in paragraphs 1.5.2.14 to 1.5.2.16 and additional detail is also included in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) including full details of sound exposure criteria used to inform the assessment, in line with Popper *et al.* (2014).

1.5.2.13 Piling activities were modelled for pin piles/jacket foundations at three locations within the Morgan Array Area taking into account the varying bathymetry and sediment type across the model areas (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1)). Underwater sound modelling included the use of 'soft start' mitigation, due to implementation of this measure being required during piling to mitigate for marine mammals, thereby modelling the most realistic scenario.

1.5.2.14 Modelling was undertaken for both single piling and concurrent piling (i.e. piling at more than one location simultaneously). Concurrent piling modelling demonstrated that sound level values in terms of a dB metric are not mathematically additive, with a typical increase of just approximately 3 dB when adding together two equal sound levels (e.g. 10 dB + 10 dB = approximately 13 dB, not 20 dB).

1.5.2.15 For peak pressure sound levels when piling energy is at its maximum (i.e. 4,400 kJ), mortality and recoverable injury to fish may occur within a maximum distance of 394

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m, based on the sound threshold value of 207 SPL_{pk} dB re 1 µPa metric of the piling activity (smaller ranges were reported for group 1 fish species (a maximum of 215 m), and the highest range was applicable to Groups 2 to 4, fish eggs and larvae; see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). It should be noted that these ranges are the maximum ranges for the maximum hammer energy, and it is unlikely that injury will occur in this range due to the implementation of soft starts during piling operations, which will allow some fish to move away from the areas of highest sound levels, before they reach a level that would cause an injury.

1.5.2.16 For cumulative Sound Exposure Level (SEL_{cum}), injury ranges were calculated for piling activities wherein fish are treated as moving and static receptors. These ranges indicate that, with the implementation of soft start initiation, when fish are modelled as moving receptors, the mortality injury ranges are considerably smaller than those predicted for the peak Sound Pressure Level (SPL_{pk}) metric, and the mortality thresholds were exceeded only for fish eggs and larvae (which are considered static receptors), within a range of up to 1.87 km from the source. The recoverable injury ranges were much lower, with thresholds not exceeded for group 1 fish (including lamprey), and group 2 fish (including salmonids) had a maximum range of 254 m. When fish were modelled as static receptors, mortality and recoverable injury ranges were significantly higher than for when fish are modelled as moving receptors, with a maximum mortality range of up to 1.87 km for group 2 fish, fish eggs/larvae and a recoverable injury range of up to 4.52 km for group 2 fish.

1.5.2.17 The injury ranges presented indicate that injury may occur out to ranges of hundreds of metres (< 400 m) when applying the SPL_{pk} metric and thousands of metres when applying the SEL_{cum} metric, depending on the species grouping and whether the receptors are static or moving. However, in reality, the risk of fish injury overall will be considerably lower due to the hammer energies being lower than the absolute maximum modelled, as demonstrated by the lower injury ranges associated with first strikes as part of the soft start procedure (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) for more information). Some fish species are expected to move away from the area affected when exposed to high levels of sound and the soft start procedure, meaning that it is likely that reactive fish will have sufficient time to vacate the areas where injury may occur prior to sound levels reaching a level causing mortality. Based on the first hammer strike the maximum mortality and recoverable injury range (when applying the SPL_{pk} metric) is predicted to be just 79 m from the source for group 2 fish. If the fish were to remain in the area and not have any behavioural response to the piling sound (i.e. the fish are being treated as static receptors), the potential range for both mortality and recoverable injury, when applying the SEL_{cum} metric, would be much greater, out to a modelled maximum of 830 m and 4,520 m from the source for recoverable injury in Group 1 and 2 fish respectively (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) for more information).

1.5.2.18 TTS is a temporary reduction in hearing sensitivity caused by intense sound. Normal hearing ability returns following cessation of the sound causing TTS, though the recovery period is variable, during which fish may have decreased fitness due to a reduced ability to communicate, detect predators or prey, and/or assess their environment. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) outlines the predicted ranges of effect for TTS for all fish groups modelled as moving receptors (based on SEL_{cum}) which may occur as a result of piling for one 5.5 m diameter pin pile, with TTS predicted to occur to a

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maximum range of 18.1 km from single piling operations. For fish species modelled as static receptors, TTS is predicted to occur out to a maximum range of 23.9 km from piling operations.

- 1.5.2.19 When concurrent piling is considered and modelled, the TTS ranges for fish modelled as moving receptors have a maximum range of 16.3 km, and fish modelled as stationary receptors have a maximum range of 22.1 km. These ranges are not significantly further than the impacts of the single piling and are thus unlikely to significantly increase the level of impact.
- 1.5.2.20 With respect to behaviour, fish species responses to construction-related underwater sound include a wide variety of behaviours, including startle (C-turn) responses; strong avoidance behaviour; changes in swimming or schooling behaviour, or changes of position in the water column. The Popper *et al.* (2014) guidelines provide qualitative behavioural criteria for fish from a range of sound sources, with the risk of behavioural effects on group 1 and group 2 fish from piling operations considered to be moderate to high in the near to intermediate field (i.e. hundreds of metres from piling operations) and low in the far field (i.e. in the range of kilometres from piling operations).
- 1.5.2.21 While behavioural effect thresholds proposed by Popper *et al.* (2014) are qualitative, a more quantitative assessment is presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3), using sound modelling outputs for the SPL_{pk} metric from three locations around the Morgan Array Area. The contours showed SPL_{pk} associated with the greatest hammer energy (4,400 kJ) for pin piles, and based on the studies summarised within Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3), it can be expected that behavioural effects on fish species (based on a threshold level of 160 dB re 1 μ Pa SPL_{pk}) could potentially occur out to ranges of approximately 18 km to 20 km (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1)). This range does not overlap with key freshwater habitats used by diadromous fish for spawning, or the coastline and relevant river mouths used during up and downstream migrations (see Figure 1.3). Use of the 160 dB re 1 μ Pa SPL_{pk} threshold value was discussed with the EWG in EWG03 (March 2023) and was presented in the PEIR (Technical Engagement Plan (Document Reference E4)). It should be noted that this contour is likely to be highly conservative for group 1 and group 2 fish species as these are known to be less sensitive to underwater sound (McCauley *et al.*, 2000).
- 1.5.2.22 Sound contours in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) indicated that whilst the 160 dB re 1 μ Pa SPL_{pk} contour for piling at the west location of the Morgan Array Area reached the Isle of Man using the maximum hammer energy for pin piles, this contour did not extend to the coast of Wales or England for any of the three modelled locations of piling as demonstrated by the north modelling location (Figure 1.3). The colours in Figure 1.3 provide a visual representation of sound levels, with red being the greatest sound, and green being the lowest sound.
- 1.5.2.23 Due to the large distance between the Morgan Array Area and the surrounding coastlines (22.22 km (12 nm) from the Isle of Man coastline, 37.13 km (20.11 nm) from the northwest coast of England and 58.58 km (31.6 nm) from the Welsh coastline (Anglesey) (when measured from Mean High Water Springs)) underwater sound would not represent a barrier to migration for those fish moving through the Irish Sea to/from the relevant SACs discussed below. Further, the modelled sound contours are for the greatest hammer energy for pin piles and therefore in most scenarios this hammer energy will not be used, and therefore smaller predicted distances to the sound level contours (and more limited behavioural effects) would be expected, with a resultant

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lower risk of barrier effects. In addition, as noted in Table 1.7, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a total piling phase (foundation installation) of up to two years within a four-year construction programme). As such, there is minimal risk of disruption to migration of lamprey species or Atlantic salmon.

1.5.2.24 Underwater sound modelling has also been completed for underwater sound associated with UXO clearance and detonation. Modelling was undertaken for a range of orders of detonation from a realistic worst case high order detonation to low order detonations (e.g. deflagration and clearance shots) to be used as mitigation to minimise sound levels. For the purposes of this assessment, it has been assumed that the MDS will be for clearance of UXO with a NEQ of 907 kg cleared by either low order or high order techniques (Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). The outputs of sound modelling for UXO clearance concluded that injury impacts may occur at a range of tens to hundreds of metres, depending on the size of the UXO cleared and the method of detonation (i.e. smaller ranges for low order detonation, larger ranges for high order detonation) with a maximum range of up to 985 m, when applying the SEL metric (see Volume 3, Annex 3.1: Underwater sound technical report (Document Reference F3.3.1)). This is within the impact range for elevated underwater sound during piling and hence, elevated underwater sound from UXO clearance will not be mentioned further in the assessment of adverse effects on site integrity for all European sites designated for Annex II diadromous fish features.

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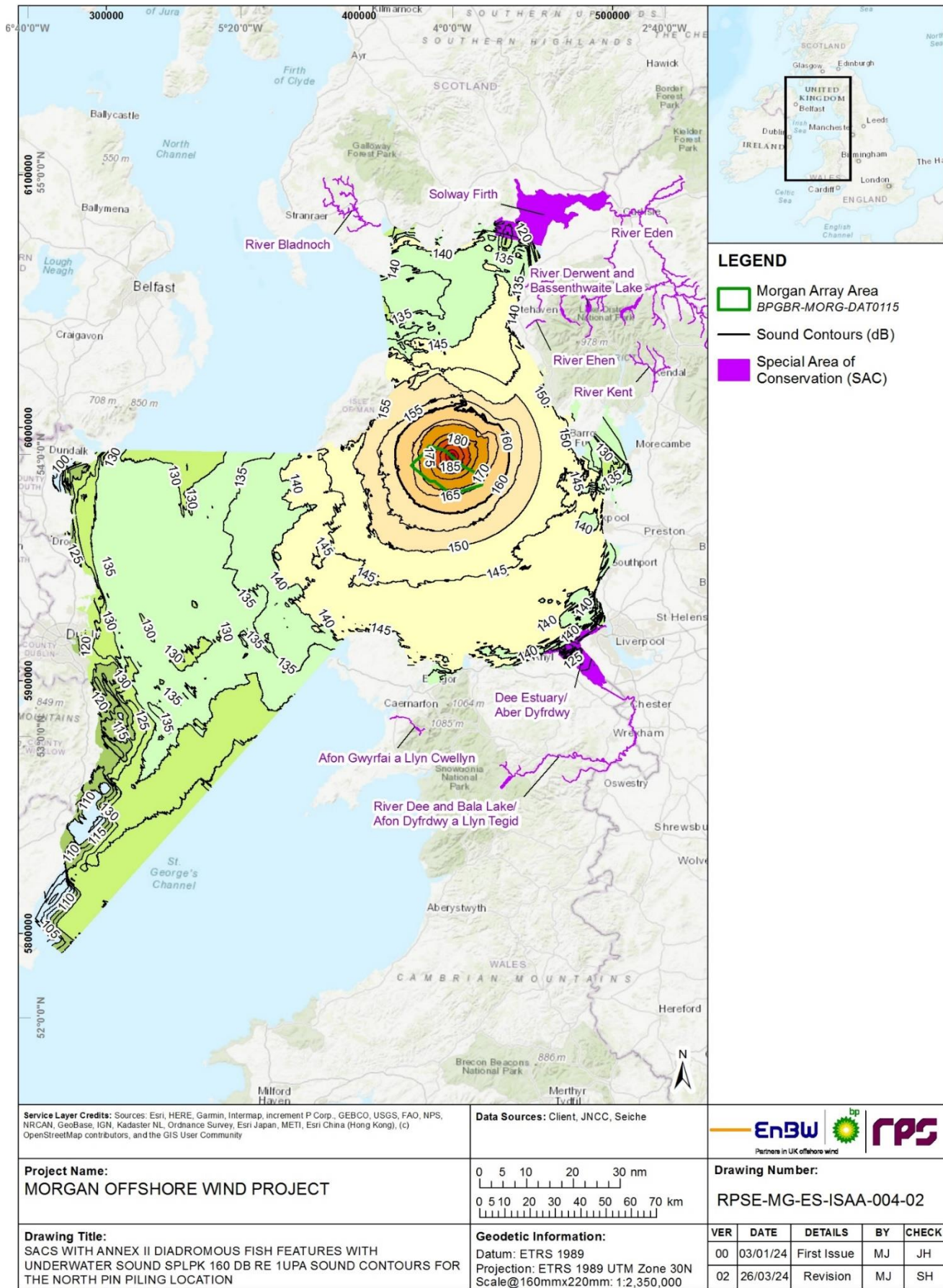


Figure 1.3: SACs with Annex II diadromous fish features with underwater sound SPLpk 160 dB re 1μPA sound contours¹ for the northeast piling location.

¹The colours provide a visual representation of sound levels, with red being the greatest sound, and green being the lowest sound.

River Ehen SAC

Atlantic salmon

- 1.5.2.25 As outlined in paragraphs 1.5.2.12 to 1.5.2.24, Atlantic salmon within close proximity to piling operations may experience injury or mortality. Atlantic salmon may be expected to migrate through the Fish and shellfish ecology study area during migration, however as described in paragraph 1.5.2.30, barrier effects will not occur. The measures adopted as part of Morgan Generation Assets (see Table 1.8 outlining the use of soft start piling procedures) will also allow some individuals in close proximity to piling to move away from the ensonified area, which further reduces the likelihood of injury and mortality on Atlantic salmon features.
- 1.5.2.26 Research from Harding *et al.* (2016) failed to produce physiological or behavioural responses in Atlantic salmon when subjected to sound similar to piling. However, the sound levels tested were estimated at <160 dB re 1 μ Pa SPL_{rms}, below the level at which injury or behavioural disturbance would be expected for Atlantic salmon. Nedwell *et al.* (2006) used the slightly less sensitive sea trout as a model for comparison to Atlantic salmon, and found no significant behavioural response from piling activities, with modelling suggesting a similar response in Atlantic salmon and sea trout. Physical impacts on migrating salmonids have been noted from piling producing sounds of 218 dB re 1 μ Pa SPL_{rms} (Bagocius, 2015), although at these sound levels, it would be expected that avoidance reactions would occur, thus avoiding injury impacts.
- 1.5.2.27 The sound modelling outputs discussed in paragraph 1.5.2.20 to 1.5.2.23 indicated that piling related underwater sound would result in behavioural responses within a range of approximately up to tens of kilometres, although these would not extend close to the coasts of North Wales and therefore would not represent a barrier to migration. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase). As such, there is negligible risk of disruption to migration of these species.
- 1.5.2.28 For SPL_{pk} when piling is at 4,400 kJ (its maximum), mortality and recoverable injury for group 2 fish may occur within a maximum of 207 m. For the SEL_{cum} metric, mortality and injury ranges were calculated for piling activities where fish are modelled as static receptors, and receptors moving from a sound source. These mortality and injury ranges indicate that when fish are modelled as receptors moving away from the sound source with the implementation of soft start initiation, the mortality injury ranges are considerably smaller than those predicted for static receptors. Specifically, the mortality thresholds were not exceeded for group 2 fish with recoverable injury occurring within a maximum of 254 m. For static receptors using the SEL_{cum} metric, this modelling for group 2 fish showed a maximum mortality range of up to 1,870 m, and a recoverable injury range of up to 4,520 m.
- 1.5.2.29 The injury ranges presented indicate that injury may occur out to ranges of hundreds of metres for SPL_{pk}. Realistically, the risk of fish injury overall will be considerably lower due to the hammer energies used being lower than the absolute maximum modelled. The expected behaviour of some species of fish moving away from the area affected when exposed to high levels of sound and the soft start procedure, also mean that it is likely that reactive fish will have sufficient time to vacate the areas where injury may occur prior to sound levels reaching a level causing mortality.

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1.5.2.30 Atlantic salmon may be expected to migrate through the Fish and shell fish ecology study area during migration, however, they are highly mobile and given the vast extent of their migratory range relative to the extent of the Zol of underwater sound impacts, barrier effects would not occur. Given this, significant mortality of Atlantic salmon is not anticipated.

Freshwater pearl mussel

1.5.2.31 Adult freshwater pearl mussel is confined to freshwater habitats therefore there is no pathway for direct effects to this species during the construction and decommissioning of the Morgan Generation Assets as a result of underwater sound.

1.5.2.32 There is potential however for indirect adverse effects on the larval stage of freshwater pearl mussel if there are adverse effects on the individual salmon (their host species for the first year of their life) to which they are attached. The assessment for Atlantic salmon above (paragraphs 1.5.2.25 to 1.5.2.27) concluded that underwater sound emissions will not lead to significant adverse effects on the population, distribution or supporting habitats of the River Ehen SAC Atlantic salmon, therefore it can also be concluded that there will be no adverse indirect impacts on freshwater pearl mussel.

Conclusions

1.5.2.33 It is concluded that no adverse effects on Atlantic salmon and freshwater pearl mussel which could undermine the conservation objectives of the River Ehen SAC, will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of 'underwater sound' against each relevant conservation objective (as presented in paragraph 1.5.1.9) is presented in Table 1.9. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.9: Conclusions against the conservation objectives of the Riven Ehen SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are maintained/restored	There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon and freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon and freshwater pearl mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being maintained or restored.
The structure and function of the habitats of qualifying species are maintained/restored	
The supporting processes on which the habitats of qualifying species rely are maintained/restored	
The populations of qualifying species are maintained/restored	Atlantic salmon within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, will only travel through the impacted area during migration and the use of soft start piling procedures may allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Atlantic salmon may experience behavioural effects in response to piling in the vicinity of the Morgan Generation

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Conservation Objective	Conclusion
The distributions of qualifying species within the site are maintained/restored	Assets however, modelling indicates these effects would not result in barriers to migration to and from this SAC and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the populations or the distributions of Atlantic salmon or freshwater pearl mussel from being maintained or restored.

1.5.2.34 Therefore, it can be concluded that there is **no risk of an adverse effect on the integrity** of the River Ehen SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and river lamprey

1.5.2.35 As outlined in paragraphs 1.5.2.12 to 1.5.2.24, sea lamprey features within close proximity to piling operations may experience injury or mortality. Relating to injury and mortality, for SPL_{pk} , when piling energy is at 4,400 kJ (its maximum), the maximum range for group 1 fish is 215 m. For SEL_{cum} , mortality and injury ranges were calculated for piling activities wherein fish are modelled as both static receptors and receptors moving away from the sound source. These ranges indicate that when fish are modelled as receptors moving away from the sound source with the implementation of soft start initiation, mortality injury ranges are considerably smaller than those predicted for static receptors and that the mortality and injury thresholds were not exceeded for group 1 fish.

1.5.2.36 For static receptors, the modelling showed a maximum mortality range of up to 546 m in group 1 fish, and a recoverable injury range of up to 830 m for group 1 fish. For moving receptors, the modelling showed that mortality and injury thresholds were not exceeded. Realistically, the risk of fish injury overall will be considerably lower due to the hammer energies used being lower than the absolute maximum modelled. The expected behaviour of some species of fish moving away from the area affected when exposed to high levels of sound and the soft start procedure, also mean that it is likely that reactive fish will have sufficient time to vacate the areas and under this scenario injury and mortality thresholds would not be exceeded for group 1 fish.

1.5.2.37 Lamprey may be expected to migrate through the Fish and shellfish ecology study area during migration, however they are highly mobile and given the vast extent of their migratory range relative to the extent of the zone of influence of underwater sound impacts, the impact is unlikely to result in significant mortality of lamprey species. The measures adopted as part of the Morgan Generation Assets (see Table 1.8 which outlines the use of soft start piling procedures) may also allow reactive individuals in close proximity to piling to move away from the ensonified area, further reducing the likelihood of injury and mortality on sea lamprey features.

1.5.2.38 Lamprey species associated with the Dee Estuary/Aber Dyfrdwy SAC may experience behavioural effects in response to piling sound, including a startle response, disruption of feeding, or avoidance of an area. For lamprey species (considered the least sensitive to underwater sound compared with other diadromous fish species)

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behavioural responses may occur within a range of approximately up to tens of kilometres from piling operations (see paragraph 1.5.2.21).

1.5.2.39 Lamprey species are known to have relatively simple ear structures (Popper and Hoxter, 1987), with very few responses to auditory stimuli noted overall (Popper, 2005), except a slight swimming speed increase and decrease in resting behaviour when exposed to continuous low frequency sound of 50-200 Hz (Mickle *et al.*, 2019), suggesting a low vulnerability to sound impacts overall.

1.5.2.40 The sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) discussed in the previous sections indicate that piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets although these would not extend close to the coasts of North Wales (i.e. Dee Estuary/Aber Dyfrdwy SAC, which is located a considerable distance (70.1 km) from the Morgan Generation Assets) and therefore would not represent a barrier to migration. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase). As such, there is negligible risk of disruption to migration of the lamprey qualifying species of the Dee Estuary/Aber Dyfrdwy SAC.

Conclusions

1.5.2.41 It is concluded that no adverse effects on the lamprey species which could undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of ‘underwater sound’ against each relevant conservation objective (as presented in paragraph 1.5.1.16 and 1.5.1.18) is presented in Table 1.10. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.10: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality</p>	<p>There is no pathway for underwater sound to result in adverse effects on the habitats of river and sea lampreys. Modelling indicates that any behavioural effects in response to piling will not result in any barriers to migration to and from this SAC, and sound potential impacts will be short-term and intermittent during the construction phase. There is no route to impact for underwater sound to affect water quality or to physically obstruct the migratory passage of lamprey species. As such there is negligible risk of disruption to migration of lamprey. Therefore, the migratory passage of both adult and juvenile river lamprey through the Dee Estuary between Liverpool Bay and the River Dee will be unobstructed by physical barriers and/or poor water quality.</p>

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Conservation Objective	Conclusion
<p>The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000)</p>	<p>Sea lamprey and river lamprey within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, so significant mortality or injury is not predicted.</p> <p>Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Morgan Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 70.1 km from the Morgan Generation Assets), and potential impacts from underwater sound will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not result in the reduction of sea lamprey or river lamprey populations.</p>
<p>The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.</p>	<p>Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that for prey species of the sea lamprey and river lamprey potential impacts from underwater sound will not be significant with the exception of herring which was concluded to be moderate adverse during the herring spawning season only. Although, there is evidence that lamprey features may prey on herring, herring is predicted to form only a very small proportion of sea and river lamprey's diet with lamprey predicted to be able to switch prey to other species such as sprat, flounder and small gadoids. Furthermore, the development of an UWSMS (with an Outline UWSMS submitted as part of the application, (Document Reference J13), secured in the deemed marine licences, to reduce the magnitude associated with significant impacts (in this case to negligible or low) such that there will be no residual significant effect for the project alone. In doing so, this is anticipated to reduce the significance of effect to herring to minor adverse (in EIA terms). In this way, underwater sound will not prevent the abundance of prey species forming the river and sea lamprey's food resource within the estuary from being maintained.</p>

1.5.2.42 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Dee Estuary/Aber Dyfrdwy SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

River Derwent and Bassenthwaite Lake SAC

Sea lamprey and river lamprey

1.5.2.43 Potential impacts of underwater sound on sea lamprey and river lamprey features of the River Derwent and Bassenthwaite Lake SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan

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Generation Assets outlined in paragraphs 1.5.2.35 to 1.5.2.42). That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the River Derwent and Bassenthwaite Lake SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

- 1.5.2.44 In addition, as the River Derwent and Bassenthwaite Lake SAC (71.2 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC, it is considered that effects on the lamprey features of this site would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable, although specific consideration of conservation objectives for this SAC are presented in Table 1.11. As such no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the Derwent and Bassenthwaite Lake SAC.

Atlantic salmon

- 1.5.2.45 Potential impacts of underwater sound on Atlantic salmon features of the River Derwent and Bassenthwaite Lake SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.25 to 1.5.2.27. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration for Atlantic salmon (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the River Derwent and Bassenthwaite Lake SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

- 1.5.2.46 In addition, as the River Derwent and Bassenthwaite Lake SAC (71.2 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generations Assets than the River Ehen SAC, it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.11. As such, no Adverse Effect on Integrity was concluded for the Atlantic salmon feature of the Derwent and Bassenthwaite Lake SAC.

Conclusions

- 1.5.2.47 It is concluded that no adverse effects on river and sea lampreys and Atlantic salmon which undermine the conservation objectives of the River Derwent and Bassenthwaite Lake SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of 'underwater sound' against each relevant conservation objective (as presented in paragraph 1.5.1.23 to 1.5.1.25) is presented in Table 1.11.

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Table 1.11: Conclusions against the conservation objectives of the River Derwent and Bassenthwaite Lake SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are maintained/restored	There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river sea lamprey rely from being maintained or restored.
The structure and function of the habitats of qualifying species are maintained/restored	
The supporting processes on which the habitats of qualifying species rely are maintained/restored	
The populations of qualifying species are maintained/restored	Atlantic salmon, sea lamprey and river lamprey within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures may allow individuals in close proximity of piling to move away from the ensonified area, so significant mortality or injury is not predicted.
The distributions of qualifying species within the site are maintained/restored	Atlantic salmon, sea lamprey and river lamprey may experience behavioural effects in response to piling in the vicinity of the Morgan Generation Assets however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 71.2 km from the Morgan Generation Assets) and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the populations or the distributions of Atlantic salmon, sea lamprey and river lamprey from being maintained or restored.

1.5.2.48 It can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Derwent and Bassenthwaite Lake SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

River Kent SAC

Freshwater pearl mussel

1.5.2.49 Adult freshwater pearl mussels are confined to freshwater habitats; therefore, there is no pathway for direct effects to this species during the construction and decommissioning of the Morgan Generation Assets as a result of underwater sound.

1.5.2.50 There is potential however for indirect adverse effects on the larval stage of freshwater pearl mussel if there are adverse effects on the individual salmon (their host species for the first year of their life) to which they are attached. The assessment for Atlantic

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salmon for the River Derwent and Bassenthwaite SAC, the closest SAC designated for Atlantic salmon, as presented in paragraphs 1.5.2.45 to 1.5.2.46, concluded that underwater sound emissions will not lead to significant adverse effects on the population, distribution or supporting habitats of Atlantic salmon. Therefore, it can also be concluded that there will be no significant indirect effects to freshwater pearl mussel.

Conclusions

1.5.2.51 It is concluded that no adverse effects on freshwater pearl mussel which could undermine the conservation objectives of the River Kent SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact ‘underwater sound’ against each relevant conservation objective (as presented in paragraphs 1.5.1.29 to 1.5.1.30) is presented in Table 1.12. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.12: Conclusions against the conservation objectives of the River Kent SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are restored	There is no pathway for underwater sound to result in adverse effects on the habitats of freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the extent, distribution, structure or function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being restored.
The structure and function of the habitats of qualifying species are restored	
The supporting processes on which the habitats of qualifying species rely are restored	
The populations of qualifying species are restored	Given that no direct effects are anticipated for freshwater pearl mussel features of the River Kent SAC and significant adverse effects are not anticipated for Atlantic salmon populations (see paragraphs 1.5.2.45 to 1.5.2.46), underwater sound associated with Morgan Generation Assets will not prevent the population and distribution of freshwater pearl mussel from being restored.
The distributions of qualifying species within the site are restored	

1.5.2.52 It can therefore be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Kent SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

Solway Firth SAC

Sea lamprey and river lamprey

1.5.2.53 Underwater sound effects on sea lamprey and river lamprey features of the Solway Firth SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan Generation Assets) outlined in paragraph 1.5.2.35 to 1.5.2.42. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and

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Northwest England and therefore would not represent a barrier to migration (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the Solway Firth SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.5.2.54 In addition, the Solway Firth SAC (84.7 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable, although specific consideration of conservation objectives for this SAC are presented in Table 1.13. As such no adverse effect on the integrity was concluded on the sea lamprey and river lamprey features of the Solway Firth SAC.

Conclusions

1.5.2.55 It is concluded that no adverse effects on sea lamprey and river lamprey which could undermine the conservation objectives of the Solway Firth SAC will occur as a result of potential underwater sound impacts during the construction and decommissioning phases. An assessment of the impact of ‘underwater sound’ against each relevant conservation objective (as presented in paragraph 1.5.1.35 to 1.5.1.36) is presented in Table 1.13. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.13: Conclusions against the conservation objectives of the Solway Firth SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are maintained/restored	There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the extent, distribution, structure or function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.
The structure and function of the habitats of qualifying species are maintained/restored	
The supporting processes on which the habitats of qualifying species rely are maintained/restored	
The populations of qualifying species are maintained/restored	Sea lamprey and river lamprey within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures may allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted.
The distributions of qualifying species within the site are maintained/restored	Sea lamprey and river lamprey may experience behavioural effects in response to piling in the vicinity of the Morgan Generation Assets however, modelling indicates these effects would not result in barriers to migration to and from this SAC (located 84.7 km from the Morgan Generation Assets) and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the populations or the distributions of sea lamprey and river lamprey from being maintained or restored.

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1.5.2.56 It can therefore be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Solway Firth SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

River Bladnoch SAC

Atlantic salmon

1.5.2.57 Underwater sound effects on Atlantic salmon features of the River Bladnoch SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.25 to 1.5.2.27. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration for Atlantic salmon (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the River Bladnoch SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.5.2.58 In addition, as the River Bladnoch SAC (89.8 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generations Assets than the River Ehen SAC it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.14. As such, no Adverse Effect on Integrity was concluded for the Atlantic salmon feature of the River Bladnoch SAC.

Conclusions

1.5.2.59 It is concluded that no adverse effects on Atlantic salmon which could undermine the conservation objectives of the River Bladnoch SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of ‘underwater sound’ against each relevant conservation objective (as presented in paragraph 1.5.1.40) is presented in Table 1.14. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.14: Conclusions against the conservation objectives of the River Bladnoch SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
Restore the population of the species, including range of genetic types, as a viable component of the site	Atlantic salmon within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures may allow reactive individuals in close proximity of piling to move away from the ensounded area, significant mortality or injury is not predicted. Atlantic salmon may experience behavioural effects in response to piling in the vicinity of the Morgan Generation Assets. However,

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Conservation Objective	Conclusion
Restore the distribution of the species throughout the site	modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 89.8 km from the Morgan Generation Assets), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the restoration of the population of Atlantic salmon as a viable component of the site and its distribution throughout the site.
Restore the habitats supporting the species within the site and availability of food	There is no pathway for underwater sound to result in adverse effects on the habitats supporting Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the habitats supporting Atlantic salmon within the site and availability of food from being restored.

1.5.2.60 It can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Bladnoch SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

Sea lamprey and river lamprey

1.5.2.61 Underwater sound effects on the sea lamprey and river lamprey qualifying species of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan Generation Assets) outlined in paragraph 1.5.2.35 to 1.5.2.42. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.5.2.62 In addition, as the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (92.4 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable, although specific consideration of conservation objectives for this SAC are presented in Table 1.15. As such no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC.

Atlantic salmon

1.5.2.63 Underwater sound effects on Atlantic salmon features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC are predicted to be similar to those associated

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with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraph 1.5.2.25 to 1.5.2.27. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration for Atlantic salmon (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.5.2.64 In addition, as the the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (92.4 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the River Ehen SAC it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.15. As such, no Adverse Effect on Integrity was concluded for the Atlantic salmon feature of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC.

Conclusions

1.5.2.65 It is concluded that no adverse effects on sea lamprey, river lamprey and Atlantic salmon which could undermine the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of ‘underwater sound’ against each relevant conservation objective (as presented in paragraphs 1.5.1.47 to 1.5.1.48) is presented in Table 1.15. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.15: Conclusions against the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The parameters defined in the vision for the watercourse as outlined in NRW (2022b) must be met	Due to the nature of the impact, and the distance of the Morgan Array Area from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (92.4 km), there is no route to impact and underwater sound associated with the Morgan Generation Assets will not prevent the defined vision for the watercourse from being met. There will be no reduction in the area or quality of habitat for the population Atlantic salmon, sea lamprey and river lamprey of in the SAC on a long-term basis.
There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.	
The SAC feature populations will be stable or increasing over the long term	Atlantic salmon, sea lamprey and river lamprey within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures may allow reactive individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Atlantic salmon, sea lamprey and river lamprey may experience behavioural effects in response to piling in the vicinity of the Morgan Array Area however, modelling indicates these effects

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Conservation Objective	Conclusion
The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.	would not result in barriers to migration to and from this SAC (which is located 92.4 km from the Morgan Generation Assets) and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the populations of Atlantic salmon, sea lamprey and river lamprey from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets will not reduce or likely reduce, in the foreseeable future, the natural range of Atlantic salmon, sea lamprey and river lamprey within the site.
All factors affecting the achievement of these conditions are under control.	Given the conclusions made for the other conservation objectives above, it is considered that all factors affecting the achievement of these conditions will remain under control.

1.5.2.66 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

Afon Gwyrfaï a Llyn Cwellyn SAC

Atlantic salmon

1.5.2.67 Underwater sound effects on the Atlantic salmon features of the Afon Gwyrfaï a Llyn Cwellyn SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.25 to 1.5.2.27. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration for Atlantic salmon (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the Afon Gwyrfaï a Llyn Cwellyn SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.5.2.68 In addition, as the Afon Gwyrfaï a Llyn Cwellyn SAC (117.9 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the River Ehen SAC, it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.16 Table 1.11. As such, no Adverse Effect on Integrity was concluded for the Atlantic salmon feature of the Afon Gwyrfaï a Llyn Cwellyn SAC.

Conclusions

1.5.2.69 It is concluded that no adverse effects on Atlantic salmon which undermine the conservation objectives of the Afon Gwyrfaï a Llyn Cwellyn SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of

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‘underwater sound’ against each relevant conservation objective (as presented in paragraph 1.5.1.52) is presented in Table 1.16. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.16: Conclusions against the conservation objectives of the Afon Gwyrfaï a Llyn Cwellyn SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The conservation objective for the water course as outlined in NRW (2022c) must be met</p>	<p>Considering the distance from the Morgan Generation Assets to the Afon Gwyrfaï a Llyn Cwellyn SAC (117.9 km) and the nature of the impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the conservation objectives for the water course from being met.</p>
<p>The population of the feature in the SAC is stable or increasing over the long term</p>	<p>Atlantic salmon within tens to hundreds of metres of piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures may allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted.</p>
<p>The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future</p>	<p>Atlantic salmon may experience behavioural effects in response to piling in the vicinity of the Morgan Generation Assets however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 117.9 km from the Morgan Generation Assets), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the population of Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets will not reduce or likely reduce, in the foreseeable future, the natural range of Atlantic salmon within the site.</p>
<p>The Gwyrfaï will continue to be a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis</p>	<p>Considering the distance from the Morgan Generation Assets to the Afon Gwyrfaï a Llyn Cwellyn SAC (117.9 km) and the nature of the impact, there is no pathway for underwater sound to result in adverse effects on the habitats supporting Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets will not reduce the area of the habitats of Atlantic salmon and the Gwyrfaï will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the Afon Gwyrfaï a Llyn Cwellyn SAC on a long-term basis.</p>

1.5.2.70 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Afon Gwyrfaï a Llyn Cwellyn SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

River Eden SAC

Sea lamprey and river lamprey

1.5.2.71 Underwater sound effects on sea lamprey and river lamprey features of the River Eden SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan Generation Assets) outlined in paragraph 1.5.2.35 to 1.5.2.42. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Morgan Generation Assets, these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration (see paragraphs 1.5.2.12 to 1.5.2.24) to and from the River Eden SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.5.2.72 In addition, as the River Eden SAC (125.6 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable, although specific consideration of conservation objectives for this SAC are presented in Table 1.17. As such no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the River Eden SAC. No Adverse Effect on Integrity was concluded for the Dee Estuary/Aber Dyfrdwy SAC (see paragraph 1.5.2.42), therefore no adverse effect on the sea lamprey and river lamprey features of the River Eden SAC can also be concluded.

Atlantic salmon

1.5.2.73 Underwater sound effects on Atlantic salmon features of the River Eden SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.25 to 1.5.2.27. As the River Eden SAC (125.6 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generations Assets than the River Ehen SAC it is considered that effects would be of similar if not of a lower magnitude. No Adverse Effect on Integrity was concluded for the River Ehen SAC (see paragraph 1.5.2.34), therefore no adverse effect on the Atlantic salmon feature of the River Eden can also be concluded.

Conclusions

1.5.2.74 It is concluded that no adverse effects on sea lamprey, river lamprey and Atlantic salmon which undermine the conservation objectives of the River Eden SAC will occur as a result of potential underwater sound impacts during construction and decommissioning activities for the Morgan Generation Assets. An assessment of the impact of 'underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.58 to 1.5.1.59) is presented in Table 1.17. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.17: Conclusions against the conservation objectives of the River Eden SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are restored	There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river sea lamprey rely from being maintained or restored.
The structure and function of the habitats of qualifying species are restored	
The supporting processes on which the habitats of qualifying species rely are restored	
The populations of qualifying species are maintained or restored	Atlantic salmon, sea lamprey and river lamprey within tens to hundreds of metres of piling operations may experience injury or mortality. Although these species may be expected to migrate through the Fish and shellfish ecology study area during migration, they are highly mobile and given the vast extent of their migratory range relative to the extent of the zone of influence of underwater sound impacts, the impact is unlikely to result in significant mortality or injury. In addition, the use of soft start piling procedures may allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted.
The distributions of qualifying species within the site are maintained or restored	Atlantic salmon, sea lamprey and river lamprey may experience behavioural effects in response to piling in the vicinity of the Morgan Generation Assets however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 125.6 km from the Morgan Generation Assets) and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets will not prevent the populations or the distributions of Atlantic salmon, sea lamprey and river lamprey from being maintained or restored.

1.5.2.75 It can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Eden SAC as a result of underwater sound emissions with respect to the construction and decommissioning of the Morgan Generation Assets alone.

EMF from subsea electrical cabling

1.5.2.76 The presence and operation of inter-array and interconnector cables as part of the Morgan Generation Assets will lead to localised potential EMF impacts, which may affect Annex II diadromous fish features and freshwater pearl mussel.

1.5.2.77 The assessment of LSE in the HRA Stage 1 Screening Report (Document Reference E1.4) identified that during the operations and maintenance phase, LSE could not be ruled out for the potential impacts of EMF from subsea electric cables. This relates to the European sites and relevant Annex II features listed in Table 1.18.

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Table 1.18: European sites and relevant Annex II diadromous fish features from which potential for an LSE could not be ruled out in relation to EMF impacts.

SAC	Annex II diadromous fish features
River Ehen SAC	<ul style="list-style-type: none"> • Atlantic salmon • Freshwater pearl mussel.
Dee Estuary/Aber Dyfrdwy SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey.
River Derwent and Bassenthwaite Lake SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon.
River Kent SAC	<ul style="list-style-type: none"> • Freshwater pearl mussel
Solway Firth SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey.
River Bladnoch SAC	<ul style="list-style-type: none"> • Atlantic salmon
River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon.
Afon Gwyrfai a Llyn Cwellyn SAC	<ul style="list-style-type: none"> • Atlantic salmon
River Eden SAC	<ul style="list-style-type: none"> • Sea lamprey • River lamprey • Atlantic salmon.

- 1.5.2.78 The following sections explain how this potential impact on Annex II diadromous fish features of the identified SACs has been quantified and assessed.
- 1.5.2.79 The MDS considered for the assessment of potential impacts on Annex II diadromous fish features from EMF from subsea electrical cabling effects is presented in Table 1.19.
- 1.5.2.80 For the purposes of the assessment sea lamprey and river lamprey have been assessed together due to their similar sensitivity to EMF from subsea electrical cabling and the fact that their conservation objectives are the same for both species at all European sites assessed and therefore effects and associated conclusions are considered to be alike.

Table 1.19: Maximum design scenario considered for the assessment of potential impacts on diadromous fish from EMF from subsea electric cables.

Phase	MDS	Justification
Operations and maintenance phase	Presence of inter-array and interconnector cables: <ul style="list-style-type: none"> • Inter-array cables: up to 390 km of inter-array cables of 66 kV to up to 132 kV • Interconnector cables: up to 60 km of up to 275 kV High Voltage Alternating Current (HVAC) cables • Minimum burial depth 0.5 m 	Maximum length of cables across the Morgan Array Area and minimum burial depth (the greater the burial depth, the more the EMF from subsea electrical cabling is attenuated).

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Phase	MDS	Justification
	<ul style="list-style-type: none"> Operation and maintenance phase of up to 35 years. 	

Measures adopted as part of Morgan Generation Assets

1.5.2.81 Table 1.20 outlines the measures adopted as part of Morgan Generation Assets which are relevant to effects on Annex II diadromous fish features during the operations and maintenance phase from EMF associated with subsea electric cables.

Table 1.20: Measures adopted as part of the Morgan Generation Assets which are relevant to EMF from subsea electrical cabling effects.

Measure	Justification	How the measure will be secured
Development of, and adherence to, an Offshore Construction Method Statement (CMS) including Cable Specification and Installation Plan (CSIP) which will include cable burial where possible and cable protection	<p>To minimise potential impact from the cables and removal of cables a commitment to bury cables where possible has been made in accordance with the specific policies set out in the Welsh Marine Plan (Welsh Government, 2019) and additionally the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021).</p> <p>The Applicant recognises that the best form of cable protection is achieved through cable burial to the required depths, according to the results of a Cable Burial Risk Assessment and Burial Assessment Study, which will be included within the CSIP.</p> <p>The burial methodology should select the appropriate tools to endeavour to achieve burial to the required depth of lowering in a single pass, seeking to avoid burial methods that require multiple passes with a burial tool in order to achieve lowering of the cable.</p> <p>While burial of cables will not reduce the strength of EMF, it does increase the distance between cables and fish and shellfish receptors, thereby potentially reducing the potential effect on those receptors.</p>	Offshore CMS secured as a condition of the deemed marine licence(s) within the draft DCO (Document Reference C1).

Operations and maintenance phase

Information to support assessment

1.5.2.82 EMF comprise both the electrical fields, measured in volts per metre (V/m), and the magnetic fields, measured in microtesla (µT) or milligauss (mG). Background measurements of the magnetic field are approximately 50 µT (i.e. 500 mG) for example in the North Sea (Tasker *et al.*, 2010). It is common practice to block the direct electrical field using conductive sheathing, meaning that the only EMFs that are emitted into the marine environment are the magnetic field and the resultant induced electrical field. It is generally considered impractical to assume that cables can be buried at depths that will reduce the magnitude of the magnetic field, and hence the sediment-sea water interface induced electrical field, to below that at which these fields

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could be detected by certain marine organisms on or close to the seabed (Gill *et al.*, 2005; Gill *et al.*, 2009). By burying a cable, the magnetic field at the seabed is reduced due to the distance between the cable and the seabed surface as a result of field decay with distance from the cable (CSA, 2019).

- 1.5.2.83 EMFs may interfere with the navigation of sensitive diadromous species. Species for which there is evidence of a response to E (the electrified field vector) and/or B (the magnetic field vector) fields (the electric field produced around a static electric charge, whilst the magnetic field produced around the moving charge) include river lamprey, sea lamprey, European eel, and Atlantic salmon (Gill *et al.*, 2005; CSA, 2019).
- 1.5.2.84 A variety of design and installation factors affect EMF levels in the vicinity of the cables. These include current flow, distance between cables, cable insulation, number of conductors, configuration of cable and burial depth. The flow of electricity associated with an Alternating Current (AC) cable changes direction (as per the frequency of the AC transmission) and creates a constantly varying electric field in the surrounding marine environment (Huang, 2005), which can be contained with a metallic screen or sheath.
- 1.5.2.85 The strength of the magnetic field (and consequently, induced electrical fields) decreases rapidly radially with distance from the source according to the inverse square law. A recent study conducted by CSA (2019) found that inter-array and offshore export cables buried between depths of 1 m to 2 m reduces the magnetic field at the seabed surface four-fold. For cables that are unburied and instead protected by thick concrete mattresses or rock berms, the field levels were found to be similar to buried cables.
- 1.5.2.86 Further information on the EMF from subsea electrical cabling levels associated with offshore wind farm power cables is included within Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3).

River Ehen SAC

Atlantic salmon

- 1.5.2.87 Atlantic salmon have been found to possess magnetic material of a size suitable for magnetoreception, and these species can use the earth's magnetic field for orientation and direction-finding during migration (Gill and Bartlett, 2010; CSA, 2019). Mark and recapture experiments undertaken at the Nysted operational offshore wind farm showed that eel did cross the offshore export cable (Hvidt *et al.*, 2003).
- 1.5.2.88 Studies on European eel in the Baltic Sea have highlighted some limited effects of subsea cables (Westerberg and Lagenfelt, 2008), with evidence of direct detection of EMF through the lateral line of this species (Moore and Riley, 2009). The swimming speed during migration was shown to change in the short term (tens of minutes) with exposure to AC electric subsea cables, even though the overall direction remained unaffected (Westerberg and Langenfelt, 2008). The authors concluded that any delaying effect (i.e. on average 40 minutes) would not be likely to influence fitness in a 7,000 km migration, with little to no impact on migratory behaviour noted beyond 500 m from wind farm development infrastructure (Ohman *et al.*, 2007). While this study was undertaken on European eel, this indicates that fish behavioural effects in response to EMF from subsea electrical cables are limited both temporally and spatially and these do not cause barriers to migration.
- 1.5.2.89 Research in Sweden on the effects of a High Voltage Direct Current cable on the migration patterns of a range of fish species, including salmonids, failed to find any effect (Westerberg *et al.*, 2007; Wilhelmsson *et al.*, 2010). Research conducted at the

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Trans Bay cable, a direct current (DC) undersea cable near San Francisco, California, found that migration success and survival of chinook salmon *Oncorhynchus tshawytscha* was not impacted by the cable. However, behavioural changes were noted when these fish were near the cable with salmon appearing to remain around the cable for longer periods (Kavet *et al.*, 2016). These studies demonstrate that while DC subsea power cables can result in altered patterns of fish behaviour, these changes are temporary and do not interfere with migration success or population health.

1.5.2.90 As outlined in paragraphs 1.5.2.82 to 1.5.2.86, the Morgan Generation Assets could potentially cause Atlantic salmon features to alter their migration route, however as discussed above, it is considered more likely that migratory behaviour will not be altered in terms of direction and rather that swimming speed may be reduced when in proximity to EMF from subsea electric cables.

1.5.2.91 Any EMF from subsea electric cables impacts will be localised in context with the wider Irish Sea region and will not present a barrier to migration to and from the SAC. Any behavioural effects will be further minimised by the burial of cables (see Table 1.20). Given the limited range of effect, there is no pathway for effect between EMF from subsea electrical cabling and the extent or quality of the habitats of the qualifying species.

Freshwater pearl mussel

1.5.2.92 The freshwater pearl mussel has been considered within this HRA Stage 2 ISAA Part 2 – SAC assessments report as Atlantic salmon are host species during a critical parasitic phase of the mussel’s lifecycle. There could therefore be an indirect potential impact upon the freshwater pearl mussel feature of the site if the salmon population is adversely affected. However, as outlined in paragraphs 1.5.2.87 to 1.5.2.91. it is not anticipated that Atlantic salmon will be adversely affected. Therefore, no adverse effects on the freshwater pearl mussel can also be concluded.

Conclusions

1.5.2.93 It is concluded that no adverse effects on Atlantic salmon and freshwater pearl mussel which could undermine the conservation objectives of the River Ehen SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase of the Morgan Generation Assets. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraph 1.5.1.9) is presented in Table 1.21. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.21: Conclusions against the conservation objectives of the River Ehen SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are restored	There is no pathway for effect between EMF from subsea electrical cabling and the habitats of Atlantic salmon and freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure or function of the habitats of Atlantic salmon and
The structure and function of the habitats of qualifying species are restored	

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Conservation Objective	Conclusion
The supporting processes on which the habitats of qualifying species rely are restored	freshwater pearl mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being restored.
The populations of qualifying species are restored	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electrical cabling and that any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon. For these reasons, and given the distance of the SAC from the Morgan Generation Assets (62.5 km) the populations and distributions of Atlantic salmon and freshwater pearl mussel will not be prevented from being maintained or restored.
The distributions of qualifying species within the site are restored	

1.5.2.94 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Ehen SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and river lamprey

1.5.2.95 EMF from subsea electrical cabling may interfere with the navigation of sensitive diadromous species. Lamprey possess specialised ampullary electroreceptors that are sensitive to weak, low frequency electric fields (Bodznick and Northcutt, 1981; Bodznick and Preston, 1983), which are hypothesised to be used for prey-detection, although further research is required in this area (Tricas and Carlston, 2012). Chung-Davidson *et al.* (2008) found that weak electric fields may play a role in the reproduction of sea lamprey and it was suggested that electrical stimuli mediate different behaviours in the feeding-stage and spawning-stage of individuals. This study showed that migration behaviour of sea lamprey was affected (i.e. adults did not move) when stimulated with electrical fields of intensities of between 2.5 m and 100 m V/m, with normal behaviour observed at electrical field intensities higher and lower than this range (Chung-Davidson *et al.*, 2008). It should be noted, however, that these levels are considerably higher than modelled induced electrical fields expected from AC subsea cables (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). There is currently no evidence of lamprey responses to magnetic B fields (Gill and Bartlett, 2010).

1.5.2.96 As outlined in paragraph 1.5.2.95, EMF from subsea electrical cabling may influence the behaviour of lamprey species. These effects may be detrimental if they result in the creation of a barrier to migration routes to and from natal rivers. However, diadromous species such as lamprey are highly mobile and are considered to be capable of changing course during migration between natal rivers and the open sea.

1.5.2.97 Lamprey species are considered to have significantly reduced sensitivity to EMF from subsea electrical cabling in comparison with fish species, such as elasmobranchs, and should effects occur, these would be limited to within a few metres of the buried cable and migration will not be significantly affected. In addition, considering the mitigation

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measure outlined in Table 1.20 which will ensure that inter-array and interconnector cables will be buried to depths of at least 0.5 m as informed by a CBRA, no significant adverse effects to lamprey are predicted. While burial of cables will not reduce the strength of EMF from subsea electric cables, it does increase the distance between cables and Annex II diadromous fish features, thereby reducing the effect on those receptors.

- 1.5.2.98 Any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region, will be reversible on decommissioning of the cable and will not result in any barriers to migration to and from the SAC. Any behavioural effects will be further minimised by the burial of cables (see Table 1.20).
- 1.5.2.99 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that for prey species of the sea lamprey and river lamprey (herring and sprat) impacts from EMF would be of minor adverse significance, which is not significant in EIA terms. The abundance of prey species forming the food source of river lamprey/sea lamprey will not be significantly affected by EMF effects.
- 1.5.2.100 There is also no pathway for EMF to result in adverse effects on the habitats of the qualifying species or the water quality of the rivers.

Conclusions

- 1.5.2.101 It is concluded that no adverse effects on sea lamprey and river lamprey which could undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraphs 1.5.1.16 to 1.5.1.18) is presented in Table 1.22. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.22: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality.	There is no impact pathway from EMF to affect water quality or to physically obstruct a migratory pathway. As such, Therefore, the migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will remain unobstructed by physical barriers and/or poor water quality
The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000).	Given that lamprey species are considered to have low sensitivity to EMF effects and that the assessment concluded EMF impacts would not result in a barrier to migration of the qualifying diadromous fish species, the population or distributions of the qualifying species will not be prevented from being maintained or restored.

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Conservation Objective	Conclusion
The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.	Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that for prey species of the sea lamprey and river lamprey (herring and sprat) impacts from EMF would be of minor adverse significance, which is not significant in EIA terms. The impact will be localised and reversible on decommissioning of the cables. The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary will be maintained.

1.5.2.102 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Dee Estuary/Aber Dyfrdwy SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

River Derwent and Bassenthwaite Lake SAC

Sea lamprey and river lamprey

1.5.2.103 Potential EMF from subsea electrical cabling and impacts on sea lamprey and river lamprey features of the River Derwent and Bassenthwaite Lake SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Generation Assets) outlined in paragraph 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.95 to 1.5.2.98, any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While lamprey species are known to be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.104 In addition, as the River Derwent and Bassenthwaite Lake SAC (71.2 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC, it is considered that impacts on the lamprey features of this site would be of similar if not of a lower magnitude. Due to the location of the Derwent and Bassenthwaite Lake SAC in respect to the Morgan Generation Assets, it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.23. As such, no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the Derwent and Bassenthwaite Lake SAC.

Atlantic salmon

1.5.2.105 Potential impacts from EMF from subsea electrical cabling on the Atlantic salmon feature of the River Derwent and Bassenthwaite Lake SAC are predicted as outlined in paragraphs 1.5.2.87 to 1.5.2.91. As described in paragraphs 1.5.2.89 to 1.5.2.91, any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While Atlantic salmon may be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

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1.5.2.106 In addition, as the River Derwent and Bassenthwaite Lake SAC is located a considerable distance (71.2 km) from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Due to the location of the Derwent and Bassenthwaite Lake SAC relative to the Morgan Generation Assets, EMF is unlikely to present a barrier to migration. With reference to the conservation objectives for the SAC no Adverse Effect on Integrity is concluded for the Atlantic salmon feature of the River Derwent and Bassenthwaite Lake SAC.

Conclusions

1.5.2.107 It is concluded that no adverse effects on sea lamprey, river lamprey and Atlantic salmon which undermine the conservation objectives of the River Derwent and Bassenthwaite Lake SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraphs 1.5.1.24 to 1.5.1.25) is presented in Table 1.23. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.23: Conclusions against the conservation objectives of the River Derwent and Bassenthwaite Lake SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are restored	There is no pathway for effect between EMF from subsea electrical cabling and the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being restored.
The structure and function of the habitats of qualifying species are restored	
The supporting processes on which the habitats of qualifying species rely are restored	
The populations of qualifying species are restored	
The distributions of qualifying species within the site are restored	
	Given that Atlantic salmon and lamprey species are considered to have low sensitivity to EMF from subsea electrical cabling and that any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon, sea lamprey and river lamprey. For these reasons and given the distance of the SAC from the Morgan Generation Assets (71.2 km) the populations and distributions of Atlantic salmon, sea lamprey and river lamprey will not be prevented from being maintained or restored.

1.5.2.108 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Derwent and Bassenthwaite Lake SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

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River Kent SAC

Freshwater pearl mussel

- 1.5.2.109 This site is only designated for freshwater pearl mussel with sea trout thought to be the host species within the River Kent SAC, however Atlantic salmon are also present within the river (Natural England, 2018d), and the site was therefore screened in on a precautionary basis.
- 1.5.2.110 For the SACs outlined above, where Atlantic salmon is a qualifying feature, no adverse effects have been concluded in relation to EMF from subsea electric cables. Potential impacts from EMF from subsea electrical cabling on sea trout and Atlantic salmon features of the River Kent SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.89 to 1.5.2.91, any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While Atlantic salmon may be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.
- 1.5.2.111 In addition, as the River Kent SAC (80.9 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the River Ehen SAC, it is considered that impacts would be of similar if not of a lower magnitude. Due to the location of the River Kent relative to the Morgan Generation Assets EMF is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. With reference to the conservation objectives for the SAC no Adverse Effect on Integrity is concluded for the Atlantic salmon features of the SACs outlined above, and for those which utilise the River Kent SAC. Therefore, it can also be concluded that there will be no indirect adverse effects to the freshwater pearl mussel.

Conclusions

- 1.5.2.112 It is concluded that no adverse effects on freshwater pearl mussel which undermine the conservation objectives of the River Kent SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraphs 1.5.1.29 to 1.5.1.30) is presented in Table 1.24. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.24: Conclusions against the conservation objectives of the River Kent SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are maintained or restored	There is no pathway for effect between EMF from subsea electrical cabling and the habitats of freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.
The structure and function of the habitats of qualifying species are maintained or restored	
The supporting processes on which the habitats of qualifying species rely are maintained or restored	

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Conservation Objective	Conclusion
The populations of qualifying species are maintained or restored	Atlantic salmon and sea trout are thought to be the host species for freshwater pearl mussel within the SAC. EMF from subsea electrical cabling will not impact sea trout as the species is purely freshwater and does not migrate into the marine environment. Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electrical cabling and that the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon, the population and distribution of freshwater pearl mussel within the site will not be prevented from being maintained or restored.
The distributions of qualifying species within the site are maintained or restored	

1.5.2.113 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Kent SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

Solway Firth SAC

Sea lamprey and river lamprey

1.5.2.114 Potential EMF from subsea electrical cabling impacts on sea lamprey and river lamprey features of the Solway Firth SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan Generation Assets) outlined in paragraph 1.5.2.95 to 1.5.2.98. As the Solway Firth SAC (84.7 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC, it is considered that impacts on the lamprey features of this site would be of similar if not of a lower magnitude. As described in paragraphs 1.5.2.95 to 1.5.2.98, any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While lamprey species are known to be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.115 In addition, due to the location of the Solway Firth SAC in respect to the Morgan Generation Assets, it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. although specific consideration of conservation objectives for this SAC are presented in Table 1.25. As such, no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the Solway Firth SAC.

Conclusions

1.5.2.116 It is concluded that no adverse effects on sea lamprey and river lamprey which undermine the conservation objectives of the Solway Firth SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraphs underwater sound' against each relevant conservation objective (as presented in paragraph 1.5.1.35 to

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1.5.1.36) is presented in Table 1.25. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.25: Conclusions against the conservation objectives of the Solway Firth SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are restored	There is no pathway for effect between EMF from subsea electrical cabling and the habitats of sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being restored.
The structure and function of the habitats of qualifying species are restored	
The supporting processes on which the habitats of qualifying species rely are restored	
The populations of qualifying species are restored	Given that lamprey species are considered to have low sensitivity to EMF from subsea electrical cabling and that any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of sea lamprey and river lamprey. For these reasons and given the distance of the SAC from the Morgan Generation Assets (84.7 km) the populations and distributions of sea lamprey and river lamprey will not be prevented from being maintained or restored.
The distributions of qualifying species within the site are restored	

1.5.2.117 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Solway Firth SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

River Bladnoch SAC

Atlantic salmon

1.5.2.118 Potential impacts from EMF from subsea electrical cabling on Atlantic salmon features of the River Bladnoch SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.89 to 1.5.2.91, any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While Atlantic salmon may be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.119 In addition, as the River Bladnoch SAC (89.8 km from the Morgan Generation Assets) is located at a considerable distance from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Due to the location of the River Bladnoch SAC relative

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to the Morgan Generation Assets, EMF is unlikely to present a barrier to migration. With reference to the conservation objectives of the SAC, no Adverse Effect on Integrity was concluded on the Atlantic salmon feature of the River Bladnoch SAC.

Conclusions

1.5.2.120 It is concluded that no adverse effects on Atlantic salmon which undermine the conservation objectives of the River Bladnoch SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraph 1.5.1.40) is presented in Table 1.26. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.26: Conclusions against the conservation objectives of the River Bladnoch SAC from EMF from subsea electrical cabling during the operation and maintenance phase.

Conservation Objective	Conclusion
Restore the population of the species, including range of genetic types, as a viable component of the site	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electrical cabling and that the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon, the population of Atlantic salmon (including range of genetic types) within the site will not be prevented from being restored as a viable component within the site. In addition, as the River Bladnoch SAC (89.8 km from the Morgan Generation Assets) is located at a considerable distance from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Therefore, EMF from subsea electrical cabling associated with Morgan Generation Assets will not prevent the distribution of Atlantic salmon within the site from being restored.
Restore the distribution of the species throughout the site	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electrical cabling and that the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon, the population of Atlantic salmon (including range of genetic types) within the site will not be prevented from being restored as a viable component within the site. In addition, as the River Bladnoch SAC (89.8 km from the Morgan Generation Assets) is located at a considerable distance from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Therefore, EMF from subsea electrical cabling associated with Morgan Generation Assets will not prevent the distribution of Atlantic salmon within the site from being restored.
Restore the habitats supporting the species within the site and availability of food	There is no pathway between EMF from subsea electrical cabling and the habitats of Atlantic salmon. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the habitats supporting Atlantic salmon within the site and availability of food from being restored.

1.5.2.121 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Bladnoch SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance of the Morgan Generation Assets alone.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

Sea lamprey and river lamprey

1.5.2.122 Potential EMF from subsea electrical cabling impacts on sea lamprey and river lamprey features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan Generation Assets) as outlined in paragraphs 1.5.2.95 to

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1.5.2.97. As described in paragraphs 1.5.2.95 to 1.5.2.98, any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While lamprey species are known to be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.123 In addition, as the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (92.4 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC, it is considered that impacts on the lamprey features of this site would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.27. As such, no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC.

Atlantic salmon

1.5.2.124 Potential impacts from EMF from subsea electrical cabling on Atlantic salmon features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.89 to 1.5.2.91, any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While Atlantic salmon may be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.125 In addition, as the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (92.4 km from the Morgan Generation Assets) is located at a considerable distance from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Due to the location of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC relative to the Morgan Generation Assets, EMF is unlikely to present a barrier to migration. With reference to the conservation objectives for the SAC no Adverse Effect on Integrity is concluded for the Atlantic salmon feature of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC.

Conclusions

1.5.2.126 It is concluded that no adverse effects on sea lamprey, river lamprey and Atlantic salmon which undermine the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraphs 1.5.1.47 to 1.5.1.48) is presented in Table 1.27. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.27: Conclusions against the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The parameters defined in the vision for the watercourse as outlined in NRW (2022b) must be met	Due to the nature of the potential impact, and the distance of the Morgan Array Area from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (92.4 km), there is no route to potential impact and EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the defined vision for the watercourse from being met. There will be no reduction in the area or quality of habitat for the populations of Atlantic salmon, sea lamprey and river lamprey of in the SAC on a long-term basis.
There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis	
The SAC feature populations will be stable or increasing over the long term	
The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future	
All factors affecting the achievement of these conditions are under control.	
	Given that Atlantic salmon and lamprey species are considered to have low sensitivity to EMF from subsea electrical cabling and that the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon, sea lamprey and river lamprey, the populations of Atlantic salmon, sea lamprey and river lamprey will not be prevented from remaining stable or increasing in the long term and the natural ranges of Atlantic salmon, sea lamprey and river lamprey will neither be reduced or likely be reduced in the foreseeable future.
	Given EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the defined vision for the watercourse from being met, nor will it reduce the area or quality of habitat for Atlantic salmon, sea lamprey and river lamprey populations, and as the EMFs will not result in a barrier to these migratory fish, or reduce their natural ranges, it is considered that all factors affecting the achievement of these conditions will remain.

1.5.2.127 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

Afon Gwyrfai a Llyn Cwellyn SAC

Atlantic salmon

1.5.2.128 Potential impacts from EMF from subsea electrical cabling on Atlantic salmon features of the River Bladnoch SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.89 to 1.5.2.91, any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While Atlantic salmon may be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.129 In addition, as the Afon Gwyrfai a Llyn Cwellyn SAC (117.9 km from the Morgan Generation Assets) is located at a considerable distance from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Due to the location of the Afon Gwyrfai a Llyn Cwellyn SAC relative to the Morgan Generation Assets, EMF is unlikely to present a

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barrier to migration. With reference to the conservation objectives for the SAC no Adverse Effect on Integrity is concluded for the Atlantic salmon feature of as the Afon Gwyrfaï a Llyn Cwellyn SAC.

Conclusions

1.5.2.130 It is concluded that no adverse effects on Atlantic salmon which undermine the conservation objectives of the Afon Gwyrfaï a Llyn Cwellyn SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraph 1.5.1.47 to 1.5.1.48) is presented in Table 1.28. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.28: Conclusions against the conservation objectives of the Afon Gwyrfaï a Llyn Cwellyn SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The conservation objective for the water course as outlined in NRW (2022c) must be met	Considering the distance from the Morgan Generation Assets to the Afon Gwyrfaï a Llyn Cwellyn SAC (117.9 km) and the nature of the potential impact, there is no pathway for effect between EMF from subsea electrical cabling and the watercourse. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the conservation objectives for the water course from being met.
The population of the feature in the SAC is stable or increasing over the long term	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electrical cabling and that the assessment concluded that EMF from subsea electrical cabling associated with Morgan Generation Assets would not result in a barrier to migration of Atlantic salmon, the population of Atlantic salmon will not be prevented from remaining stable or increasing in the long term and the natural range of Atlantic salmon will neither be reduced or likely be reduced in the foreseeable future.
The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future	
The Gwyrfaï will continue to be a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis	There is no pathway for effect between EMF from subsea electrical cabling and the habitats of the qualifying species. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not reduce the area of the habitats of Atlantic salmon and the Gwyrfaï will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the SAC on a long-term basis.

1.5.2.131 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Afon Gwyrfaï a Llyn Cwellyn SAC as a result of EMF from subsea electrical cabling with respect to operations and maintenance of the Morgan Generation Assets alone.

River Eden SAC

Sea lamprey and river lamprey

1.5.2.132 Potential EMF from subsea electrical cabling impacts on sea lamprey and river lamprey features of the River Eden SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (70.1 km from the Morgan Generation Assets) outlined in paragraph 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.95 to

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1.5.2.98, any impact of EMF from subsea electrical cabling will be localised in the context of the wider Irish Sea region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While lamprey species are known to be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.133 In addition, as the River Eden SAC (125.6 km from the Morgan Generation Assets) is located at an increased distance from the Morgan Generation Assets than the Dee Estuary/Aber Dyfrdwy SAC, it is considered that impacts on lamprey features of this site would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable although specific consideration of conservation objectives for this SAC are presented in Table 1.29. As such, no Adverse Effect on Integrity was concluded for the sea lamprey and river lamprey features of the River Eden SAC.

Atlantic salmon

1.5.2.134 Potential impacts from EMF from subsea electrical cabling on Atlantic salmon features of the River Eden SAC are predicted to be similar to those associated with the River Ehen SAC (62.5 km from the Morgan Generation Assets) outlined in paragraphs 1.5.2.95 to 1.5.2.98. As described in paragraphs 1.5.2.89 to 1.5.2.91, any impact of EMF from subsea electrical cabling will be localised in context with the wider Irish Sea region region (i.e. any behavioural effects, should they occur, would be limited to within a few metres of the cable), and will not result in any barriers to migration to and from the SAC. While Atlantic salmon may be able to detect EMFs from subsea cables any effects would be limited and temporary and migration will not be significantly affected.

1.5.2.135 In addition, as the River Eden SAC (125.6 km from the Morgan Generation Assets) is located at a considerable distance from the Morgan Generation Assets, it is considered that impacts on the Atlantic salmon feature of this site would be inconsequential in magnitude. Due to the location of the River Eden SAC relative to the Morgan Generation Assets, EMF is unlikely to present a barrier to migration. With reference to the conservation objectives for the SAC no Adverse Effect on Integrity is concluded for the Atlantic salmon feature of the River Eden SAC.

Conclusions

1.5.2.136 It is concluded that no adverse effects on sea lamprey, river lamprey and Atlantic salmon which undermine the conservation objectives of the River Eden SAC will occur as a result of EMF from subsea electrical cabling during the operations and maintenance phase. An assessment of the potential impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraphs 1.5.1.58 to 1.5.1.59) is presented in Table 1.29. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.29: Conclusions against the conservation objectives of the River Eden SAC from EMF from subsea electrical cabling during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of habitats of qualifying species are restored	There is no pathway for effect between EMF from subsea electrical cabling and the habitats of Atlantic salmon, sea

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Conservation Objective	Conclusion
The structure and function of the habitats of qualifying species are restored	lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being restored.
The supporting processes on which the habitats of qualifying species rely are restored	
The populations of qualifying species are restored	
The distributions of qualifying species within the site are restored	

1.5.2.137 Therefore, it can be concluded beyond reasonable scientific doubt that there **is no risk of an adverse effect on the integrity** of the River Eden SAC as a result of EMF from subsea electrical cabling with respect to the operations and maintenance phase of the Morgan Generation Assets alone.

1.5.3 Assessment of adverse effects in-combination with other plans and projects

1.5.3.1 The other developments (projects/plans) that could result in in-combination effects associated with the Morgan Generations Assets on Annex II diadromous fish features of the designated sites identified have been summarised in Table 1.30 and shown in Figure 1.4.

1.5.3.2 As outlined in the HRA Stage 1 Screening Report (Document Reference E1.4), where the potential for LSE has been concluded with respect to the Morgan Generation Assets alone, the potential for LSE also has been concluded in-combination. For potential impacts where LSE has been ruled out with respect to the Morgan Generation Assets alone, there is either no pathway to effect, or the Morgan Generation Assets would result in only negligible or inconsequential effects that would not contribute (even collectively) or materially to in-combination effects and therefore, no additional potential impacts are taken forward to the in-combination assessment.

1.5.3.3 On this basis, the potential impacts identified for assessment as part of Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3), and which have been brought forward for consideration in the in-combination assessment of the HRA Stage 2 ISAA Part 2 – SAC assessments are:

- In-combination underwater sound
- In-combination EMF from subsea electric cables.

1.5.3.4 The following assessments of the effects of the Morgan Generation Assets, acting in-combination with other relevant plans and projects, on Annex II diadromous fish have been informed by the detailed project-specific underwater sound modelling presented in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental

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Statement (Document Reference F3.3.1) and the technical assessments presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). The Applicant has made all reasonable efforts to ensure that the information included in the assessments relating to other plans and projects is correct and sufficiently detailed, with any limitations on the information available acknowledged. The assessments have also drawn upon the sensitivity assessments of the relevant fish species detailed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on European site integrity from the Morgan Generation Assets in-combination with other plans and projects have been identified in light of the best available scientific knowledge. and all reasonable scientific doubt can be ruled out.

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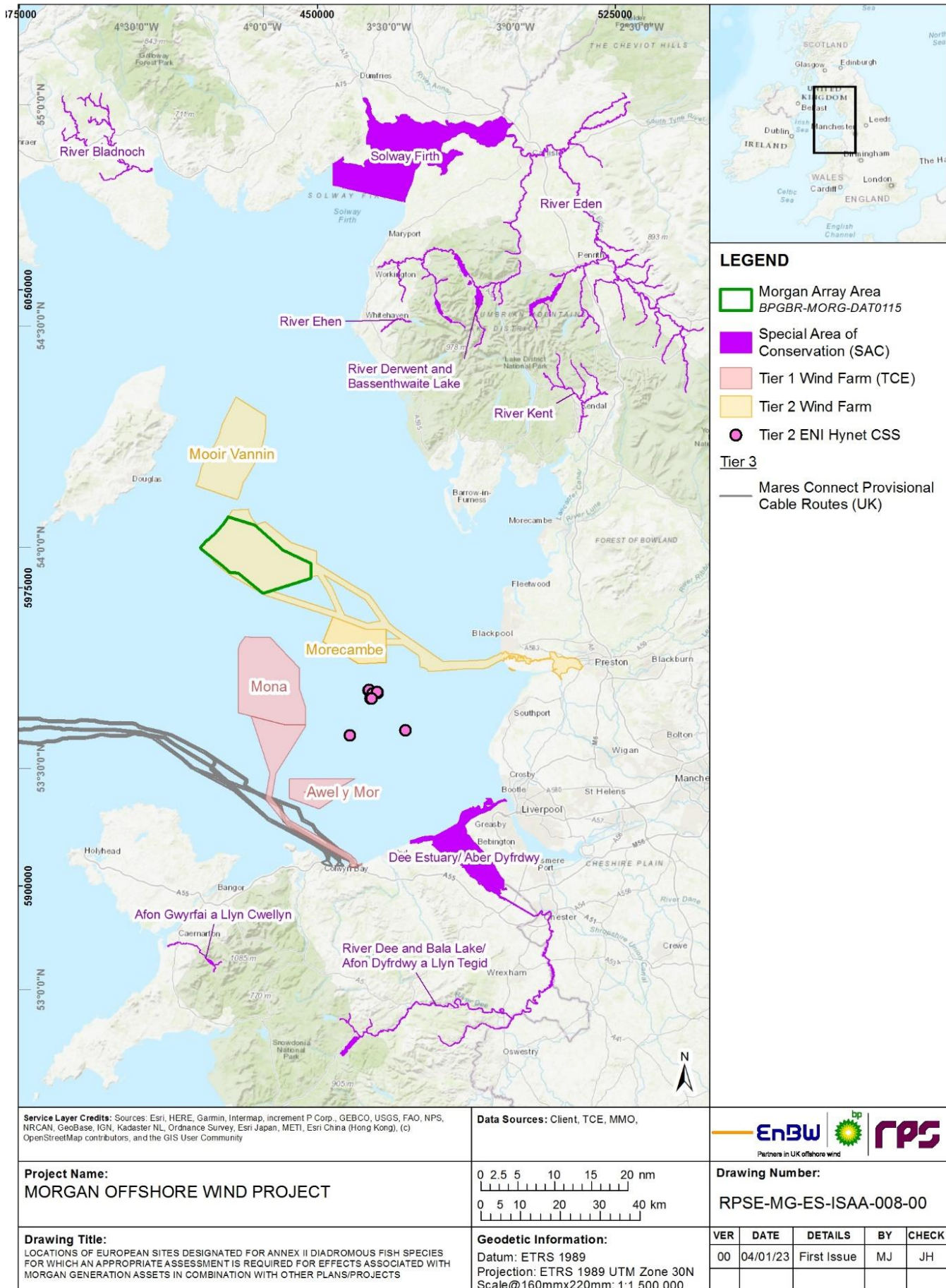


Figure 1.4: Locations of other projects and plans considered for in-combination effects on SACs with Annex II diadromous fish features

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Table 1.30: List of other projects and plans with potential for in-combination effects on Annex II diadromous fish features.

Project/plan	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
Tier 1						
Offshore renewables						
Awel y Môr Offshore Wind Farm	Consented	46.8	Offshore wind farm	2026 to 2030	2030 to 2055	The construction, operations and maintenance and decommissioning phases of this project will overlap with the construction and operations and maintenance of the Morgan Generation Assets.
Mona Offshore Wind Project	Application submitted	5.5	Offshore wind farm	2028 to 2029	2030 to 2065	The construction, operations and maintenance and decommissioning phases of this project will overlap with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets.
Tier 2						
Offshore Renewables Projects						
Morecambe Offshore Windfarm: Generation Assets	Pre-application	11.2	Offshore wind farm	2026 to 2028	2029 to 2065	The construction, operations and maintenance phases of this project will overlap with the construction, operations and maintenance and decommissioning phases of the Morgan Generation Assets.

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Project/plan	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
Moor Vannin Offshore Windfarm	Pre-application	34.5	Offshore wind farm	2030 to 2032	Operational in 2032 with end date unknown	The construction, operations and maintenance phase of this project is anticipated to overlap with the operation and maintenance phase of the Morgan Generation Assets.

Cables and pipelines

Morgan and Morecambe Offshore Wind Farms: Transmission Assets	Pre-application	11.2	Morgan and Morecambe Offshore Wind Farms: Transmission Assets	2026 to 2028	2029 to 2064	Project construction and operation and maintenance phase overlaps with Morgan Generation Assets construction phase.
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Oil and gas

ENI HyNet Carbon Capture and Storage (CCS)	Pre-application	31.1	CCS project in the east Irish Sea. Works will include installation of a new Douglas CCS platform and work on the existing Hamilton, Hamilton North and Lennox wellhead platforms.	Unknown	Unknown	This project will overlap with the construction and operations and maintenance phases of the Morgan Generation Assets.
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Tier 3

Cables and pipelines

MaresConnect – Wales-Ireland Interconnector Cable	Permitted but not yet implemented	48.2	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	n/a	n/a	This project will overlap with the construction and operations and maintenance phases of the Morgan Generation Assets.
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In-combination underwater sound impacting fish and shellfish receptors

- 1.5.3.5 There is potential for impacts from underwater sound as a result of activities associated with the Morgan Generation Assets during construction, in-combination with activities associated with the projects/plans outlined in Table 1.30.
- 1.5.3.6 As for the assessment of the Morgan Generation Assets alone, the risk of injury in terms of PTS to most of the diadromous fish receptors, as a result of underwater sound, would be expected to be localised to within the boundaries of the respective projects. It is also anticipated that standard offshore wind industry construction methods (which include soft starts and visual and acoustic monitoring of marine mammals as standard) will be applied for all projects, thereby reducing the magnitude of the potential impact with respect to auditory injury occurring in diadromous fish. Therefore, there is very low potential for significant in-combination effects for injury from elevated underwater sound during piling and the in-combination assessment presented below focuses on disturbance only.
- 1.5.3.7 The in-combination effects assessment has followed the methodology set out in Volume 1, Chapter 5: EIA methodology of the Environmental Statement. The assessment considered the impact of disturbance from underwater sound during piling under the following in-combination scenarios (see section 1.4.5, paragraphs 1.4.5.5 to 1.4.5.9):
- Scenario 1: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets
 - Scenario 2: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm Generation Assets
 - Scenario 3: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside all other projects, plans and activities. This assessment has been allocated into ‘tiers’ reflecting the current stage of the other projects, plans and activities within the planning and development process. This tiered approach is adopted to provide a clear assessment of the Morgan Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside other projects, plans and activities.

Construction Phase

Scenario 1

- 1.5.3.8 Scenario 1 represents the installation of 454 x pin piles at Morgan Generation Assets with a maximum hammer energy of up to 4,400 kJ, and installation of six monopiles at the Transmission Assets with a maximum hammer energy of 5,500 kJ. The Transmission Assets is likely to represent only a minor and very short-term contribution to the cumulative underwater sound levels. Further, the cumulative effect is predicted to be of regional spatial extent and be of short-term duration. The effect is likely to be intermittent and of high reversibility.

Scenario 2

- 1.5.3.9 Scenario 2 represents Scenario 1, plus the addition of Morecambe Generation Assets, which is based upon a maximum hammer energy is of 5,000 kJ for the installation of 42 monopiles. Since the impact of underwater sound is likely to be short-term duration

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and intermittent and considering the distance from the Morgan Generation Assets (11.2 km), the cumulative effect is considered to be the same as for Scenario 1.

Scenario 3

1.5.3.10 Scenario 3 represents Scenario 1 and 2, plus the addition of the following Tiers:

Tier 1

- 1.5.3.11 The construction phases of the Awel y Môr Offshore Wind Farm, and Mona Offshore Wind Project, will temporally overlap with the Morgan Generation Assets in terms of construction sound (particularly during piling and UXO clearance), potentially resulting in in-combination effects. The assessment of potential sound impacts associated with the Morgan Generation Assets alone have been presented from paragraph 1.5.2.2.
- 1.5.3.12 For Awel y Môr, a maximum hammer energy of 5,000 kJ is planned for installation of up to 50 monopiles over a maximum 74 day period (single vessel), with a maximum duration of 896 hours of piling expected.
- 1.5.3.13 Sound modelling undertaken for the Awel y Môr project indicated similar patterns as those for the Morgan Generation Assets, with injury and mortality from sound produced within the Awel y Môr Array Area to ranges of up to 2,000 m for group 1 fish if modelled as static receptors (RWE, 2022a), and <100 m for moving group 1 fish. In all cases, modelling the fish as receptors moving away from a sound source highly significantly reduced mortality distances. TTS ranges distances were calculated to reach out to up to 17,000 m for group 1 moving receptors, or up to 36,000 m for static receptors. This was also the case for group 2 fish.
- 1.5.3.14 As with the Morgan Generation Assets, measures including soft starts will reduce the risk of injury and mortality to fish receptors. With respect to behavioural effects the Awel y Môr project indicated behavioural effects to similar ranges as those predicted for the Morgan Generation Assets, with behavioural effects expected to a range of approximately up to tens of kilometres from the piling location at the maximum hammer energies. Diadromous fish species were not examined separately for the Awel y Môr Offshore Wind Farm, but evidence did indicate that for fish motivated by strong biological drivers, such as diadromous fish on their spawning migrations, the effect was not significant.
- 1.5.3.15 For Mona Offshore Wind Project, piling will take place over 113.5 days (single piling) to install 454 pin piles (265 for 64 x four-legged wind turbine foundation jackets, 150 for 10 x gravity base foundations, 48 for four x four-legged jacket OSPs), with a maximum hammer energy of 4,400 kJ. Piling will be undertaken over two years over a four-year construction phase.
- 1.5.3.16 Sound modelling for Mona Offshore Wind Project shows injury and mortality to ranges of up to 556 m for group 1 fish, and 3,180 m for group 2, fish, as static receptors. Ranges are much lower for moving receptors. Behavioural effects are expected to a range of up to tens of kilometres from the source. However, based on the studies summarised within the Morgan, and Mona, Environmental Statements (Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3 for each project), behavioural effects on fish species could be expected within the 160 dB re 1 μ Pa SPL_{pk} contours. Sound contours in the Morgan, and Mona, Environmental Statements (Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3 for each project) indicated that these contours did not extend to the coast of England or Wales, and, as

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such, would not represent a barrier to migration for those fish moving through the Irish Sea to/from the relevant SACs (Morgan Offshore Wind Ltd, 2023).

- 1.5.3.17 When considered in-combination with the Morgan Generation Assets, Tier 1 projects amount to up to 301 days of piling over construction phases of several years (i.e. four years for Morgan, three years for Awel y Môr, and four years for Mona). As such, there is minimal risk of disruption to migration of lamprey species or Atlantic salmon, as potential sound impacts will be short term and intermittent in nature during the construction phases.

Tier 2

- 1.5.3.18 The construction phase of the Morecambe Offshore Wind Farm, may have temporal overlap with the Morgan Generation Assets in terms of construction sound, with potential to result in in-combination effects.

- 1.5.3.19 Morecambe Generation Assets will involve piling with a maximum hammer energy of 5,000 kJ to install up to 42 monopiles (40 x wind turbine foundations and 2 x OSP foundations) or 168 pin piles (based on four pin piles at each of 42 jacket foundations). A maximum of 756 hours of piling is expected based on the piling scenario. Piling of foundations will be undertaken within a construction phase of 2.5 years. For the Morecambe Offshore Windfarm: Generation Assets, sound modelling indicated similar patterns as those for the Morgan Generation Assets, with injury and mortality from sound produced within the Morecambe Offshore Windfarm: Generation Assets for a single monopile (maximum hammer energy of 5,000 kJ to ranges of up to 830 m for group 1 fish, 2,900 m for group 2 fish, if modelled as static receptors (Morecambe Offshore Windfarm Ltd., 2023). Injury distances were calculated to reach out to up to 6,700 m for group 2 static receptors with similar patterns for all other groups of fish. For the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, piling will take place over 6 days (single piling) to install 6 monopiles (4 m x 16 m diameter monopiles at Morgan Offshore Wind Project and 2 m x 14 m monopiles at Morecambe Offshore Wind Project), with a maximum hammer energy of 5,500 kJ. A maximum of 44 hours of piling is expected under this scenario, although it should be noted that the OSPs considered for the Transmission Assets are also included within the Morgan Generation Assets assessment, therefore the overlap here is somewhat overestimated. Piling will be undertaken over two years within a four-year construction phase. Sound modelling has indicated similar patterns to the Morgan Generation Assets, wherein SPL_{pk} when piling energy is at its maximum (i.e. 5,500 kJ) has been modelled to cause mortality and recoverable injury to fish within a maximum of 648 m of the piling activity. When fish are modelled as moving receptors, the mortality injury ranges are considerably smaller than those predicted for SPL_{pk} , in that the mortality thresholds were exceeded only for fish eggs and larvae, within a range of up to 2.02 km. When fish were modelled as static receptors, mortality and recoverable injury ranges were significantly higher than for both SPL_{pk} and SEL_{cum} when fish are modelled as receptors moving away from the source, with a maximum mortality range of up to 755 m for group 1 fish and 2 km for group 2 fish, whilst the recoverable injury range was up to 4.34 km for group 2 fish.

- 1.5.3.20 When considered in-combination with the Morgan Generation Assets, Tier 2 projects could amount to up to 172 days of piling over construction phases of several years (i.e. four years for Morgan, 2.5 years for Morecambe Generation Assets, and two years for the Transmission Assets).

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Tier 3

- 1.5.3.21 No Tier 3 projects are predicted to interact in-combination with the Morgan Generation Assets for this impact.
- 1.5.3.22 The various projects create a larger area of ensonification with a higher potential for behavioural effects upon diadromous fish. However, these behavioural effects, which could lead to a barrier to migration through avoidance behaviour of the ensonified area, only have the potential to occur during fish migration and group 1 and 2 fish are less sensitive to underwater sound than group 3 and 4 fish. Further, as piling will be intermittent and relatively short term and not occurring continuously throughout the construction phase, and all projects are likely to implement mitigation measures such as soft starts, the overall potential impact from changes in underwater sound during the construction of the plan/projects will have a negligible impact on Annex II diadromous fish species. Potential effects from this impact on the relevant conservation objectives of SACs are discussed in turn below.

The River Ehen SAC

- 1.5.3.23 Any potential in-combination effects on the Atlantic salmon and freshwater pearl mussel features of the River Ehen SAC are predicted to be relatively short-term in duration and intermittent. Diadromous fish species are assessed as having low sensitivity to sound (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). In addition, despite the increase in the frequency of effect, the ranges of impact for Annex II diadromous fish do not significantly increase. As such, cumulative effects from in-combination underwater sound will not present a barrier to migration for these species. In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will further reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.24 It is concluded that no adverse effects on the qualifying features of the River Ehen SAC which could undermine the conservation objectives of the site will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact of 'underwater sound in-combination' against each relevant conservation objective (as presented in paragraphs 1.5.1.9) is discussed in Table 1.31.
- 1.5.3.25 Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.31: Conclusions against the conservation objectives of the River Ehen SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>The Morgan Generation Assets will involve single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is predicted up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to cumulative under water sound levels.</p> <p>There is no pathway for in-combination underwater sound to result in adverse effects on the habitats of the Atlantic salmon and freshwater pearl mussel during the construction phase. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon and freshwater pearl mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being restored.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>As with Scenario 1, there is no pathway for in-combination underwater sound to result in adverse effects on the habitats of the Atlantic salmon and freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon and freshwater pearl mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
			<p>here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>As with Scenario 1 and 2, there is no pathway for in-combination underwater sound to result in adverse effects on the habitats of the Atlantic salmon and freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets, Tier 1 projects and Tier 2 Morecambe Generation Assets and ENI HyNey CCS projects will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon and freshwater pearl</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
			<p>mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being maintained or restored.</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p>
<p>The populations of qualifying species are restored</p> <p>The distributions of qualifying species within the site are restored</p>	<p>The Morgan Generation Assets will involve single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be of relatively short term duration and intermittent with the soundscape returning to near baseline conditions upon completion of construction. Both projects will implement mitigation measures such as soft starts which are expected to allow some reactive fish species to move away from the sound, and diadromous fish features are expected to have relatively low sensitivity to the effects of underwater sound. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the populations and distributions of Atlantic salmon and freshwater pearl mussel within the site from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>with the Morgan Generation Assets in-combination with other plans/projects will not prevent the populations and distributions of Atlantic salmon and freshwater pearl mussel within the site from being restored.</p>		<p>m for group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the populations and distributions of Atlantic salmon and freshwater pearl mussel within the site from being maintained or restored.</p>

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- 1.5.3.26 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Ehen SAC as a result of underwater sound impacts with respect to the construction of the Morgan Generation Assets in-combination with other plans/projects.

Dee Estuary/Aber Dyfrdwy SAC

- 1.5.3.27 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.28 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.16 and 1.5.1.18) is discussed in Table 1.32. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.32: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC for in-combination underwater sound during the construction phase.

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality.</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets in-combination with the Transmission Assets.</p> <p>There is no impact pathway for in-combination underwater sound to affect water quality or cause a physical obstruction to the migratory passage of the designated features. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish).</p> <p>Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>As for Scenario 1, there is no impact pathway for in-combination underwater sound to affect water quality or cause a physical obstruction to the migratory passage of the designated features. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan</p>

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Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>As for Scenarios 1 and 2, there is no impact pathway for in-combination underwater sound to affect water quality or cause a physical obstruction to the migratory passage of the designated features. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000).</p>	<p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. Therefore, the Morgan Generation Assets in-combination with the Transmission Assets will not result in the reduction of sea lamprey or river lamprey populations.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Wind Farm Generation Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. Therefore, the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not result in the reduction of sea lamprey or river lamprey populations.</p>	<p>Dee will therefore remain unobstructed by physical barriers and/or poor water quality.</p> <p>Tier 1 Awel y Môr Offshore Wind Farm: Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project: Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2 Morecambe Generation Assets: Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m fo group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morcambe Transmission Assets: Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and</p>

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Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. Therefore, the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not result in the</p>

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Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.</p>	<p>Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that underwater sound resulting from the Morgan Generation Assets In-combination with the Transmission Assets would be short term, intermittent in nature, and a relatively small proportion of spawning habitats would be affected at any one time. Underwater sound associated with in-combination with other projects will also be intermittent, with all projects will also implementing mitigation measures such as soft starts. Therefore, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that underwater sound resulting from the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets would be short term, intermittent in nature, and a relatively small proportion of spawning habitats would be affected at any one time. Underwater sound associated with in-combination with other projects will also be intermittent, with all projects will also implementing mitigation measures such as soft starts. Therefore, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.</p>	<p>reduction of sea lamprey or river lamprey populations.</p> <p>Tier 1 Awel y Môr Offshore Wind Farm: Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project: Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2 Morecambe Generation Assets: Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m fo group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morcambe Transmission Assets: Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and</p>

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Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that underwater sound resulting from the Morgan Generation Assets would be short term, intermittent in nature, and a relatively small proportion of spawning habitats would be affected at any one time. Underwater sound associated with in-combination with other projects will also be intermittent, with all projects will also implementing mitigation</p>

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Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			measures such as soft starts. Therefore, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.

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- 1.5.3.29 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Dee Estuary/Aber Dyfrdwy SAC as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

River Derwent and Bassenthwaite Lake SAC

- 1.5.3.30 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.31 It is concluded that no adverse effects on the qualifying features which undermine the conservation objectives of the River Derwent and Bassenthwaite Lake SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.19 to 1.5.1.25) is discussed in Table 1.33. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.33: Conclusions against the conservation objectives of the River Derwent and Bassenthwaite Lake SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are restored</p> <p>The structure and function of the habitats of qualifying species are restored</p> <p>The supporting processes on which the habitats of qualifying species rely are restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morecambe Transmission Assets:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.
<p>The populations of qualifying species are restored</p> <p>The distributions of qualifying species within the site are restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
	<p>prevent the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site from being maintained or restored.</p>	<p>with the Transmission Assets and the Morecambe Generation Assets will not prevent the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site from being maintained or restored</p>	<p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensounded area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site from being maintained or restored.</p>

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1.5.3.32 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Derwent and Bassenthwaite Lake SAC as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

River Kent SAC

1.5.3.33 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

1.5.3.34 It is concluded that no adverse effects on the qualifying features which undermine the conservation objectives of the River Kent SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.29 to 1.5.1.30) is discussed Table 1.34. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.34: Conclusions against the conservation objectives of the River Kent SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained/restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for in-combination underwater sound to result in adverse effects on the habitats of the freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for in-combination underwater sound to result in adverse effects on the habitats of the freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>m for group 1 fish and 6,700 m for group 2 fish, if fish are static.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for in-combination underwater sound to result in adverse effects on the habitats of the freshwater pearl mussel. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained/restored</p> <p>The distributions of qualifying species within the site are maintained/restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>such there is negligible risk of disruption to migration of diadromous fish species. Therefore, underwater sound associated with the Morgan Generation Assets in combination with the Transmission Assets will not prevent the population and distribution of freshwater pearl mussel within the site from being maintained or restored.</p>	<p>to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of diadromous fish species. Therefore, underwater sound associated with the Morgan Generation Assets in combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the population and distribution of freshwater pearl mussel within the site from being maintained or restored.</p>	<p>556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term,</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of diadromous fish species. Therefore, underwater sound associated with the Morgan Generation Assets in-</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			combination with other plans/projects will not prevent the population and distribution of freshwater pearl mussel within the site from being maintained or restored.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.35 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Kent SAC as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Solway Firth SAC

- 1.5.3.36 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.37 It is concluded that no adverse effects on sea lamprey and river lamprey which undermine the conservation objectives of the Solway Firth SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.35 to 1.5.1.36) is discussed in Table 1.35. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.35: Conclusions against the conservation objectives of the Solway Firth SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species maintained/restored</p> <p>The structure and function of the habitats of qualifying species maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely maintained/restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m fo group 1 fish and 6,700 m for group 2</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morcambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.</p>
<p>The populations of qualifying species are restored</p> <p>The distributions of qualifying species within the site are restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations and distributions of sea lamprey and river lamprey within the site from being maintained or restored.</p>	<p>intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the populations and distributions of sea lamprey and river lamprey within the site from being maintained or restored.</p>	<p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term,</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the populations and distributions of sea lamprey and river lamprey within the site from being maintained or restored.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.38 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Solway Firth as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

River Bladnoch SAC

- 1.5.3.39 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.40 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Bladnoch SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraph 1.5.1.40) is discussed in Table 1.36. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.36: Conclusions against the conservation objectives of the River Bladnoch SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Restore the population of the species, including range of genetic types, as a viable component of the site</p> <p>Restore the distribution of the species throughout the site</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the restoration of the population of Atlantic salmon as a viable component of the site. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the distribution of Atlantic salmon within the site from being restored.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the restoration of the population of Atlantic salmon as a viable component of the site. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m fo group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		<p>distribution of Atlantic salmon within the site from being restored.</p>	<p>underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the restoration of the population of Atlantic salmon as a viable component of the site. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the distribution of Atlantic salmon within the site from being restored.</p>
<p>Restore the habitats supporting the species within the site and availability of food</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term,</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
	<p>sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the habitats supporting Atlantic salmon within the site and availability of food from being restored.</p>	<p>intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the habitats supporting Atlantic salmon within the site and availability of food from being restored.</p>	<p>temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the habitats supporting</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			Atlantic salmon within the site and availability of food from being restored.

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- 1.5.3.41 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Bladnoch SAC as a result of underwater sound impacts with respect to construction and decommissioning of the Morgan Generation Assets in-combination with other plans/projects.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

- 1.5.3.42 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.43 It is concluded that no adverse effects on sea lamprey, river lamprey and Atlantic salmon which undermine the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.47 to 1.5.1.48) is discussed in Table 1.37. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.37: Conclusions against the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The parameters defined in the vision for the watercourse as outlined in NRW (2022b) must be met</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Considering the nature of the potential impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the conservation objectives for the water course from being met.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Considering the nature of the potential impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the conservation objectives for the water course from being met.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m fo group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morcambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Considering the nature of the potential impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the conservation objectives for the water course from being met.</p>
<p>The SAC feature populations will be stable or increasing over the long term</p> <p>The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of sea lamprey, river lamprey and Atlantic salmon. Therefore, underwater</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of sea lamprey, river lamprey and</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the populations of sea lamprey, river lamprey and Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce or likely reduce in the foreseeable future the natural ranges of sea lamprey, river lamprey and Atlantic salmon within the site.</p>	<p>Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the populations of sea lamprey, river lamprey and Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not reduce or likely reduce in the foreseeable future the natural ranges of sea lamprey, river lamprey and Atlantic salmon within the site.</p>	<p>effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of sea lamprey, river lamprey and Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the populations of sea lamprey, river lamprey and Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			Scenario 3 will not reduce or likely reduce in the foreseeable future the natural ranges of sea lamprey, river lamprey and Atlantic salmon within the site.
<p>There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey, river lamprey and Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not lead to reduction in the area or quality of habitat for the populations of sea lamprey, river lamprey and Atlantic salmon in the SAC on a long-term basis.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey, river lamprey and Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not lead to reduction in the area or quality of habitat for the populations of sea lamprey, river lamprey and Atlantic salmon in the SAC on a long-term basis.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m fo group 1 fish and 6,700 m for group 2</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morcambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of sea lamprey, river lamprey and Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not lead to reduction in the area or quality of habitat for the populations of sea lamprey, river lamprey and Atlantic salmon in the SAC on a long-term basis.</p>
<p>All factors affecting the achievement of these conditions are under control.</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Given that the in-combination assessment has concluded that underwater sound impacts will not undermine any of the above conservation objectives, it follows that all</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Given that the in-combination assessment has concluded that underwater sound impacts will not undermine any of the above conservation objectives, it follows that all</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>factors affecting the achievement of these conditions will remain under control.</p>	<p>factors affecting the achievement of these conditions will remain under control.</p>	<p>556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound. Given that the in-combination assessment has concluded that underwater sound impacts will not undermine any of the above conservation objectives, there will be no Adverse Effect on the SAC.</p>

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- 1.5.3.44 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Afon Gwyrfai a Llyn Cwellyn SAC

- 1.5.3.45 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.46 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC will occur as a result of underwater sound associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraph 1.5.1.52) is discussed in Table 1.38. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.38: Conclusions against the conservation objectives of the Afon Gwyrfaï a Llyn Cwellyn SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The conservation objective for the water course as outlined in NRW (2022c) must be met</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Considering the nature of the potential impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the conservation objectives for the water course from being met.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Considering the nature of the potential impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the conservation objectives for the water course from being met.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Considering the nature of the potential impact, there is no pathway for effects to the watercourse to occur. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the conservation objectives for the water course from being met.</p>
<p>The population of the feature in the SAC is stable or increasing over the long term</p> <p>The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>with the Transmission Assets will not prevent the population of Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce or likely reduce in the foreseeable future the natural range of Atlantic salmon within the site.</p>	<p>Morgan Generation Assets in-combination with other plans/projects will not prevent the population of Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not reduce or likely reduce in the foreseeable future the natural range of Atlantic salmon within the site.</p>	<p>fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario will not prevent the population of Atlantic salmon from remaining stable or increasing in the long term. Similarly, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not reduce or likely reduce in</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce the area of the habitats of Atlantic salmon and the Gwyrfai will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the SAC on a long-term basis.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not reduce the area of the habitats of Atlantic salmon and the Gwyrfai will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the SAC on a long-term basis.</p>	<p>the foreseeable future the natural range of Atlantic salmon within the site.</p> <p>Tier 1 Awel y Môr Offshore Wind Farm: Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project: Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2 Morecambe Generation Assets: Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not reduce the area of the habitats of Atlantic salmon and the Gwyrfai will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the SAC on a long-term basis.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.47 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Afon Gwyrfaï a Llyn Cwellyn SAC as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

River Eden SAC

- 1.5.3.48 Any potential in-combination impacts are predicted to be of relatively short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). In addition, any projects/plans which may act in-combination with the Morgan Generation Assets will also have mitigation measures including soft starts which will reduce the potential for in-combination underwater sound effects.

Conclusions

- 1.5.3.49 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Eden SAC will occur as a result of underwater sound in-combination associated with Morgan Generation Assets with other plans/projects. An assessment of the potential impact 'in-combination underwater sound' against each relevant conservation objective (as presented in paragraphs 1.5.1.58 to 1.5.1.59) is discussed in Table 1.39. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.39: Conclusions against the conservation objectives of the River Eden SAC for in-combination underwater sound during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained/restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place over 113.5 days, with injury and mortality to ranges of up to 556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morcambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>There is no pathway for underwater sound to result in adverse effects on the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained/restored</p> <p>The distributions of qualifying species within the site are maintained/restored</p>	<p>Morgan Generation Assets involves single piling of 94 days for wind turbines (jacket and gravity base foundations) plus 12 days for OSP foundations = 114 days (maximum temporal) of piling. Injury and mortality is up to 1.87 km from source for SEL_{cum}. The Transmission Assets is expected to represent only a minor and very short-term contribution to the cumulative under water sound levels generated by the Morgan Generation Assets.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will be intermittent, all projects will implement mitigation measures such as soft starts and</p>	<p>The Morecambe Offshore Windfarm will include up to 756 hours of piling, with an injury and mortality range of up to 6,700 m (for static group 2 fish). Combined with Scenario 1 projects, up to 145.5 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be intermittent, all projects will implement</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Piling to take place over 74 days (maximum of 896 hours). For group 1 fish, injury and mortality will occur for up to 1,300 m, and for group 2 fish, will occur for up to 6,300 m from source, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Mona Offshore Wind Project:</p> <p>Piling to take place place over 113.5 days, with injury and mortality to ranges of up to</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site from being maintained or restored.</p>	<p>mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site from being maintained or restored.</p>	<p>556 m for group 1 fish and 3,180 m for group 2 fish, if fish are static.</p> <p>Combined with Scenario 1 and 2 projects, up to 333 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Piling is to take place for up to 756 hours; injury and mortality ranges are up to 1,300 m for group 1 fish and 6,700 m for group 2 fish, if fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Piling is for up to 44 hours (though may be an overestimate as the OSPs considered here are also included within the Morgan Generation Assets assessment). Injury and mortality are of ranges up to 1,050 m for group 1 fish and 4,340 m for group 2 fish, when fish are static. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term,</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
			<p>temporary and intermittent, impacts on diadromous fish are likely to be negligible.</p> <p>ENI HyNet CCS project:</p> <p>Piling is required for installation of a new platform; the duration of this activity is expected to be far shorter than the piling associated with the Morgan Generation Assets and other offshore wind projects considered, thereby representing only a minor increase in the ensonified area, should piling occur at the same time.</p> <p>Combined with Scenario 1 and 2, and Tier 1 projects, up to 366 days of piling may occur. As group 1 and 2 fish are less sensitive to the effects of underwater sound than group 3 and 4 fish, and as impacts are to be short-term, temporary and intermittent, impacts on diadromous fish are likely to be negligible</p> <p>Tier 3</p> <p>No Tier 3 projects have been identified with potential for in-combination effects associated with impacts from underwater sound.</p> <p>Underwater sound associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will be intermittent, all projects will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. As such there is negligible risk of disruption to migration of Atlantic salmon, sea lamprey and river lamprey. Therefore, underwater sound associated with the Morgan Generation Assets in-combination with other</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			plans/projects considered under Scenario 3 will not prevent the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site from being maintained or restored.

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1.5.3.50 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Eden SAC as a result of underwater sound impacts with respect to construction of the Morgan Generation Assets in combination with other plans/projects.

In-combination EMF from subsea electric cables

1.5.3.51 There is potential for EMF from subsea electrical cabling impacts as a result of activities associated with the Morgan Generation Assets during the operations and maintenance phase, in-combination with activities associated with the following projects/plans: Tier 1 Awel y Môr Offshore Wind Farm, and Mona Offshore Wind Project; the Tier 2 Morecambe Offshore Wind Farm, and Morgan and Morecambe Transmission Assets, and the Tier 3 MaresConnect Wales-Ireland Interconnector Cable and Moir Vannin.

1.5.3.52 The in-combination effects assessment has followed the methodology set out in Volume 1, Chapter 5: EIA methodology of the Environmental Statement. The assessment considered the impact of EMFs from subsea electric cables under the following in-combination scenario (see section 1.4.5, paragraphs 1.4.5.5 to 1.4.5.9).

- Scenario 1: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets
- Scenario 2: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm Generation Assets
- Scenario 3: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside all other projects, plans and activities. This assessment has been allocated into 'tiers' reflecting the current stage of the other projects, plans and activities within the planning and development process. This tiered approach is adopted to provide a clear assessment of the Morgan Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside other projects, plans and activities.

Operations and maintenance phase

Scenario 1

1.5.3.53 For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and interconnector cables of 66 km of 275 kV. Cable minimum burial depth will be 0.5 m, and operations and maintenance will be for up to 35 years.

1.5.3.54 For the Morgan Transmission Assets, interconnector cables are up to 60 km length of 275 kV HVAC cables, and offshore export cables are up to 610 km length, of 220 kV or 275 kV HVAC cables, buried to a minimum of 0.5 m.

1.5.3.55 Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.

Scenario 2

1.5.3.56 Inter-array cables for the Morecambe Generation Assets are of 110 km length, with 10 km of platform link cables, at 132 kV AC transmission. The minimum burial depth for cables if planned to be 0.5 m with a target of 1.5 m depth, therefore limiting EMFs to the range of metres from the cable.

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Scenario 3

Tier 1

- 1.5.3.57 The maximum potential EMF from subsea electric cables impacts associated with the Tier 1 Awel y Môr Offshore Wind Farm will originate from the project's inter-array, interconnector, and offshore export cables, which have the potential for creating an in-combination effect with the inter-array and interconnector cables of the Morgan Generation Assets. For the Awel y Môr Offshore Wind Farm, this is likely to result from the operation of the 145 km of inter-array cables, and 81 km of export cables (RWE, 2022a). The minimum burial depth for cables for Awel y Môr is planned to be 1 m, likely limiting EMF from subsea electrical cabling to the range of up to 10 m from the cable, in line with the predictions for the Morgan Generation Assets.
- 1.5.3.58 For Mona Offshore Wind Project, inter-array cables are of 325 km length and inter-array cables are of 66 kV or 132 kV. The interconnector cables are up to 50 km long and are 275 kV HVAC cables. The offshore export cables are up to 360 km long and are also 275 HVAC cables, buried to a minimum depth of 0.5 m. These are to be in operation and maintenance phases for up to 35 years.

Tier 2

- 1.5.3.59 The maximum potential EMF from subsea electric cables impacts associated with the Tier 2 projects will originate from the inter-array, interconnector cables and offshore export cables of the Mona Offshore Wind Project, the Morecambe Offshore Wind Farm, and the Morgan and Morecambe Transmission Assets. For the Mona Offshore Wind Project, this is likely to result from the operation of up to 325 km of 66 kV to 132 kV inter-array cables, 50 km of 275 kV HVAC interconnector cable, and up to 360 km of 275 kV HVAC offshore export cables. The minimum burial depth for cables will be 0.5 m, likely limiting EMF from subsea electrical cabling to the range of metres from the cable, with potential impacts expected to be similar to the Morgan Generation Assets, due to the similar sizes and extents of the projects (Mona Offshore Wind Ltd, 2023).
- 1.5.3.60 For the Morecambe Offshore Windfarm, the maximum EMF impacts will originate from the inter-array and interconnector cables. This is likely to result from the operation of up to 110 km of up to 132 kV inter-array cables and 10 km of up to 132 kV platform link cables. The burial depth for cables will be between 0.5 m and 3 m with a target burial depth of 1.5 m.
- 1.5.3.61 For the Morgan and Morecambe Offshore Wind Farms Transmission Assets, there will be up to 60 km of 275 kV HVAC interconnector cable and up to 610 km of 220 kV or 275 kV HVAC offshore export cables. The minimum burial depth for cables will be 0.5 m. These HVAC interconnector cables are considered in assessments for the Morgan offshore Wind Project Generation Assets, Morecambe Generation Assets and the Morecambe Offshore Wind Farms Transmission Assets, therefore this assessment is deemed to be highly conservative.
- 1.5.3.62 The proposed operation of Moir Vannin will temporally overlap with the operations and maintenance phase of the Morgan Generation Assets, resulting in an in-combination effect. Specifically, the Moir Vannin inter-array, interconnector and export cables are expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available for either project. However, the overall potential in-combination effect is expected to be small and limited to directly around the cables, with very little overlap between them and the Morgan Generation Assets.

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1.5.3.63 For Mooir Vannin Offshore Windfarm, no quantifiable information is publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Mooir Vannin. Quantities, however, are expected to be similar in scale those associated with Morgan Generation Assets, with the potential for effects up to a range of metres from the cables. Minimal, if any, overlap is predicted with the Morgan Generation Assets and other projects included within the CEA, assuming that cables will be subject to burial or protection of an appropriate thickness.

Tier 3

1.5.3.64 The proposed operation of the MaresConnect Interconnector Cable will temporarily overlap with the operations and maintenance phase of the Morgan Generation Assets, resulting in an in-combination effect. Specifically, the MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available for this project. However, the overall potential in-combination effect is expected to be small and limited to directly around the cables, with very little overlap between the MaresConnect Interconnector Cable and the Morgan Generation Assets.

1.5.3.65 The overall potential impact during operations and maintenance of the various projects listed above (Scenarios 1 to 3) will have a negligible impact on Annex II diadromous fish species from changes in EMF. Potential effects from EMFs on the relevant conservation objectives of SACs are discussed in turn below.

River Ehen SAC

1.5.3.66 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as some (such as lamprey at certain times) are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are expected to implement mitigation including cable burial or the application of cable protection. Whilst the burial of cables (or cable protection) does not reduce EMF, it will increase the distance between cables and diadromous fish, and the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

1.5.3.67 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Ehen SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objectives (as presented in paragraphs 1.5.1.9) is discussed in Table 1.40. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.40: Conclusions against the conservation objectives of River Ehen SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained/restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of Atlantic salmon and freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon and freshwater pearl mussel or the supporting processes on which the</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to affect the habitats of Atlantic salmon and freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon and freshwater pearl mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm: Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project: Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets: Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets: Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	habitats of Atlantic salmon and freshwater pearl mussel rely from being maintained or restored.		<p>export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects to affect the habitats of Atlantic salmon and freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the projects/plans considered under Scenario 3 will not prevent the extent, distribution,</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			structure and function of the habitats of Atlantic salmon and freshwater pearl mussel or the supporting processes on which the habitats of Atlantic salmon and freshwater pearl mussel rely from being maintained or restored.
<p>The populations of qualifying species are maintained/restored</p> <p>The distributions of qualifying species within the site are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Atlantic salmon are considered to have relatively low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon and</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Atlantic salmon are considered to have relatively low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon and freshwater pearl mussel within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm: Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project: Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets: Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>freshwater pearl mussel within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>		<p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Atlantic salmon are considered to have relatively low</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon and freshwater pearl mussel within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the projects/plans considered under Scenario 3.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.68 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Ehen SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Dee Estuary/Aber Dyfrdwy SAC

- 1.5.3.69 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.70 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electrical cabling against each relevant conservation objective (as presented in paragraphs 1.5.1.16 and 1.5.1.18) is discussed in Table 1.41. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.41: Conclusions against the conservation objectives of Dee Estuary/Aber Dyfrdwy SAC for in-combination EMF from subsea electric cables.

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality.</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>EMF effects associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial. In addition, Annex II diadromous fish are considered to have low sensitivity to EMF. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>EMF effects associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial. In addition, Annex II diadromous fish are considered to have low sensitivity to EMF. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moir Vannin.</p> <p>Tier 3 MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>EMF effects associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial. In addition, Annex II diadromous fish are considered to have low sensitivity to EMF. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.</p>
<p>The five year mean count of river lampreys recorded by the</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables</p>	<p>Tier 1</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

<p>Conservation objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
<p>Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000).</p>	<p>cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF effects associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of lamprey species will not be reduced.</p>	<p>and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF effects associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of lamprey species will not be reduced.</p>	<p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF effects associated with the Morgan Generation Assets in combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of lamprey species will not be reduced.</p>
<p>The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF effects associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.</p>	<p>Given that EMF effects associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.</p>	<p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF effects associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.71 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Dee Estuary/Aber Dyfrdwy SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

River Derwent and Bassenthwaite Lake SAC

- 1.5.3.72 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.73 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Derwent and Bassenthwaite Lake SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraphs 1.5.1.19 to 1.5.1.25) is discussed in Table 1.42. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.42: Conclusions against the conservation objectives of River Derwent and Bassenthwaite Lake SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained/restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to affect the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 to affect the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained/restored</p> <p>The distributions of qualifying species within the site are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.74 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Derwent and Bassenthwaite Lake SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

River Kent SAC

- 1.5.3.75 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.76 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Derwent and Bassenthwaite Lake SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraphs 1.5.1.29 to 1.5.1.30) is discussed in Table 1.43. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.43: Conclusions against the conservation objectives of River Kent SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained/restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to affect the habitats of freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>minimum burial depth of the inter-array and export cables associated with Mooir Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 to affect the habitats of freshwater pearl mussel. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other plans/projects will not prevent the extent, distribution, structure and function of the habitats of freshwater pearl mussel or the supporting processes on which the habitats of freshwater pearl mussel rely from being maintained or restored.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are restored</p> <p>The distributions of qualifying species within the site are restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of freshwater pearl mussel within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of freshwater pearl mussel within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>export cables associated with Mooir Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of freshwater pearl mussel within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3.</p>

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- 1.5.3.77 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Kent SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Solway Firth SAC

- 1.5.3.78 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.79 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the Solway Firth SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraphs 1.5.1.35 to 1.5.1.36) is discussed in Table 1.44. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.44: Conclusions against the conservation objectives of Solway Firth SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained/restored</p> <p>The structure and function of the habitats of qualifying species are maintained/restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects to affect the habitats of sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>minimum burial depth of the inter-array and export cables associated with Mooir Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects to affect the habitats of sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the extent, distribution, structure and function of the habitats of sea lamprey and river lamprey or the supporting processes on which the habitats of sea lamprey and river lamprey rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The distributions of qualifying species within the site are maintained/restored</p>	<p>cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets.</p>	<p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.3.80 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Solway Firth SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

River Bladnoch SAC

- 1.5.3.81 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.82 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Bladnoch SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact ‘in-combination EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraph 1.5.1.40) is discussed in Table 1.45. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.45: Conclusions against the conservation objectives of River Bladnoch SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Restore the population of the species, including range of genetic types, as a viable component of the site</p> <p>Restore the distribution of the species throughout the site</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of Atlantic salmon will not be prevented from being restored as a viable component of the site as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets. Similarly, EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets will not prevent the distribution of</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of Atlantic salmon will not be prevented from being restored as a viable component of the site as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other the Transmission Assets and the Morecambe Generation Assets. Similarly, EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the distribution of Atlantic salmon from being restored throughout the site.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	Atlantic salmon from being restored throughout the site.		<p>minimum burial depth of the inter-array and export cables associated with Mooir Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of Atlantic salmon will not be prevented from being restored as a viable component of the site as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3. Similarly, EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>the distribution of Atlantic salmon from being restored throughout the site.</p>
<p>Restore the habitats supporting the species within the site and availability of food</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of Atlantic salmon, therefore the habitats supporting Atlantic salmon within the sites and availability of food will not be prevented from being restored.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to affect the habitats of Atlantic salmon, therefore the habitats supporting Atlantic salmon within the sites and availability of food will not be prevented from being restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moir Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 to affect the habitats of Atlantic salmon, therefore the habitats supporting Atlantic salmon within the sites and availability of food will not be prevented from being restored.</p>

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- 1.5.3.83 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Bladnoch SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

- 1.5.3.84 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.85 It is concluded that no adverse effects on qualifying features which could undermine the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.5.1.47 to 1.5.1.48) is discussed in Table 1.46. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.46: Conclusions against the conservation objectives of River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The parameters defined in the vision for the watercourse as defined in NRW (2022b) must be met</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway between in-combination EMF from subsea electrical cabling with Morgan Generation Assets in-combination with the Transmission Assets and the watercourse to occur. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the parameters defined in the vision for the watercourse as outlined in NRW (2022b) from being met.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway between in-combination EMF from subsea electrical cabling with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets and the watercourse to occur. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the parameters defined in the vision for the watercourse as outlined in NRW (2022b) from being met.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>minimum burial depth of the inter-array and export cables associated with Mooir Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway between in-combination EMF from subsea electrical cabling with Morgan Generation Assets in-combination with other plans/projects and the watercourse to occur. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects will not prevent the parameters defined in the vision for the watercourse as outlined in NRW (2022b) from being met.</p>
<p>The SAC feature populations will be stable or increasing over the long term</p> <p>The natural range of the features in the SAC is neither being reduced nor is likely to be</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>reduced for the foreseeable future</p>	<p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the populations of sea lamprey, river lamprey and Atlantic salmon within the site will not be prevented from remaining stable or increasing in the long term. Similarly, the natural ranges of sea lamprey, river lamprey and Atlantic salmon will neither be reduced or likely be reduced in the foreseeable future as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>and the Morecambe Offshore Windfarm Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the populations of sea lamprey, river lamprey and Atlantic salmon within the site will not be prevented from remaining stable or increasing in the long term. Similarly, the natural ranges of sea lamprey, river lamprey and Atlantic salmon will neither be reduced or likely be reduced in the foreseeable future as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm Generation Assets.</p>	<p>275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable,</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the populations of sea lamprey, river lamprey and Atlantic salmon within the site will not be prevented from remaining stable or increasing in the long term. Similarly, the natural ranges of sea lamprey, river lamprey and Atlantic salmon will neither be reduced or likely be reduced in the foreseeable future as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with projects considered under Scenario 3.</p>
<p>There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for EMF from subsea electrical cabling associated with Morgan</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to affect the habitats of sea lamprey, river lamprey and Atlantic salmon. Therefore, there will be no reduction in the area or quality of habitat for the populations of</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Generation Assets in-combination with the Transmission Assets to affect the habitats of sea lamprey, river lamprey and Atlantic salmon. Therefore, there will be no reduction in the area or quality of habitat for the populations of sea lamprey, river lamprey and Atlantic salmon in the SAC on a long-term basis.</p>	<p>sea lamprey, river lamprey and Atlantic salmon in the SAC on a long-term basis.</p>	<p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			plans/projects considered under Scenario 3 to affect the habitats of sea lamprey, river lamprey and Atlantic salmon. Therefore, there will be no reduction in the area or quality of habitat for the populations of sea lamprey, river lamprey and Atlantic salmon in the SAC on a long-term basis.
<p>All factors affecting the achievement of these conditions are under control</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that the in-combination assessment has concluded that EMF impacts will not undermine any of the above conservation objectives, it follows that all factors affecting the achievement of these conditions will remain under control.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that the in-combination assessment has concluded that EMF impacts will not undermine any of the above conservation objectives, it follows that all factors affecting the achievement of these conditions will remain under control.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm: Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project: Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets: Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets: Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that the in-combination assessment has concluded that EMF impacts will not undermine any of the above conservation objectives, it follows that all factors affecting the achievement of these conditions will remain under control.</p>

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- 1.5.3.86 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Afon Gwyrfai a Llyn Cwellyn SAC

- 1.5.3.87 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.88 It is concluded that no adverse effects on Atlantic salmon which undermine the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.5.1.52) is discussed in Table 1.47. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.47: Conclusions against the conservation objectives of Afon Gwyrfaï a Llyn Cwellyn SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The conservation objective for the water course must be met.</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway between in-combination EMF from subsea electrical cabling with Morgan Generation Assets in-combination with the Transmission Assets and the watercourse to occur. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the parameters defined in the vision for the watercourse from being met.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway between in-combination EMF from subsea electrical cabling with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets and the watercourse to occur. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not prevent the parameters defined in the vision for the watercourse from being met.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway between in-combination EMF from subsea electrical cabling with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 and the watercourse to occur. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects will not prevent the parameters defined in the vision for the watercourse from being met.</p>
<p>The population of the feature in the SAC is stable or increasing over the long term.</p> <p>The natural range of the feature in the SAC is neither being reduced nor is likely to</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>be reduced for the foreseeable future.</p>	<p>up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of Atlantic salmon will not be prevented from remaining stable or increasing in the long term as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets. Similarly, the natural range of Atlantic salmon in the SAC will neither be reduced nor is likely to be reduced for the foreseeable future as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of Atlantic salmon will not be prevented from remaining stable or increasing in the long term as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets. Similarly, the natural range of Atlantic salmon in the SAC will neither be reduced nor is likely to be reduced for the foreseeable future as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets.</p>	<p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of Atlantic salmon will not be prevented from remaining stable or increasing in the long term as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3. Similarly, the natural range of Atlantic salmon in the SAC will neither be reduced nor is likely to be reduced for the foreseeable future as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3.</p>
<p>The Gwyrfaï will continue to be a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis.</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p>	<p>Tier 1</p> <p>Awel y Mor Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of Atlantic salmon within the SAC. The Gwyrfai will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the Afon Gwyrfai a Llyn Cwellyn SAC on a long-term basis.</p>	<p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to affect the habitats of Atlantic salmon within the SAC. The Gwyrfai will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the Afon Gwyrfai a Llyn Cwellyn SAC on a long-term basis.</p>	<p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 to affect the habitats of Atlantic salmon within the SAC. The Gwyrfai will continue to be a sufficiently large habitat to maintain the population of Atlantic salmon in the Afon Gwyrfai a Llyn Cwellyn SAC on a long-term basis.</p>

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- 1.5.3.89 Therefore, it can be concluded beyond reasonable scientific doubt that there **is no risk of an adverse effect on the integrity** of the Afon Gwyrfai a Llyn Cwellyn SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

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- 1.5.3.90 Whilst any potential in-combination impacts are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability to EMF from subsea electric cables. EMF from subsea electrical cabling effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea electrical cabling as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect will implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMF from subsea electric cables, thereby reducing the effect of EMF from subsea electrical cabling on diadromous fish.

Conclusions

- 1.5.3.91 It is concluded that no adverse effects on qualifying features which undermine the conservation objectives of the River Eden SAC will occur as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects. An assessment of the potential impact 'in-combination EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraphs 1.5.1.58 to 1.5.1.59) is discussed in Table 1.48. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.48: Conclusions against the conservation objectives of River Eden SAC for in-combination EMF from subsea electric cables.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained or restored</p> <p>The structure and function of the habitats of qualifying species are restored</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p> <p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets to affect the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of 1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm Generation Assets to affect the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm Generation Assets will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p> <p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p> <p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>There is no pathway for in-combination EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 to affect the habitats of Atlantic salmon, sea lamprey and river lamprey. Therefore, EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3 will not prevent the extent, distribution, structure and function of the habitats of Atlantic salmon, sea lamprey and river lamprey or the supporting processes on which the habitats of Atlantic salmon, sea lamprey and river lamprey rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained/restored</p>	<p>For the Morgan Generation Assets, inter-array cables will be between 390 km of cables of 66 kV to 132 kV, and HVAC cables of 60 km of 275 kV. Minimum burial depth will be 0.5 m.</p>	<p>For the Morecambe Offshore Windfarm, there will be 110 km of inter-array cables and 10 km of platform link cables, with 132 kV AC transmission. The minimum burial depth for cables is planned to be 0.5 m with a target of</p>	<p>Tier 1</p> <p>Awel y Môr Offshore Wind Farm:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The distributions of qualifying species within the site are maintained/restored</p>	<p>For the Morgan Transmission Assets, interconnector cables are up to 60 km long of 275 kV HVAC and offshore export cables are up to 610 km of 220 kV HVAC cables, buried to a minimum of 0.5 m.</p> <p>Effects of EMFs are expected to be limited to a range of just metres from the cables associated with both Morgan Generation Assets and the Transmission Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>1.5 m burial depth, thus limiting EMFs to the range of metres from the cable.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm Generation Assets will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm Generation Assets.</p>	<p>Cables of 145 km (inter-array) and 81.3 km (export), buried to a minimum of 1 m, thus limiting EMFs to up to 10 m from the cable.</p> <p>Mona Offshore Wind Project:</p> <p>Cables of up to 500 km of 66 kV to 132 kV inter-array cables, and 50 km of 275 kV HVAC interconnector cables, with up to 360 km of 275 kV HVAC offshore export cables. To be buried at 0.5 m depth, limiting EMFs to metres from the cable.</p> <p>Tier 2</p> <p>Morecambe Offshore Windfarm Generation Assets:</p> <p>Cables of 110 km length (inter-array) and 10 km of platform link cables, with 132 kV AC transmission. Minimum burial depth for cables planned to be 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Morgan and Morecambe Transmission Assets:</p> <p>Cables up to 60 km length of 275 kV HVAC interconnector cables, and 610 km of 220 kV or 275 kV HVAC export cables, buried at 0.5 m, thus limiting EMFs to metres from the cable.</p> <p>Moor Vannin Offshore Windfarm:</p> <p>There is no quantifiable information publicly available with regards to the quantity or minimum burial depth of the inter-array and export cables associated with Moor Vannin.</p> <p>Tier 3</p> <p>MaresConnect Wales-Ireland Interconnector Cable:</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>The MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available. However, the overall potential cumulative impact is expected to be small and limited to directly around the cable, with very little to no overlap between it and the Morgan Generation Assets.</p> <p>Given that EMF from subsea electrical cabling associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will be localised in spatial extent, all projects will implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF from subsea electric cables, the populations and distributions of Atlantic salmon, sea lamprey and river lamprey within the site will not be prevented from being maintained or restored as a result of EMF from subsea electrical cabling associated with Morgan Generation Assets in-combination with other plans/projects considered under Scenario 3.</p>

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1.5.3.92 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the River Eden SAC as a result of EMF from subsea electrical cabling with respect to the Morgan Generation Assets in-combination with other plans/projects.

1.6 Assessment of potential Adverse Effect on Integrity: Annex II marine mammals

1.6.1 Introduction

1.6.1.1 Screening of designated sites (HRA Stage 1 Screening Report (Document Reference E1.4), together with consultation feedback (see section 1.3), identified potential for LSEs on the qualifying Annex II marine mammal features of all European sites within the same MU, (OSPAR Region III for grey seals) as the Morgan Generation Assets for each Annex II marine mammal species.

1.6.1.2 The screening exercise (HRA Stage 1 Screening Report (Document Reference E1.4) therefore identified the potential for LSEs on the European sites (Figure 1.5) designated for Annex II marine mammal features which are listed in Table 1.49.

Table 1.49: European sites and relevant Annex II marine mammal features for which the potential for LSE could not be ruled out and therefore considered in the Appropriate Assessment.

SAC/SCI	Annex II marine mammal features
Twelve sites in the United Kingdom	
North Anglesey Marine SAC	Harbour porpoise
North Channel SAC	Harbour porpoise
Strangford Lough SAC	Harbour seal
Murlough SAC	Harbour seal
Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC	Bottlenose dolphin Grey seal
The Maidens SAC	Grey seal
Cardigan Bay/Bae Ceredigion SAC	Bottlenose dolphin Grey seal
Pembrokeshire Marine/Sir Benfro Forol SAC	Grey seal
Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC	Harbour porpoise
Lundy SAC	Grey seal
Isles of Scilly Complex SAC	Grey seal
West Wales Marine/Gorllewin Cymru Forol SAC	Harbour porpoise
Four sites in Ireland	
Rockabill to Dalkey Island SAC	Harbour porpoise
Saltee Islands SAC	Grey seal
Roaringwater Bay and Islands SAC	Harbour porpoise
Blasket Islands SAC	Harbour porpoise
17 sites in France	

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SAC/SCI	Annex II marine mammal features
Mers Celtiques - Talus du golfe de Gascogne	Harbour porpoise
Abers - Côte des légendes	Harbour porpoise
Ouessant-Molène	Harbour porpoise
Côte de Granit rose-Sept-Iles	Harbour porpoise
Anse de Goulven, dunes de Keremma	Harbour porpoise
Tregor Goëlo	Harbour porpoise
Côtes de Crozon	Harbour porpoise
Chaussée de Sein	Harbour porpoise
Cap Sizun	Harbour porpoise
Récifs du talus du golfe de Gascogne	Harbour porpoise
Anse de Vauville	Harbour porpoise
Cap d'Erquy-Cap Fréhel	Harbour porpoise
Baie de Saint-Brieuc – Est	Harbour porpoise
Banc et récifs de Surtainville	Harbour porpoise
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	Harbour porpoise
Estuaire de la Rance	Harbour porpoise
Baie du Mont Saint Michel	Harbour porpoise

1.6.1.3 Following feedback from Natural England in the Marine Mammal EWG meetings for the Morgan Generation Assets, the potential for an Adverse Effect on Integrity is considered for all Annex II marine mammal SACs located within English, English/Welsh waters and Northern Irish waters (sections 1.6.4 and 1.6.5). However, for European sites located exclusively in Welsh, Irish or French waters, the recommended approach by NRW has been adopted. The recommended approach by NRW follows an iterative process that assesses, in the first instance, the impacts on the European site within the relevant MU for each qualifying species which is closest to the Morgan Generation Assets. The conclusion from the site closest to the Morgan Generation Assets is then applied to the remaining sites. In the event that the assessment concluded an Adverse Effect on Integrity for the closest site, the next closest site should then be considered in full, and so on (NRW, 2022c). This approach was presented in the marine mammal EWGs and the SNCBs (including Natural England and the MMO) raised no objections to this approach (see Table 1.1).

1.6.1.4 If it can be concluded that there is no Adverse Effect on Integrity for the closest site, then any impact on European sites located at a greater distance from the Morgan Generation Assets would be of a lower magnitude and therefore an Adverse Effect on Integrity can also be ruled out on those European sites. On the basis that there is no overlap with any SAC for marine mammals, for sites at increased distances from the Morgan Generation Assets the risks are very low. The key impacts will relate to disturbance effects (and consequential impacts to the characteristics of the population, viability of the species as a component of the site etc.) and therefore the conclusions made for the closest site are deemed applicable to the conservation objectives of all more distant sites for the same features. This iterative approach, as recommended by

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NRW, allows for a more proportionate HRA Stage 2 ISAA to be prepared, and ensures that the focus is on European sites for which potential impacts are considered to be greater. Natural England raised no objections to this approach.

- 1.6.1.5 As detailed in paragraph 1.6.1.3, the approach recommended by NRW advisory services for harbour porpoise was, in the first instance, to assess the impacts on the European site within the Celtic and Irish Seas MU which is closest to the Morgan Generation Assets (i.e. North Anglesey Marine/Gogledd Môn Forol SAC) and use those conclusions to assess the remaining sites. In the event that the assessment concluded an Adverse Effect on Integrity for the closest site, the next closest site should then be considered, and so on. Therefore, the North Anglesey Marine/Gogledd Môn Forol SAC is assessed for relevant impacts in section 1.6.4.
- 1.6.1.6 The same approach has also been recommended for bottlenose dolphin within the IS MU, therefore Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC has been assessed below. The NRW position paper on the use of marine mammal MUs for screening and assessment in HRA for SACs with marine mammal features (NRW, 2022c) also suggests that Cardigan Bay/Bae Ceredigion SAC should be assessed based on photo-ID evidence which shows that most individual dolphins move between the two SACs, suggesting that the populations of the two SACs are highly connected, and that there is likely a single generic population across the MU. The Cardigan Bay/Bae Ceredigion SAC has therefore also been considered in section 1.6.4.
- 1.6.1.7 For grey seal and harbour seal, as per the HRA Stage 1 Screening Report (Document Reference E1.4) and consultation with NRW, all sites within the relevant MUs for each species were brought forward to the HRA Stage 2 ISAA Part 2 – SAC assessments (i.e. the Wales MU, North West England MU, SW Scotland and Northern Ireland MU for grey seal and the Wales MU and North West England MU for harbour seal). Following feedback from NRW, for grey seal, relevant MUs were also considered in parallel with the OSPAR Region III reference population. Additional sites were identified to consider foraging ranges from Carter *et al.* (2022) and telemetry data from Wright and Sinclair (2022). On this basis, for grey seal, the Isles of Scilly Complex SAC, Lundy SAC, The Maidens SAC and Saltee Islands SAC were carried forward to the HRA Stage 2 ISAA Part 2 – SAC assessments.
- 1.6.1.8 For harbour seal, based on telemetry data from Wright and Sinclair (2022) Strangford Lough SAC and Murlough SAC were also brought forward to this HRA Stage 2 ISAA Part 2 – SAC assessments. As above, an iterative approach to assessment will be undertaken and the closest site to the Morgan Generation Assets (Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC for grey seal and Strangford Lough SAC for harbour seal) assessed in the first instance. In addition, in line with the NRW position paper (NRW, 2022c) the Pembrokeshire Marine/Sir Benfro Forol SAC will also be considered as the SAC supports the highest grey seal pupping within the Celtic and Irish Seas part of the OSPAR Region III area.
- 1.6.1.9 In light of paragraph 1.6.1.3 to 1.6.1.8 the list of the European sites considered in full for the Appropriate Assessment along with relevant Annex II marine mammal qualifying features are listed in Table 1.50.

Table 1.50. List of European Sites considered in full for the Appropriate Assessment along with relevant Annex II marine mammal qualifying features.

SAC	Annex II marine mammal features
North Anglesey Marine SAC	Harbour porpoise

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SAC	Annex II marine mammal features
North Channel SAC	Harbour porpoise
Strangford Lough SAC	Harbour seal
Murlough SAC	Harbour seal
Llwyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC	Bottlenose dolphin Grey seal
The Maidens SAC	Grey seal
Cardigan Bay/Bae Ceredigion SAC	Bottlenose dolphin
Pembrokeshire Marine/Sir Benfro Forol SAC	Grey seal
Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC	Harbour porpoise
Lundy SAC	Grey seal
Isles of Scilly Complex SAC	Grey seal

1.6.1.10 As outlined in paragraph 1.6.1.9, for the sites listed in Table 1.50, a full assessment has been undertaken using information supplied in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). For European sites located exclusively in Welsh, Irish or French waters an iterative approach has been followed, whereby a conclusion for the potential for an adverse effect on site integrity is provided for each site based on the distance from the Morgan Generation Assets. This iterative approach applies to the West Wales Marine/Gorllewin Cymru Forol SAC, Rockabill to Dalkey Island SAC, Saltee Islands SAC, Roaringwater Bay and Islands SAC, Blasket Islands SAC, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC and the 17 French SCIs (see Table 1.49).

1.6.1.11 LSEs on these European sites were identified for the following impacts:

- During the construction and decommissioning phases
 - Injury and disturbance from elevated underwater sound during piling
 - Injury and disturbance from elevated underwater sound during UXO clearance
 - Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys
 - Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities
 - Changes in fish and shellfish communities affecting prey availability (North Anglesey Marine/Gogledd Môn Forol SAC only during the construction phase)
- During the operations and maintenance phase
 - Elevated underwater sound due to vessel use and other vessel activities.

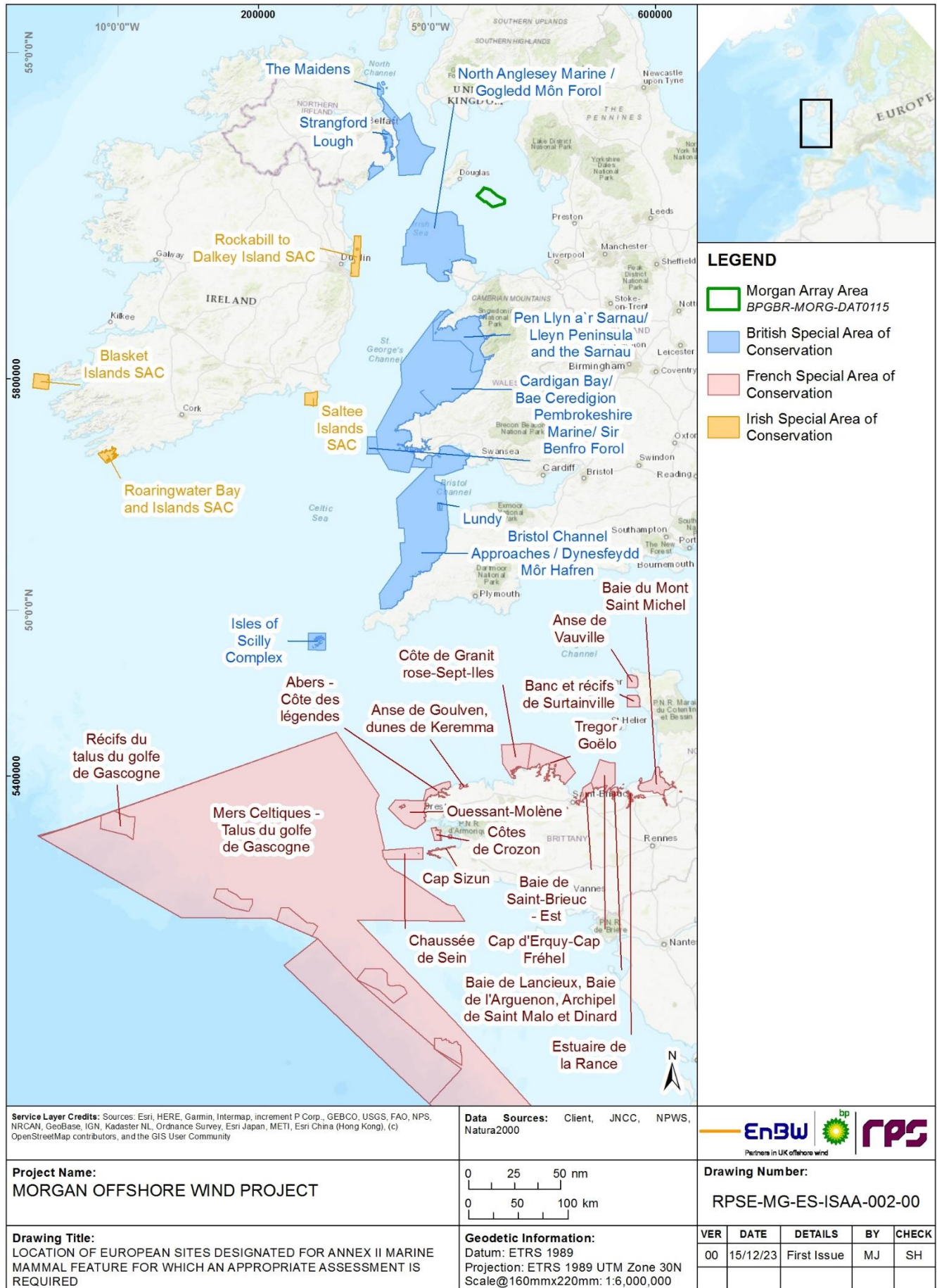
1.6.1.12 Baseline information is provided in section 1.6.2 for the European sites identified in Table 1.50, including information to support the Appropriate Assessment such as site descriptions, feature information, conservation objectives and condition assessments for the relevant European sites.

1.6.1.13 Section 1.6.4 presents the HRA Stage 2 assessments (considering effects both alone and in-combination) for these European sites. A summary of all Appropriate

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Assessments undertaken within this report is provided in the concluding section of this report (section 1.7).

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<p>Project Name: MORGAN OFFSHORE WIND PROJECT</p>	<p>0 25 50 nm 0 50 100 km</p>	<p>Drawing Number: RPSE-MG-ES-ISAA-002-00</p>										
<p>Drawing Title: LOCATION OF EUROPEAN SITES DESIGNATED FOR ANNEX II MARINE MAMMAL FEATURE FOR WHICH AN APPROPRIATE ASSESSMENT IS REQUIRED</p>	<p>Geodetic Information: Datum: ETRS 1989 Projection: ETRS 1989 UTM Zone 30N Scale@160mmx220mm: 1:6,000,000</p>	<table border="1"> <thead> <tr> <th>VER</th> <th>DATE</th> <th>DETAILS</th> <th>BY</th> <th>CHECK</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>15/12/23</td> <td>First Issue</td> <td>MJ</td> <td>SH</td> </tr> </tbody> </table>	VER	DATE	DETAILS	BY	CHECK	00	15/12/23	First Issue	MJ	SH
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Figure 1.5: Location of European Sites designated for Annex II marine mammal features for which an Appropriate Assessment is required.

1.6.2 Baseline information

1.6.2.1 Baseline information on the Annex II marine mammal features of the European sites identified for further assessment within the HRA process has been gathered through a comprehensive desktop study of existing studies and datasets, using the latest available information on marine mammals in the Irish Sea. The baseline is informed by the 24-month site-specific aerial survey data and baseline characterisation presented in Volume 4, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference F.4.4.1) and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).

North Anglesey Marine/Gogledd Môn Forol SAC

Site description

1.6.2.2 The North Anglesey Marine/Gogledd Môn Forol SAC is 28.2 km away from the Morgan Generation Assets. The North Anglesey Marine/Gogledd Môn Forol SAC covers an area of 3,249 km² and extends from Anglesey in a northwest direction into the Irish Sea. The site is designated for harbour porpoise. Water depths within the site range from mean low water tide level to 100 m with average depths of around 40 m to 50 m across the site (NRW and JNCC, 2016). Seabed substrates across the SAC include rock, coarse sediment, sand and muds. These physical characteristics of the site are well aligned to the environmental variables determining the probability of presence and the density of harbour porpoise and the site has been recognised as an area with predicted persistent high densities of harbour porpoise (NRW and JNCC, 2016). The SAC provides important summer habitat for porpoises and is identified as part of the top 10% persistent high density areas for harbour porpoise during the summer season within the UK (NRW and JNCC, 2016).

Feature accounts

Harbour porpoise

1.6.2.3 Harbour porpoise is the most common and widespread cetacean species in Welsh waters (Baines and Evans, 2012) with hot spots identified off the Pembrokeshire coast; the Llyn Peninsula (to a lesser extent); in south Cardigan Bay; and in the Bristol Channel off the south coast of Wales (around the Gower Peninsula and in Newport Bay) (Baines and Evans, 2012).

1.6.2.4 As outlined above, the North Anglesey Marine/Gogledd Môn Forol site was identified as being within the top 10% of persistent high-density areas for harbour porpoise in UK waters during the summer season (Heinänen and Skov, 2015). The Small Cetacean Abundance in the North Sea (SCANS) SCANS-II surveys in 2005 estimated that the site supports approximately 1084 individuals (95% Confidence Interval: 557 to 2111) for at least part of the year and represents approximately 4% of the population within the UK part of the Celtic and Irish Sea (CIS) MU (JNCC, NRW and Department for Agriculture, Environment and Rural Affairs (DAERA) 2019). This however cannot be considered as a site population estimate as this estimate is from a one-month survey in a single year (JNCC, NRW and DAERA, 2019).

Condition assessment

1.6.2.5 There is no condition assessment available for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conservation objectives

1.6.2.6 The conservation objectives as outlined in JNCC, NRW and DAERA (2019)¹⁹ and considered in the assessment which are relevant to the harbour porpoise feature are outlined below:

- To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters.

1.6.2.7 In the context of natural change, this will be achieved by ensuring that:

- Harbour porpoise is a viable component of the site
- There is no significant disturbance of the species
 - Sound disturbance within an SAC from a plan/project individually or in-combination is significant if it excludes harbour porpoises from more than:
 - 20% of the relevant area²⁰ of the site in any given day²¹
 - An average of 10% of the relevant area of the site over a season^{22,23}
- The condition of supporting habitats and processes, and the availability of prey is maintained.

North Channel SAC

Site description

1.6.2.8 The North Channel SAC, which is 64.0 km away from the Morgan Generation Assets, is located in between the North Channel and the northwest Irish Sea between Northern Ireland, Scotland and the Isle of Man. The SAC covers an area of 1,604 km². The SAC runs along the east coast of Northern Ireland, connects with the Maidens SAC to the north and stands in proximity to the Murlough SAC and Strangford Lough SAC to the southwest. The SAC extends from coastal to offshore waters with water depths across most of the site ranging between 10 m to 40 m deep, with a maximum of 150 m to the east boundary. Seabed substrates across the SAC include mainly coarse or sandy sediments, with patches of rock and mud and the site overlaps with the Pisces Reef Complex SAC.

Feature accounts

Harbour porpoise

1.6.2.9 Harbour porpoise is listed as an Annex II species present as a qualifying feature and a primary reason for site selection.

1.6.2.10 The site provides important winter habitat for harbour porpoise and some of the largest groups of harbour porpoise (up to 100 individuals) around Northern Ireland have been

¹⁹ <https://data.jncc.gov.uk/data/f4c19257-2341-46b3-8e29-49665cd8f3d2/NorthAnglesey-Conservation-Advice.pdf>

²⁰ The relevant area is defined as that part of the SAC that was designated on the basis of higher persistent densities for that season (summer defined as April to September inclusive, winter as October to March inclusive).

²¹ Applicable only in HRA due to impracticality of daily sound limit management of activities, but retrospective compliance analysis advised

²² Summer defined as April to September inclusive, winter as October to March inclusive

²³ For example, a daily footprint of 19% for 95 days would result in an average of 19x95/183 days (summer) =9.86%

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observed within the site. The site has been recognised as an area with predicted persistent high densities of harbour porpoise (IAMMWG, 2015). The SAC is estimated to support 1.2% of the UK CIS MU population and to be within the top 10% of persistent high density areas for the MU during the winter season (Heinänen and Skov, 2015). The SCANS-II surveys in 2005 estimated that the site supports approximately 537 individuals (95% Confidence Interval: 276 to 1046) for at least part of the year (JNCC and DAERA, 2017). This however cannot be considered as a site population estimate as this estimate is derived from a one-month survey in a single year (JNCC and DAERA, 2017).

Condition assessment

1.6.2.11 There is no condition assessment available for the harbour porpoise feature of the North Channel SAC at the time of writing.

Conservation objectives

1.6.2.12 The conservation objectives relevant to the harbour porpoise, as outlined in JNCC and DAERA (2019)²⁴ and considered in the assessment which are feature are set out below.

1.6.2.13 To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters.

1.6.2.14 In the context of natural change, this will be achieved by ensuring that:

- Harbour porpoise is a viable component of the site
- There is no significant disturbance of the species
 - Sound disturbance within an SAC from a plan/project individually or in combination is significant if it excludes harbour porpoises from more than
 - 20% of the relevant area of the site in any given day
 - An average of 10% of the relevant area of the site over a season
- The condition of supporting habitats and processes, and the availability of prey is maintained.

Strangford Lough SAC

Site description

1.6.2.15 The Strangford Lough SAC, is 94.7 km away from Morgan Generation Assets and 15 km east of central Belfast. The lough is a large marine inlet spanning 150 km² on the east coast of County Down, of which about 50 km² lies between high water mark mean tide and low water mark mean tide. The lough is separated from the Irish Sea by the Ards Peninsula to the east and is connected to the open sea by the Strangford Narrows. The triangular area around the lough mouth is exposed to high wave energy and this area has rock platforms, steeply-shelving rocky shores and a sandy seabed.

²⁴ <https://data.jncc.gov.uk/data/be0492aa-f1d6-4197-be22-e9a695227bdb/NorthChannel-conservation-advice.pdf>

Feature accounts

Harbour seal

- 1.6.2.16 Harbour seal is a qualifying feature of the Strangford Lough SAC, however, it is not a primary reason for site selection.
- 1.6.2.17 A review conducted by Culloch *et al.* (2018) reported that in Strangford Lough, there was a 2.01% and a 1.31% annual decrease in harbour seal adults and pups, respectively (using data from 1995 to 2014, inclusive). Although it is highly likely that varying effort across years and areas has played an influential role in the trends identified.

Condition assessment

- 1.6.2.18 Overall, the condition assessment deemed that harbour seal are in unfavourable, declining condition although the condition of supporting habitats is currently unknown (DAERA, 2019)²⁵.

Conservation objectives

- 1.6.2.19 The conservation objectives outlined in DAERA (2018a)²⁶ and considered in the assessment which are relevant to the harbour seal feature are outlined below:
- To maintain (or restore where appropriate) the harbour seal feature to favourable condition
 - Restore, maintain and enhance, as appropriate, the harbour seal population
 - Restore, maintain and enhance, as appropriate, physical features used by harbour seal within the site.

Murlough SAC

Site description

- 1.6.2.20 The Murlough SAC, which is 98.4 km away from the Morgan Generation Assets, is located on the southeast coast of Northern Ireland. The Murlough SAC encompasses the shallow waters of the Dundrum Bay which represent the largest area of shallow sub-littoral sandbanks in Northern Ireland. The SAC spans over 119 km² in the northwest Irish Sea.

Feature accounts

Harbour seal

- 1.6.2.21 Harbour seal is a qualifying feature of the Murlough SAC, however it is not a primary reason for site selection.

²⁵ <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/DAERA%20report%20-%20Strangford%20Lough%20subtidal%20Special%20Area%20of%20Conservation%20%28SAC%29%20Condition%20Assessment%202019%20-%20V2.0%20January%202022%20-%20Web.pdf>

²⁶ https://www.daera-ni.gov.uk/sites/default/files/publications/dae/Strangford%20Lough%20SAC%20Conservation%20Objectives%202018_.pdf

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- 1.6.2.22 The SAC is recognised as an important haul-out site for harbour seal with yearly maximum counts of 141 individuals. With a 25% maximum decline from the baseline values, a target to maintain a favourable condition of 106 individuals is set (DAERA, 2018b).

Condition assessment

- 1.6.2.23 There is no condition assessment available for the harbour seal feature of the Murlough SAC.

Conservation objectives

- 1.6.2.24 The conservation objectives relevant to the harbour seal feature, as outlined in DAERA (2018b)²⁷ and considered in the assessment, are set out below:
- To maintain (or restore where appropriate) the harbour seal feature to favourable condition
 - To maintain (and if feasible enhance) population numbers and distribution of harbour seal
 - To maintain and enhance, as appropriate, physical features used by harbour seal within the site.

Llyn Peninsula and the Sarnau/Pen Llŷn a'r Sarnau SAC

Site description

- 1.6.2.25 The Pen Llŷn a'r Sarnau SAC is located 119.7 km away from the Morgan Generation Assets. The Pen Llŷn a'r Sarnau SAC is located in northwest Wales and extends from Nefyn on the north coast of the Llŷn Peninsula along the Meirionnydd coast to Clarach in Ceredigion south of the Dyfi estuary (NRW, 2018a). The site covers an area of about 146,023 ha (NRW, 2018a).
- 1.6.2.26 The nature of the seabed and coast and the range of environmental conditions present vary throughout the SAC with great differences in rock and sediment type, aspect, sediment movement, exposure to tidal currents and wave action, water clarity and salinity throughout the site. This diverse environment has created a wide range of habitats and associated communities, some of which are unique to Wales (NRW, 2018a).

Feature accounts

- 1.6.2.27 Both bottlenose dolphin and grey seal are listed as Annex II species present as a qualifying feature, but neither are a primary reason for site selection. Accounts of each of the features are provided below.

Grey seal

- 1.6.2.28 The grey seal present within the SAC are thought to be a part of a wider north Wales population. Grey seal range throughout the open coast areas of the site and beyond

²⁷ <https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Murlough%20SAC%20Conservation%20Objectives%202018%20%28002%29.pdf>

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but are commonly observed within the SAC around the Llŷn Peninsula, Bardsey Island and the islands along the south Llŷn Peninsula coast (NRW, 2018a).

- 1.6.2.29 The SAC contains several important pupping sites which are located around the northwest of the SAC including Bardsey Island, with the majority of pups born from September to October, but with some pupping activity occurring from early August to the end of November (NRW, 2018a). Haul-out sites are distributed throughout the SAC and non-pupping seals are present year-round at these haul out sites. Haul out sites are predominantly located on intertidal rocky outcrops, rock and boulder/cobble beaches, sea caves that are tidally exposed, and occasionally sandy beaches and tidally exposed sandflats (NRW, 2018a).

Bottlenose dolphin

- 1.6.2.30 Bottlenose dolphin do not form a discrete site-based population within the Llyn Peninsula and the Sarnau SAC/Pen Llŷn a'r Sarnau SAC but are seen as part of a wider population that ranges across waters of southwest UK and Ireland, and includes the Cardigan Bay SAC (NRW, 2018a). Important characteristics relating to population dynamics are deemed to be common to bottlenose dolphin in both the Llyn Peninsula and the Sarnau SAC/Pen Llŷn a'r Sarnau SAC and the Cardigan Bay/Bae Ceredigion/SAC as both sites are located within Cardigan Bay. Population estimates for bottlenose dolphin of the Cardigan Bay/Bae Ceredigion SAC in the years 2001 to 2007 (obtained from mark-recapture surveys), provided an estimate of 210 individuals for Cardigan Bay SAC in 2007. A higher estimate of 379 individuals is made when calculated for the whole period 2001 to 2007 (NRW, 2018a).
- 1.6.2.31 As reported in Lohrengel *et al.* (2018), there has been an overall increase in the population size between 2001 to 2007 and a decline since then to 2001 levels but there is considerable variability between years and low confidence in some estimates (and the apparent trends are not significant). The decline in recent years may be related to animals moving away from the study area and spending the majority of their time in other parts of Wales or beyond. The population is declining in the short term (10 years), but stable in the medium term (since 2001).
- 1.6.2.32 Bottlenose dolphin are present in Welsh coastal waters year-round, with a strong peak in numbers in summer. In Cardigan Bay they are most commonly seen within 10 miles of the coast and most concentrated within two miles near headlands and estuaries. Calving has been documented within Cardigan Bay and new born/very young calves have been reported in the bay from April to September, suggesting a seasonal pattern to calving (NRW, 2018a).

Condition assessment

- 1.6.2.33 Table 1.51 outlines the indicative condition assessments of the relevant qualifying features of the Llyn Peninsula and the Sarnau/Pen Llŷn a'r Sarnau SAC. Overall, the condition assessment deemed that grey seal and bottlenose dolphin are in favourable condition although the condition of supporting habitats is currently unknown (NRW, 2022a)²⁸. There are no activities identified as having a direct impact on site condition (NRW, 2022a).

²⁸ <https://cdn.cyfoethnaturiol.cymru/media/684243/indicative-condition-assessment-2018-for-pen-llyn-ar-sarnau-sacv2.pdf>

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Table 1.51: Condition assessment of the relevant Annex II marine mammal features of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC.

Component of species feature assessed	Indicative assessment	Key evidence type used	Level of agreement	Confidence in evidence	Component confidence level
Grey seal					
Population (e.g. size, structure, production, condition of species within site, contaminant burdens)	Favourable	Reports and expert judgement	Medium	Medium	Medium
Range (within site)	Favourable	Reports and expert judgement	Medium	Medium	Medium
Bottlenose dolphin					
Population (e.g. size, structure, production, condition of species within site, contaminant burdens)	Favourable	Monitoring data, reports	Medium	Medium	Medium
Range (within site)	Favourable	Monitoring data, reports	Medium	Medium	Medium

Conservation objectives

- 1.6.2.34 The conservation objectives relevant for grey seal and bottlenose dolphin features of the Lleyn Peninsula and the Sarnau/Pen Llŷn a'r Sarnau SAC are outlined below (NRW, 2018a)²⁹.
- 1.6.2.35 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.6.4, conservation objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report (Document Reference E1.4).
- 1.6.2.36 To achieve FCS all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve FCS.

Typical species

- 1.6.2.37 The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include:

²⁹ <https://cdn.cyfoethnaturiol.cymru/media/688001/eng-pen-llyn-ar-sarnau-reg-37-report-2018.pdf>

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- Species richness
- Population structure and dynamics
- Physiological health
- Reproductive capacity
- Recruitment
- Mobility
- Range.

1.6.2.38 As part of this objective it should be noted that:

- Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
- The management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term.

Restoration and recovery

1.6.2.39 As part of this objective, it should be noted that; for the reefs feature, the potential for expansion of the horse mussel *Modiolus modiolus* community off the north Llŷn Peninsula coast should not be inhibited.

Relevant species features

- Grey seal *Halichoerus grypus*
- Bottlenose dolphin *Tursiops truncatus*.

Populations

1.6.2.40 The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:

- Population size
- Structure, production
- Condition of the species within the site.

1.6.2.41 As part of this objective, it should be noted that for bottlenose dolphin and grey seal:

- Contaminant burdens derived from human activity should be below levels that may cause physiological damage, or immune or reproductive suppression.

1.6.2.42 For grey seal, populations should not be reduced as a consequence of human activity.

1.6.2.43 Important elements include:

- Population size
- Structure
- Production
- Condition of the species within the site.

1.6.2.44 As part of this objective, it should be noted that for bottlenose dolphin and grey seal:

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- Contaminant burdens derived from human activity should be below levels that may cause physiological damage, or immune or reproductive suppression
- For grey seal, populations should not be reduced as a consequence of human activity.

Range

1.6.2.45 The species population within the site is such that the natural range of the population should not be reduced or likely to be reduced for the foreseeable future.

1.6.2.46 As part of this objective, it should be noted that for bottlenose dolphin and grey seal:

- Their range within the SAC and adjacent inter-connected areas should not be constrained or hindered
- There should be appropriate and sufficient food resources within the SAC and beyond
- The sites and amount of supporting habitat used by these species should be accessible and their extent and quality be stable or increasing.

Supporting habitats and species

1.6.2.47 The presence, abundance, condition and diversity of habitats and species required to support bottlenose dolphin and grey sea are such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include:

- Distribution
- Extent
- Structure
- Function and quality of habitat
- Prey availability and quality.

1.6.2.48 As part of this objective, it should be noted that:

- The abundance of prey species subject to existing commercial fisheries should be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
- The management and control of activities or operations likely to adversely affect the species feature should be appropriate for maintaining it in favourable condition and is secure in the long term
- Contamination of potential prey species should be below concentrations potentially harmful to their physiological health
- Disturbance by human activity should be below levels that suppress reproductive success, physiological health or long-term behaviour.

Restoration and recovery

1.6.2.49 As part of this objective, it should be noted that bottlenose dolphin populations should be increasing.

1.6.2.50 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.6.4, conservation

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objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report (Document Reference E1.4).

The Maidens SAC

Site description

- 1.6.2.51 The Maidens SAC, which is 142 km away from Morgan Generation Assets, is located in the North Channel to the northeast coast of Northern Ireland. The SAC groups small rocky reefs either awash or just emergent detached from the coast. Two rocks within the SAC can be considered islands (i.e. West Maiden and East Maiden). There are four reef areas in addition to the reef plateau between the Maiden islands. The SAC extends over 74.6 km², depths range between Mean High Water and 200 m deep and the site can experience currents of up to 4 kn.

Feature accounts

Grey seal

- 1.6.2.52 Grey seal is a qualifying feature of The Maidens SAC; however, it is not a primary reason for site selection.
- 1.6.2.53 The emergent rocks, islands and waters within the SAC are recognised as important to provide haul-out site, resting sites and foraging areas for grey seal. A maximum count of 70 individuals was recorded during a survey in July 2000. A target to maintain a favourable condition of 50 individuals is set (DAERA, 2017). Surveys in 2009 observed pupping and breeding on the site. In 2002, the SAC was one of the three regions with the largest numbers of grey seal around the coast of Northern Ireland (Northern Ireland Environment Agency (NIEA), 2012).

Condition assessment

- 1.6.2.54 There is no condition assessment available for the grey seal feature of The Maidens SAC.

Conservation objectives

- 1.6.2.55 The conservation objectives relevant to the harbour seal feature, as outlined in DAERA (2017)³⁰ and considered in the assessment, are set out below:
- To maintain (or restore where appropriate) the grey seal feature to favourable condition
 - To maintain (and if feasible enhance) population numbers and distribution of grey seal
 - To maintain and enhance, as appropriate, physical features used by grey seal within the site.

³⁰ <https://www.daera-ni.gov.uk/sites/default/files/publications/daera/The%20Maidens%20SAC%20Conservation%20Objectives%202017.PDF>

Cardigan Bay/Bae Ceredigion SAC

Site description

- 1.6.2.56 The Cardigan Bay/Bae Ceredigion SAC which is 188.1 km from the Morgan Generation Assets, is located off the north Pembrokeshire coast in the south region of Cardigan Bay. The SAC encompasses approximately 960 km² and extends 12 miles offshore. The SAC has a wide range of sediment types from well sorted highly homogenous sands to well mixed muddy gravels, pebbles and cobbles. Sediments associated with coastal areas are predominantly sands with some intrusions of gravel (NRW, 2018b). The majority of the SAC is less than 30 m deep but reaches 50 m in the outer parts of the bay towards St. George's Channel. Species interactions within the SAC are complex and inter-related with bottlenose dolphin and grey seal being the primary top predators and therefore likely to be affected by changes at lower trophic levels (NRW, 2018b).

Feature accounts

Bottlenose dolphin

- 1.6.2.57 Bottlenose dolphin are present all year round in the Cardigan Bay/Bae Ceredigion SAC, with peak numbers and group size (of more than 60 individuals) observed during September and October. Recent estimates suggest that the Cardigan Bay population is made up of around 100 to 300 individuals (NRW, 2018b). Of individuals present within the SAC, 30% have also been identified in the Pen Llyn a'r Sarnau SAC as well as to the north around the Isle of Anglesey, indicating the large home ranges of some individuals. Some individuals however show a more local residency pattern and exhibit smaller home ranges (NRW, 2018b). In coastal waters bottlenose dolphins tend to favour habitats with uneven topography and/or strong tidal currents, acoustic monitoring has also suggested the presence of reef and sandbanks for foraging. There has been high frequency of sightings along the coast from Aberaeron to Cardigan and around Fishguard which suggests these areas are of particular significance to bottlenose dolphin foraging.

Grey seal

- 1.6.2.58 Grey seal individuals present within the Cardigan Bay/Bae Ceredigion SAC do not form a discrete population; they are thought to be part of the South West England and Wales MUs. The southwest Wales population is determined from pup counts and has been estimated at around 5,000 individuals; pup production within the Cardigan Bay SAC represents a small proportion of this (NRW, 2018b). Seals are widely distributed within the site and also travel outside of the site. Small numbers of the population also make foraging trips further offshore and into the deeper waters of the Irish Sea. Most pupping occurs towards the southwest end of the SAC but takes place throughout the site at suitable locations such as undisturbed rocky beaches, coves and caves. Moulting and resting haul-out sites are also located throughout the site although seals are usually seen hauling out as individuals or in small groups rather than large groups (NRW, 2018b).
- 1.6.2.59 It should be noted that although grey seal is a designated feature of the Cardigan Bay/Bae Ceredigion SAC (as outlined in 1.6.1.3 to 1.6.1.10) in line with the iterative process this feature is not assessed fully in section 1.6.4 and 1.6.5 for this SAC as the feature is assessed in full for the Pen Llyn a'r Sarnau/Llyn Peninsula and the Sarnau, which is located at a reduced distance from the Morgan Generation Assets.

Condition assessment

1.6.2.60 Table 1.52 outlines the indicative condition assessments of the relevant qualifying features of the Cardigan Bay/Bae Ceredigion SAC. Overall the condition assessment deemed that bottlenose dolphin are in favourable condition, although the condition of supporting habitats is currently unknown (NRW, 2022b)³¹. There are no activities identified as having a direct impact on the site condition (NRW, 2022b).

Table 1.52: Condition assessment of the relevant Annex II marine mammal feature of the Cardigan Bay/Bae Ceredigion SAC.

Component of species feature assessed	Indicative assessment	Key evidence type used	Level of agreement	Confidence in evidence	Component confidence level
Bottlenose dolphin					
Population (e.g. size, structure, production, condition of species within site and contaminant burdens)	Favourable	Monitoring data, reports	Medium	High	Medium
Range (within site)	Favourable	Monitoring data, reports	Medium	Medium	Medium

Conservation objectives

1.6.2.61 The conservation objectives outlined in NRW (2018b)³² and considered in the assessment which are relevant to the bottlenose dolphin feature are outlined below.

1.6.2.62 To achieve FCS all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve FCS.

Typical species

1.6.2.63 The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include:

- Species richness
- Population structure and dynamics
- Physiological health
- Reproductive capacity
- Recruitment
- Mobility
- Range.

1.6.2.64 As part of this objective, it should be noted that:

³¹ <https://cdn.cyfoethnaturiol.cymru/media/684241/indicative-condition-assessment-2018-cardigan-bay-sacv2.pdf>

³² <https://cdn.cyfoethnaturiol.cymru/media/687993/eng-cardigan-bay-reg-37-report-2018.pdf>

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- Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
- The management and control of activities or operations likely to adversely affect the habitat feature should be appropriate for maintaining it in favourable condition and is secure in the long term.

Relevant species features

- Grey seal
- Bottlenose dolphin.

Populations

- The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:
 - Population size
 - Structure, production
 - Condition of the species within the site
- As part of this objective it should be noted that for bottlenose dolphin and grey seal:
 - Contaminant burdens derived from human activity should be below levels that may cause physiological damage, or immune or reproductive suppression
- For grey seal, populations should not be reduced as a consequence of human activity.

Range

- The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future
- As part of this objective it should be noted that for bottlenose dolphin and grey seal:
 - Their range within the SAC and adjacent inter-connected areas should be not constrained or hindered
 - There should be appropriate and sufficient food resources within the SAC and beyond
 - The sites and amount of supporting habitat used by these species should be accessible and their extent and quality, stable or increasing.

Supporting habitats and species

- The presence, abundance, condition and diversity of habitats and species required to support this species should be such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include:
 - Distribution

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- Extent
- Structure
- Function and quality of habitat
- Prey availability and quality
- As part of this objective it should be noted that:
 - The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
 - The management and control of activities or operations likely to adversely affect the species feature should be appropriate for maintaining it in favourable condition and is secure in the long term
 - Contamination of potential prey species should be below concentrations potentially harmful to their physiological health
 - Disturbance by human activity should be below levels that suppress reproductive success, physiological health or long-term behaviour.

Restoration and recovery

- As part of this objective, it should be noted that for the bottlenose dolphin populations should be increasing.

1.6.2.65 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.6.4, conservation objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 LSE Screening Report (Document Reference E1.4).

Pembrokeshire Marine/Sir Benfro Forol SAC

Site description

1.6.2.66 The Pembrokeshire Marine/Sir Benfro Forol SAC, which is 237.3 km from the Morgan Generation Assets, extends from north of Abereddy on the north Pembrokeshire coast to the east of Manorbier in the south. The SAC encompasses the coasts of the islands of Ramsey, Skomer, Grassholm, Skokholm, the Bishops and Clerks and The Smalls. The SAC overlaps wholly or in part with several other designated sites including the Skomer MCZ and several SPAs. Sediments across the site range from very fine, muds in sheltered area such as Milford Haven waterway, sands and gravels to pebbles and cobbles in deep subtidal areas which are subject stronger currents (NRW, 2018c). There are also strong tidal streams within the SAC.

Feature accounts

Grey seal

1.6.2.67 Grey seal is present as an Annex II species that is a primary reason for selection of this site.

1.6.2.68 Pembrokeshire in southwest Wales is representative of grey seal colonies in the southwest part of the breeding range in the UK. It is the largest breeding colony on the west coast, south of the Solway Firth, representing over 2% of annual UK pup production. The southwest Wales population size is determined from pup counts and

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has been estimated at approximately 5,000 individuals (Baines *et al.*, 1995). There was a steady increase in pup production from 2009 to 2015 with the greatest increase observed at the mainland sites. Although in 2014 and 2015, increases at the island sites were recorded (NRW, 2018c). Pup production from 2015 to 2018 has shown the highest totals ever recorded with average production for 2013 to 2015 at 357 pups (NRW, 2018c). Pupping primarily takes place in the southwest end of the SAC (NRW, 2018c).

1.6.2.69 Grey seal are highly mobile, and can travel great distances (SCOS, 2018; Carter *et al.*, 2022). Seals are widely distributed within the Pembrokeshire Marine/Sir Benfro Forol SAC, but also travel far beyond the boundary of the site. Moulting and resting haul-out sites are distributed throughout the site, with a small number of sites regularly used as haul-outs by large numbers of seals. Known winter moulting haul-outs and non-moulting/resting haul-outs are primarily located on offshore islands and remote, undisturbed and inaccessible rocky shores and beaches (NRW, 2018c).

Condition assessment

1.6.2.70 Table 1.53 outlines the indicative condition assessments of the relevant qualifying features of the Pembrokeshire Marine/Sir Benfro Forol SAC, overall the condition assessment deemed that grey seal are in favourable condition although the condition of supporting habitats is currently unknown (NRW, 2018d)³³. There are no activities identified as having a direct impact on the site condition (NRW, 2018d).

Table 1.53: Condition assessment of the relevant Annex II marine mammal feature of the Pembrokeshire Marine/Sir Benfro Forol SAC.

Component of species feature assessed	Indicative assessment	Key evidence type used	Level of agreement	Confidence in evidence	Component confidence level
Grey seal					
Population (e.g. size, structure, production, condition of species within site, contaminant burdens).	Favourable	Reports and expert judgement	High	Medium	Medium
Range (within site).	Favourable	Reports and expert judgement	Medium	Medium	Medium

Conservation objectives

1.6.2.71 The conservation objectives relevant to the grey seal feature, as outlined in NRW (2018c)³⁴ and considered in the assessment which are set out below:

³³ <https://cdn.cyfoethnaturiol.cymru/media/684242/indicative-condition-assessment-2018-pembrokeshire-marine-sacv2.pdf>

³⁴ <https://cdn.cyfoethnaturiol.cymru/media/687999/eng-pembrokeshire-marine-reg-37-report-2018.pdf>

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- To achieve FCS all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve FCS.

Typical species

- The presence, abundance, condition and diversity of typical species should be such that habitat quality is not degraded. Important elements include:
 - Species richness
 - Population structure and dynamics
 - Physiological health
 - Reproductive capacity
 - Recruitment
 - Mobility
 - Range
- As part of this objective it should be noted that:
 - Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum
 - Sustainable yield and secure in the long term the management and control of activities or operations likely to adversely affect the habitat feature should be appropriate for maintaining it in favourable condition and secure in the long term.

Restoration and recovery

- For the inlets and bays feature, this includes the need for some restoration of the populations of several typical species which are severely depleted with respect to historical levels as a consequence primarily of human exploitation
- In the Milford Haven waterways complex inputs of nutrients and contaminants to the water column and sediments derived from human activity must remain at or below levels at the time the site became a candidate SAC.

Relevant species features

- Grey Seal.

Populations

- The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:
 - Population size
 - Structure, production
 - Condition of the species within the site.

1.6.2.72 As part of this objective it should be noted that for grey seal:

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- Contaminant burdens derived from human activity should be below levels that may cause physiological damage, or immune or reproductive suppression.
- 1.6.2.73 For grey seal, populations should not be reduced as a consequence of human activity.

Range

- The species population within the site should be such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future
- As part of this objective it should be noted that for grey seal:
 - Their range within the SAC and adjacent inter-connected areas should not be constrained or hindered
 - There should be appropriate and sufficient food resources within the SAC and beyond
 - The sites and amount of supporting habitat used by these species should be accessible and the extent and quality, stable or increasing.

Supporting habitats and species

- The presence, abundance, condition and diversity of habitats and species required to support this species should be such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site are stable or increasing. Important considerations include:
 - Distribution
 - Extent
 - Structure
 - Function and quality of habitat
 - Prey availability and quality
- As part of this objective it should be noted that:
 - The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
 - The management and control of activities or operations likely to adversely affect the species feature should be appropriate for maintaining it in favourable condition and secure in the long term
 - Contamination of potential prey species should be below concentrations potentially harmful to their physiological health

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- Disturbance by human activity should be below levels that suppress reproductive success, physiological health or long-term behaviour.

Restoration and recovery

- In the Milford Haven waterways complex, inputs of nutrients and contaminants to the water column and sediments derived from human activity must remain at or below levels at the time the site became a candidate SAC.

1.6.2.74 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.6.4, conservation objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report (Document Reference E1.4).

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Site description

1.6.2.75 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, which is 300.5 km away from the Morgan Generation Assets, is located in English and Welsh waters, to the east of the Celtic Sea in the Bristol Channel. The SAC extends from the north coast of Cornwall in England to Carmarthen Bay in Wales and covers an area of 5,850 km². Water depths range from Mean Low Water to 70 m on the west edge of the SAC. The site is composed of diverse habitats comprising small areas of rocky reefs, sandbanks, sea caves, sand/mudflats and salt meadows but it is mostly characterised by sandy and coarse sediment seabed. Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC encompasses the Lundy SAC which has grey seal as a qualifying feature as described below.

Feature accounts

Harbour porpoise

1.6.2.76 Harbour porpoise is listed as an Annex II species present as a qualifying feature and as a primary reason for site selection.

1.6.2.77 While harbour porpoise are present year round within the boundaries of the SAC, the site provides important winter habitat for harbour porpoise with persistent higher densities throughout the site compared to other regions of the UK CIS MU (within top 10% densities of those for the CIS MU in winter) (IAMMWG, 2015). The SAC is estimated to support 4.7% of the UK CIS MU population. The SCANS-II surveys in 2005 estimated that the site supports approximately 2100 individuals (95% Confidence Interval: 805 to 5,661) for at least part of the year (JNCC, Natural England and NRW, 2016). This however cannot be considered as a site population estimate as this estimate is from a one-month survey in a single year (JNCC, Natural England and NRW, 2016) and seasonal differences are likely to occur.

Condition assessment

1.6.2.78 There is no condition assessment available for the harbour porpoise feature of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC.

Conservation objectives

- 1.6.2.79 The conservation objectives relevant to the harbour porpoise feature, as outlined in JNCC, Natural England, DAERA (2019)³⁵ and considered in the assessment, are set out below.
- To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters.
- 1.6.2.80 In the context of natural change, this will be achieved by ensuring that:
- Harbour porpoise is a viable component of the site
 - There is no significant disturbance of the species
 - Sound disturbance within an SAC from a plan/project individually or in-combination is significant if it excludes harbour porpoises from more than
 - 20% of the relevant area of the site in any given day, and
 - An average of 10% of the relevant area of the site over a season
 - The condition of supporting habitats and processes, and the availability of prey is maintained.

Lundy SAC

Site description

- 1.6.2.81 The Lundy SAC, which is 335.1 km away from Morgan Generation Assets, is located in the outer Bristol Channel off north Devon. The Lundy SAC covers an area of 30.7 km² around the small rocky island of Lundy. The site supports important granite reefs habitats that are biologically extremely rich. This SAC sits within the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC described above in paragraph 1.6.2.75.

Feature accounts

Grey seal

- 1.6.2.82 Grey seal is a qualifying feature of the Lundy SAC, however, it is not a primary reason for site selection.
- 1.6.2.83 The SAC supports an average population of year round resident grey seal between 70 and 81 (2006 to 2013) with a maximum recorded of 239 in August 2011 (JNCC, 2015a; MacDonald, 2013). Pupping was observed on the site with 19 pups recorded on average between 2006 and 2013, with a maximum of 38 recorded in 2012 (MacDonald, 2013). Grey seal from the SAC have been functionally linked to at least seven other sites along the north Cornwall and Devon coast (Chapman and Tyldesley, 2016; Sayer *et al.*, 2018) and the SAC supports an important presence of grey seal for the whole West England and Welsh MU.

Condition assessment

- 1.6.2.84 There is no condition assessment available for the grey seal feature of Lundy SAC.

³⁵ <https://data.incc.gov.uk/data/505b3bab-a974-41e5-991c-c29ef3e01c0a/BCA-ConsAdvice.pdf>

Conservation objectives

- 1.6.2.85 The conservation objectives relevant to the grey seal feature, as outlined in Natural England (2018b)³⁶ and considered in the assessment, are set out below.
- 1.6.2.86 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the FCS of its qualifying features, by maintaining or restoring:
- The extent and distribution of qualifying natural habitats and habitats of qualifying species
 - The structure and function (including typical species) of qualifying natural habitats
 - The structure and function of the habitats of qualifying species
 - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
 - The populations of qualifying species
 - The distribution of qualifying species within the site.
- 1.6.2.87 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.6.4, conservation objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.6.4.

Isles of Scilly Complex SAC

Site description

- 1.6.2.88 The Isles of Scilly Complex, which is located 464.9 km away from the Morgan Generation Assets, covers an area of 268.5 km² in the Atlantic Ocean 40 km southwest of Cornwall (England). The SAC surrounds the Isles of Scilly archipelago and supports extensive areas of intertidal and subtidal sandflats which host an exceptionally rich biodiversity. The islands are surrounded by reefs and rocky islets which provide exposed and sheltered coasts to the Atlantic currents and waves.

Feature accounts

Grey seal

- 1.6.2.89 Grey seal is a qualifying feature of the Isles of Scilly Complex SAC, however, it is not a primary reason for site selection.
- 1.6.2.90 The SAC is considered to support a significant presence of grey seal with Eastern Isles, Northern Rocks and Western Rocks as the main haul-out sites. A total of 272 to 350 resident individuals year round (JNCC, 2015b; Lambert, 2001), and a maximum of 565 individuals in October 2016 (Sayer and Witt, 2018), have been recorded. Grey seals from the site have been functionally linked to at least 16 other sites across southwest England and Wales (Sayer and Witt, 2018). The SAC grey seal population accounts for around 40% of the pups born in southwest England region (Duck, 1996)

³⁶ <http://publications.naturalengland.org.uk/publication/6356698386137088>

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with an increase from 111 to 227 pups born between 2010 and 2016 (Sayer and Witt, 2018).

Condition assessment

1.6.2.91 There is no condition assessment available for the grey seal feature of the Isles of Scilly Complex SAC.

Conservation objectives

1.6.2.92 The conservation objectives relevant to the grey seal feature, as outlined in Natural England (2018c)³⁷ and considered in the assessment, are set out below.

1.6.2.93 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the FCS of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.6.2.94 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.6.4, or have otherwise been screened out.

1.6.3 Reference populations

1.6.3.1 When considering the potential for an adverse effect on site integrity for the identified SACs with Annex II marine mammal features, in line with relevant advice from stakeholders for each qualifying feature (see Table 1.1), the reference population used for assessment is the population of the MU in which the SAC is located.

1.6.3.2 For harbour porpoise, the conservation advice for SACs states that ‘harbour porpoise in UK waters are considered part of a wider European population and the highly mobile nature of this species means that the concept of a ‘site population’ is not considered an appropriate basis for expressing conservation objectives for this species’ (NRW, 2022d). As such, the CIS MU has been applied as a reference population for all harbour porpoise SACs.

1.6.3.3 The IS MU population has been used as a reference population for bottlenose dolphin on the basis that photo-ID data strongly supports the theory that there is a single population across the IS MU. Photo-ID data has identified that individual dolphins move between the two SACs in North Wales Pen Llŷn a'r Sarnau/Lleyn Peninsula and

³⁷ <http://publications.naturalengland.org.uk/publication/6399318084812800>

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the Sarnaua nd Cardigan Bay/Bae Ceredigion) and are highly connected (Feingold and Evans, 2014; Lohrengel *et al.*, 2018; Pesante *et al.*, 2008).

1.6.3.4 The same approach is also considered appropriate for grey seal and harbour seal. Advice from stakeholders was to consider OSPAR Region III as the relevant reference population. Evidence shows that individual grey seals move between the SACs, supporting the idea that there is connectivity between Welsh SACs with a single population throughout the North West England and Wales MUs rather than distinct SAC populations. Recent telemetry studies conducted by Wright and Sinclair (2022) were then used to identify SACs within the relevant MUs (for harbour seals) and OSPAR Region III (for grey seal) with connectivity to the Morgan Generation Assets.

1.6.3.5 The reference populations used within the Appropriate Assessment in section 1.6.4 and 1.6.5 are presented within Table 1.54.

Table 1.54: Information on reference populations for Annex II marine mammal features used within the Appropriate Assessments.

Annex II marine mammal feature	Relevant MU	Abundance in MU (number of animals)
Harbour porpoise	Celtic and Irish Seas (IAMMVG, 2021)	62,517
Bottlenose dolphin	Irish Seas (IAMMVG, 2021)	293
Harbour seal	Wales, NW England, N. Ireland SMUs (Wright and Sinclair, 2022) <i>plus</i> Isle of Man (no estimate available) hereafter known as 'Harbour Seal Reference Population' (HSRP).	1,424
Grey seal	OSPAR Region III / Wales, NW England, N. Ireland, SW Scotland SMU (Wright and Sinclair, 2022), <i>plus</i> Isle of Man reference population (Howe, 2018), <i>plus</i> East Ireland and Southeast Ireland regions (Duck and Morris, 2019) hereafter known as 'Grey Seal Reference Population' (GSRP).	60,780 12,910

1.6.4 Assessment of adverse effects on site integrity alone

1.6.4.1 The following assessments of the effects of the Morgan Generation Assets alone on site integrity for sites with Annex II marine mammals features have been informed by the detailed project-specific underwater sound modelling presented in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1) and the technical assessments presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). The assessments have also drawn upon the sensitivity assessments of the relevant marine mammals detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on Adverse Effects on Integrity have been identified in light of the best scientific knowledge and all reasonable scientific doubt can be ruled out.

1.6.4.2 A full assessment of adverse effects on site integrity for the Morgan Generation Assets alone has been undertaken for all the sites listed in Table 1.50 (see paragraph 1.6.1.9). In addition, as outlined in paragraph 1.6.1.10, an iterative approach to the assessment has been followed for the remaining European sites located exclusively in Welsh, Irish

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or French waters. The assessment for these additional sites is presented for each potential impact following the full assessments for the sites listed in Table 1.50.

Injury and disturbance from elevated underwater sound during piling

- 1.6.4.3 During the construction phase, sound emissions from the piling of foundations may lead to auditory injury to and disturbance of marine mammals.
- 1.6.4.4 The assessment of LSE in the HRA Stage 1 Screening Report (Document Reference E1.4) identified that during construction and decommissioning, LSE could not be ruled out for the potential impact of injury and disturbance from elevated underwater sound during piling. This relates to the European sites and Annex II marine mammal features as listed in Table 1.49.
- 1.6.4.5 The following sections explain how this potential impact on Annex II marine mammal features of the SACs outlined in Table 1.49 have been quantified and assessed.
- 1.6.4.6 The MDS considered for the assessment of potential impacts on Annex II marine mammal features from elevated underwater sound during piling is presented in Table 1.55.

Table 1.55: Maximum design scenario considered for the assessment of potential impacts on marine mammals from injury and disturbance from elevated underwater sound during piling during the construction phase.

Phase	Maximum design scenario	Justification
Construction phase	<p>Maximum temporal scenario:</p> <p>Single piling at up to 78 locations comprising: 64 Wind Turbine Generators four-legged jacket foundations; four OSP four-legged jacket foundations; and up to 10 Gravity Base Foundations (GBP) (strengthening piles).</p> <p>Total of 114 days of piling (64 days for WTGs, 38 days for GBFs and 12 days for OSPs) estimated as follows:</p> <ul style="list-style-type: none"> • WTGs: <ul style="list-style-type: none"> – Installation of up to 64 four-legged jacket foundations (with one pile per leg) = a total of 256 piles – Each pile with a diameter of 3.8 m installed by impact piling – Maximum hammer energy of 4,400 kJ for 16 locations and 3,000 kJ for 48 locations – Average duration of up to 4.5 hours piling per pile, with a maximum of one foundation (four piles) per day = cumulative total of 64 days (64 foundations x four legs x one pile per leg x 4.5 hours duration per pile = 1,152 hours). • GBFs <ul style="list-style-type: none"> – Installation of up to 32 GBFs, up to 10 of which could require piling, leading to a maximum of 150 piles. 15 piles per GBF, each with maximum 4 m diameter – Maximum hammer energy of up to 3,000 kJ – Average duration of up to four hours per pile, leading to a maximum cumulative total of up to 600 hours of piling (10 GBFs x 15 piles x 4 hours duration per pile = 600 hours) over 38 days (limited by four piles per day). • OSP 	<p>The maximum temporal scenario was assessed on the greatest number of days on which piling could occur based on the number of piles that could be installed within a 24-hour period (four per day). Of the total of 96 WTG locations there would be a maximum of 64 jackets and the remaining 32 would be gravity bases, of which up to 10 may require piling to strengthen the foundations.</p> <p>Consecutive piling is assumed over a maximum period of 24 hours.</p> <p>For the maximum spatial scenario the largest hammer energy and maximum spacing between concurrent piling events would lead to the largest spatial extent of ensonification at any one time. The project has committed to not using the maximum hammer energy (4,400 kJ) at two concurrent locations and therefore modelling has been carried out for the following scenarios:</p> <ul style="list-style-type: none"> • 3,000 kJ • 4,400 kJ • 3,000 kJ + 3,000 kJ. <p>Minimum spacing between concurrent piling represents the highest risk of injury to marine mammals as sound from adjacent foundations could combine to</p>

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Phase	Maximum design scenario	Justification
	<ul style="list-style-type: none"> – Installation of four OSPs (one per 375 MW OSP) with four-legged jacket foundations, with three piles per leg = a total of 48 piles) – Each pile with a diameter of 3.5 m installed by impact piling – Maximum hammer energy of up to 4,400 kJ – Average duration of up to 4.5 hours piling per pile with a cumulative total of up to 216 hours; installation of OSPs over 12 days (limited by four piles per day). <p>Maximum spatial scenario:</p> <p>Concurrent piling at a maximum energy of 3,000 kJ with two vessels, at a minimum distance of 1.4 km and a maximum distance of 15 km.</p> <p>Scenarios considered were:</p> <ul style="list-style-type: none"> • Concurrent piling at 3,000kJ for two WTGs. <p>Total piling phase (foundation installation) of up to two years within a four-year construction programme.</p>	<p>produce a greater radius of effect compared to a single piling event.</p>

Measures adopted as part of the Morgan Generation Assets

1.6.4.7 Measures adopted as part of the Morgan Generation Assets which are of relevance to the assessment of potential impacts on Annex II marine mammals from elevated underwater sound are presented in Table 1.56.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.56: Measures adopted as part of the Morgan Generation Assets relevant to the assessment of European sites designated for Annex II marine mammal features from elevated underwater sound.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
<p>Development of, and adherence to, a Marine Mammal Mitigation Protocol (MMMP) which will be developed in accordance with the Outline MMMP (Document Reference J17) that requires implementation of an initiation stage of a piling soft start and ramp-up.</p>	<p>This measure will minimise the likelihood of injury from elevated underwater sound to marine mammal species in the immediate vicinity of piling operations, allowing individuals to move away from the area before sound levels reach a level at which injury may occur. Compliance with these guidelines will, in most cases, reduce the likelihood of injury to marine mammals to negligible levels.</p>	<p>MMMP secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>
<p>Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17)) which sets a maximum separation limit of 15 km for concurrent piling.</p>	<p>Commitments made around maximum separation during concurrent piling will minimise the likelihood of disturbance to marine mammal and fish species in the immediate vicinity of piling operations, by limiting the ensonified area during concurrent piling.</p> <p>Where piling occurs concurrently a maximum separation distance of 15 km is used to reduce the overall area of ensonification resulting from each of the piling activities.</p>	<p>MMMP secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>
<p>Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17)) which sets a minimum separation limit of 1.4 km for concurrent piling.</p>	<p>Commitments made around minimum separation during concurrent piling will minimise the likelihood of injury to marine mammal species in the immediate vicinity of piling operations, by limiting the spatial overlap of areas of ensonification during concurrent piling.</p> <p>Where piling occurs concurrently, a minimum separation distance of 1.4 km is used to minimise the potential for additive effects due to direct overlap of concurrent piling.</p>	<p>MMMP secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>

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Measure	Justification	How the measure will be secured
<p>Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J17)) which sets the limit on maximum hammer energy used during concurrent piling at 3,000 kJ and during the single event piling at 4,400 kJ.</p>	<p>Commitments made around concurrent piling will minimise the likelihood of injury to marine mammal species in the immediate vicinity of piling operations, by reducing the ensonified area during concurrent piling.</p>	<p>MMMP secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>
<p>Development of, and adherence to, a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J19)) that requires implementation of a mitigation hierarchy with regard to UXO clearance that follows:</p> <ul style="list-style-type: none"> • Avoid UXO • Clear UXO with low order techniques • Clear UXO with high order techniques. <p>Low order techniques or avoidance of confirmed UXO are not always possible and are dependent upon the individual situations surrounding each UXO. Inclusion of low order techniques has been considered as a clearance option.</p> <p>Where detonation of UXO using low order techniques occurs this is considered to be primary mitigation noting, however, that it is not possible to fully commit to this measure at this stage. A more detailed assessment of mitigation will be undertaken post-consent as further information becomes available to inform the Outline MMMP (Document Reference J17) included in the Outline UWSMS (Document Reference J13).</p>	<p>Low order techniques generate less underwater sound than high order techniques and therefore present a lower risk to sound-sensitive receptors such as marine mammals during UXO clearance. Noting the position statement from statutory authorities on UXO clearance (DEFRA, 2021), the option to clear UXOs with low order techniques has been considered as a potential primary mitigation measure as part of this assessment.</p> <p>Note, however, that low order techniques are not always possible and are dependent upon the individual situations surrounding each UXO and its individual condition state. Given that it is possible that high order detonation may be used, the Outline MMMP (Document Reference J17) includes mitigation to reduce the likelihood of injury from UXO clearance. Please see below.</p> <p>The Outline underwater sound management strategy (Document Reference J13) includes potential further mitigation options, should the measures in the MMMP (Document Reference J17) not reduce impacts, such that there will be no residual significant effect from the project alone. Please see below.</p>	<p>MMMP secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>
<p>Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice</p>		

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Measure	Justification	How the measure will be secured
<p>Development of, and adherence to, an Outline MMMP (Document Reference J17), as an annex to the Outline UWSMS (Document Reference J13). The Outline MMMP will present appropriate mitigation for activities that could potentially lead to injurious effects on marine mammals including: piling, UXO clearance and some types of geophysical activities. The Outline MMMP will be developed on the basis of the most recent published statutory guidance and in consultation with key stakeholders.</p> <p><u>Piling:</u> for the purpose of developing the Outline MMMP (Document Reference J17), an annex to the Outline UWSMS (Document Reference J13), a mitigation zone will be defined based on the maximum predicted injury range from the dual metric sound modelling for the maximum spatial scenario (pin piles) and across all marine mammal species. The Outline MMMP sets out the measures to apply in advance of and during piling activity including the use of:</p> <ul style="list-style-type: none"> • Marine Mammal Observers (MMOs) • Passive Acoustic Monitoring (PAM) • Acoustic Deterrent Devices (ADD) <p>Therefore following the latest JNCC guidance (JNCC, 2010a).</p> <p><u>UXO clearance:</u> Measures including visual and acoustic monitoring, the use of an ADD and soft start charges will be applied to deter animals from the mitigation zone as defined by sound modelling for the largest possible UXO following the latest JNCC guidance (JNCC, 2010b).</p> <p><u>Geophysical surveys:</u> Mitigation for injury during high resolution geophysical surveys using a sub-surface sensor from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with JNCC guidance (JNCC, 2017). Soft start is not possible for SBP equipment but will be applied for other high resolution surveys where possible. Note also, some multi-beam surveys in shallow waters (<200 m) are not subject to the development of and adherence requirements of mitigation.</p>	<p>The implementation of an approved Outline MMMP (Document Reference J17) will mitigate for the risk of physical or permanent auditory injury to marine mammals within a pre-defined 'mitigation zone' for each activity. The mitigation zone is determined considering the largest injury zone across all species for each relevant activity. The use of an approved Outline MMMP will also minimise the potential for collision risk, or potential injury to, marine mammals and other marine megafauna (e.g. basking shark and sea turtles). The Outline MMMP (Document Reference J17) will include visual and acoustic monitoring as a minimum over the defined mitigation zones to ensure animals are clear before the activity commences. Additional measures to deter animals from injury risk zones may be applied in some instances (e.g. ADDs or soft start charges).</p> <p>The MMMP will be developed on the basis of the most recent published statutory guidance and in consultation with key stakeholders.</p>	<p>MMMP secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>

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Measure	Justification	How the measure will be secured
<p>Development of, and adherence to, an UWSMS that includes consideration of Noise Abatement Systems (NAS) as part of mitigation options, which will be developed in accordance with the Outline UWSMS (Document Reference J13), will be made as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate.</p>	<p>To mitigate for the likelihood of physical or permanent auditory injury to marine mammals.</p>	<p>UWSMS secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>
<p>Development of, and adherence to, an Offshore Environmental Management Plan (EMP) with measures to minimise disturbance to marine mammals and rafting birds from transiting vessels, requiring them to:</p> <ul style="list-style-type: none"> • Not deliberately approach marine mammals as a minimum • Avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride, where appropriate and possible taking into account all technical considerations. <p>The Offshore EMP will include a commitment that the site induction processes will incorporate the principles of the Wildlife Safe (WiSe) Scheme to ensure that key personnel are aware of the need to follow the WiSe Code of Conduct. The WiSe Scheme (https://www.wisescheme.org/), which is a UK national training scheme for minimising disturbance to marine life, key measures from the scheme will reduce the disturbance of vessel transits on marine mammals and rafting birds visible at the water surface, or as otherwise agreed with the Statutory Nature Conservation Bodies (SNCBs).</p>	<p>To minimise the potential for collision risk, or potential injury to, marine mammals and megafauna.</p>	<p>The measures to minimise disturbance to marine mammals and rafting birds from transiting vessels will be included within the Offshore EMP which is secured in the deemed marine licences within the draft DCO (Document Reference C1).</p>

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Measure	Justification	How the measure will be secured
<p>Development of, and adherence to, an Offshore EMP that will include a Marine Pollution Contingency Plan (MPCP) which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.</p>	<p>To ensure that the potential for release of pollutants during construction, operations and maintenance, and decommissioning phases are minimised. These will likely include designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds. The MPCP will ensure that in the unlikely event that a pollution event occurs, that plans are in place to respond quickly and effectively to ensure any spillage is minimised and potential effects on the environment are ideally avoided or minimised.</p> <p>Implementation of these measures will ensure that accidental release of contaminants from vessels will be avoided or minimised, thus providing protection for marine life across all phases of the Morgan Generation Assets.</p>	<p>A MPCP as part of the Offshore EMP is secured within the deemed marine licences of the draft DCO (Document Reference C1).</p>
<p>Development of, and adherence to, a Decommissioning Plan in accordance with the Energy Act 2004</p> <p>A Decommissioning Programme is required under the provisions of the Energy Act 2004 and this must be approved by the Secretary of State before works commence.</p>	<p>The aim of this plan is to adhere to the existing UK legislation and guidance. Overall, this will ensure the legacy of the Morgan Generation Assets will result in the minimum amount of long-term disturbance to the environment.</p> <p>While this measure has been committed to as part of the Morgan Generation Assets, the MDS for the decommissioning phase has been considered in each of the impact assessments presented in section 1.6.4.</p>	<p>Legal obligation of the Energy Act 2004 and secured within the draft DCO (Document Reference C1).</p>

Information to support assessment

Construction phase

Injury

- 1.6.4.8 The assessment of effects on marine mammals from sound from piling considered both a maximum spatial and maximum temporal scenario for pin pile foundations. Maximum spatial scenarios assume concurrent piling of pin piles (leading to the largest area of effect at any one time) whilst maximum temporal scenarios are for single piling (leading to the greatest number of days of piling). For full details on the piling scenarios assessed, see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).
- 1.6.4.9 The maximum spatial effect was predicted for pin piles with a hammer energy of 4,400 kJ. At hammer initiation, based on SPL_{pk} thresholds, PTS may occur out to a maximum range of 130 m across all species, with the maximum range predicted for harbour porpoise (Table 1.57). Using the same metric, the maximum range of injury was predicted at 652 m at full hammer energy (although this assumes animals do not move away at the start of piling, which is unlikely).
- 1.6.4.10 The maximum temporal effect was predicted as the longest duration of piling for pin piles. Whilst the effect of PTS is considered to result in permanent injury to animals, the risk of animals being exposed to sound levels leading to auditory injury would occur during piling only. Piling will be intermittent over a two year piling phase and will occur on a maximum of up to 114 days for pin piles.
- 1.6.4.11 Measures adopted as part of the Morgan Generation Assets, in the form of an Outline MMMP (Document Reference J17), will be implemented as a result of the potential injury ranges predicted for marine mammals to reduce the risk of PTS. Such measures will include deployment of an ADD, as recommended in the JNCC guidelines (2010a), to deter animals from the area of impact.
- 1.6.4.12 For marine mammals, injury thresholds are based on both peak sound pressure levels (SPL_{pk}) (i.e. un-weighted) and marine mammal hearing-weighted cumulative sound exposure level (SEL_{cum}) as per the latest guidance (Southall *et al.*, 2019) (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement).

Table 1.57: Summary of SPL_{pk} PTS injury ranges and areas of effect for marine mammals for single pin pile installation (N/E = threshold not exceeded).

Species	Threshold (unweighted peak)	Hammer energy level	3,000 kJ Maximum hammer energy		4,400 kJ Maximum hammer energy	
			Range of effect (m)	Area of effect (km ²)	Range of effect (m)	Area of effect (km ²)
Harbour porpoise (VHF)	202 dB re 1 μ Pa (SPL_{pk})	Initiation (first strike)	130	0.05	130	0.05
		Full energy (maximum)	515	0.83	652	1.34
Bottlenose dolphin High Frequency (HF)	230 dB re 1 μ Pa (SPL_{pk})	Initiation (first strike)	N/E	N/A	N/E	N/A
		Full energy (maximum)	31	0.003	39	0.004

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Species	Threshold (unweighted peak)	Hammer energy level	3,000 kJ Maximum hammer energy		4,400 kJ Maximum hammer energy	
			Range of effect (m)	Area of effect (km ²)	Range of effect (m)	Area of effect (km ²)
Phocids (grey seal and harbour seal) Phocid Carnivores in Water (PCW)	218 dB re 1 μPa (SPL _{pk})	Initiation (first strike)	26	0.002	26	0.002
		Full energy (maximum)	103	0.03	130	0.05

Table 1.58: Summary of SEL_{cum} PTS injury ranges and areas of effect for marine mammals for pin pile installation (N/E = threshold not exceeded).

Species	Threshold (SEL weighted)	Scenario	Hammer energy	Range of effect (m)	Area of effect (km ²)
Harbour porpoise (VHF)	PTS – 155 dB re 1 μPa ² s (SEL _{cum})	Single	4,400 kJ	N/E	N/A
			3,000 kJ	N/E	N/A
		Concurrent	3,000 kJ + 3,000 kJ	N/E	N/A
			Consecutive	4,400 kJ	N/E
	3,000 kJ	N/E		N/A	
Bottlenose dolphin (HF)	PTS – 185 dB re 1 μPa ² s (SEL _{cum})	Single	4,400 kJ	N/E	N/A
			3,000 kJ	N/E	N/A
		Concurrent	3,000 kJ + 3,000 kJ	N/E	N/A
			Consecutive	4,400 kJ	N/E
	3,000 kJ	N/E		N/A	
Phocids (grey seal and harbour seal) (PCW)	PTS – 185 dB re 1 μPa ² s (SEL _{cum})	Single	4,400 kJ	N/E	N/A
			3,000 kJ	N/E	N/A
		Concurrent	3,000 kJ + 3,000 kJ	N/E	N/A
			Consecutive	4,400 kJ	N/E
	3,000 kJ	N/E		N/A	

Harbour porpoise

1.6.4.13 For harbour porpoise, with measures adopted as part of the Morgan Generation Assets applied, no animals would be affected by peak pressure (SPL_{pk}) as they are expected to move away at first strike (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). Similarly, cumulative exposure (SEL_{cum}) is not expected to result in injury to any individuals. Even without the use of an ADD, the modelling predicted that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure leading to injury could be experienced out to 130 m (at hammer initiation) and 652 m (at full hammer).

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- 1.6.4.14 The range of effect is predicted to be localised to within the Morgan Array Area and therefore there is no potential for spatial overlap with the North Anglesey Marine SAC Gogledd Môn Forol – the closest site designated for harbour porpoise – which is located 28.2 km from the Morgan Array Area.
- 1.6.4.15 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) shows that the use of an ADD reduced the maximum injury zones (based on the SEL_{cum} metric at pin piles with respect to harbour porpoise).
- 1.6.4.16 Activation of an ADD for 30 minutes prior to commencement of piling of pin piles reduced the likelihood of PTS to a level not exceeding the injury thresholds during single, concurrent and consecutive piling for harbour porpoise, with no residual risk of injury during piling.

Bottlenose dolphin

- 1.6.4.17 For bottlenose dolphin, with measures adopted as part of the Morgan Generation Assets applied, it is predicted that no animals would be affected by peak pressure (SPL_{pk}) as they are expected to move away at first strike. Similarly, cumulative exposure (SEL_{cum}) is not likely to result in injury to any individuals (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)).
- 1.6.4.18 Even without the use of an ADD, the modelling predicted that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure leading to injury would be experienced out to 39 m (at full hammer energy) (the threshold was not exceeded at first strike hammer energy). Since injury will be fully mitigated via measures adopted as part of the Morgan Generation Assets there is no residual risk of injury.

Grey seal and harbour seal

- 1.6.4.19 For grey seal and harbour seal, with measures adopted as part of the Morgan Generation Assets applied, it is predicted that no animals would be affected by peak pressure (SPL_{pk}) as they are expected to move away at first strike. Similarly, cumulative exposure (SEL_{cum}) is not likely to result in injury to any individuals.
- 1.6.4.20 Even without the use of an ADD, the modelling predicted that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure leading to injury could be experienced out to 26 m (at first strike) and 130 m (at full hammer). Since injury will be fully mitigated via measures adopted as part of the Morgan Generation Assets there is no residual risk of injury during piling.

Disturbance

- 1.6.4.21 Modelled disturbance impact ranges during piling are predicted to extend across the northern part of the Irish Sea. However, the predicted extent of the contours are likely to be an overestimate as the approach assumes that the sound from piling maintains its impulsive characteristics at large distances, which is considered unlikely to be the case (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). It is noted that there is no agreed approach to modelling the cross-over point from impulsive to continuous sound and this is an ongoing active area of research (see paragraphs 1.5.5.26 to 1.5.5.29 of Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference: F3.3.1) for detailed discussion). For this reason, the potential number of animals disturbed should be interpreted with caution and subject to the caveats highlighted by Southall *et al.* (2021) with respect to environmental context (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference

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F2.4). The estimated numbers of animals predicted to experience potential disturbance as a result of different piling scenarios are presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), with conservative disturbance estimates summarised below for each relevant Annex II marine mammal feature.

- 1.6.4.22 An unweighted sound threshold of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} (or a VHF-weighted sound threshold of 103 dB re 1 μPa SPL_{rms}) (Brandt *et al.* 2018; Heinis *et al.* 2019) for harbour porpoise was recommended in NRW's position statement on assessing behavioural disturbance of harbour porpoise from underwater sound (NRW, 2023). This approach was presented to the Marine Mammal EWG and agreed by both Natural England and NRW. In particular, the fixed sound threshold is relevant to the HRA as an area-based approach and in this respect is similar to the Natural England and JNCC guidance on the use of EDRs which have also been applied to the assessment in reference to harbour porpoise SACs only. For more information on the 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} threshold see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). The derived threshold presented by Tougaard *et al.* (2021) was reported for harbour porpoise and there are limited studies to support the derivation of similar thresholds for other marine mammal species.
- 1.6.4.23 Therefore, for all other marine mammal species considered in this HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2), the NMFS level-B harassment threshold of 160 dB re 1 μPa SPL_{rms} has been applied for area-based assessment of piling (NMFS, 2005), alongside the relevant EDR. For more information on the 160 dB re 1 μPa (rms) threshold see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference Number F2.4).
- 1.6.4.24 Contours for the unweighted sound threshold of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} are presented for the west (W) location (Figure 1.6), north (N) location (Figure 1.7) and for the east (E) location (Figure 1.8).

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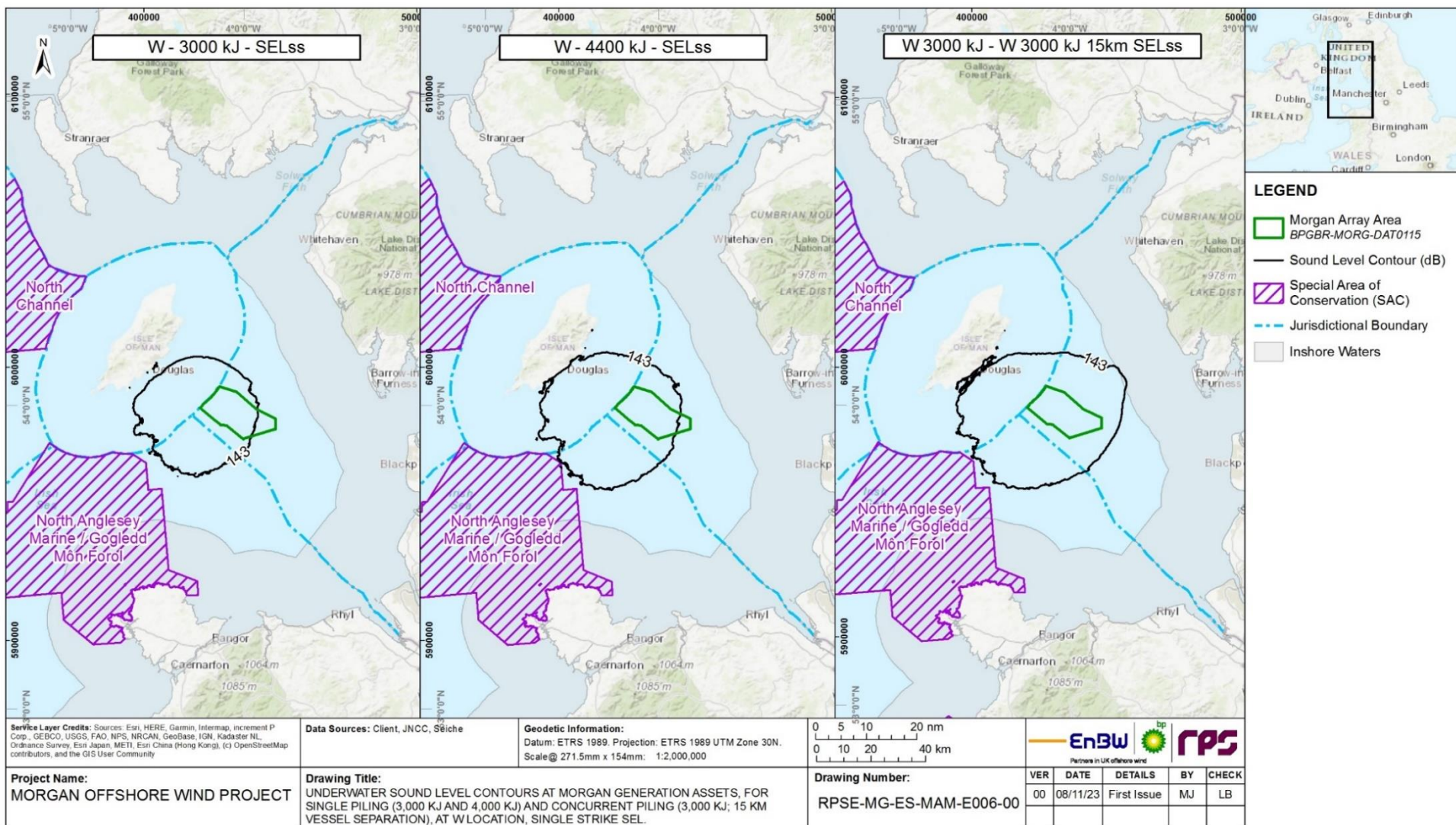


Figure 1.6: Unweighted sound threshold of 143 dB re 1µPa²s single strike sound exposure level (SEL_{ss}) for single and concurrent piling scenarios and the closest SACs (at W location).

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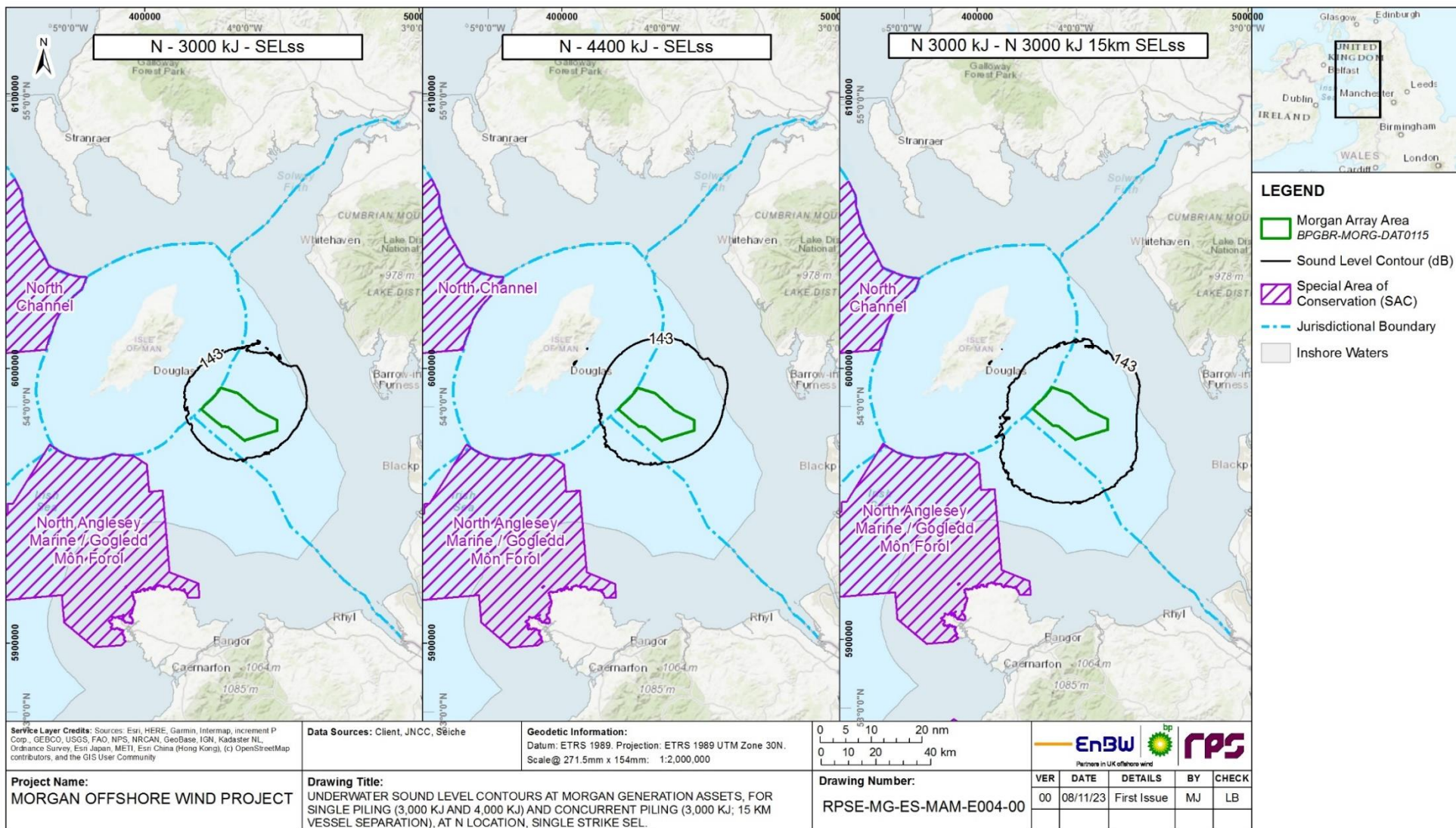


Figure 1.7: Unweighted sound threshold of 143 dB re 1µPa²s single strike sound exposure level (SEL_{SS}) for single and concurrent piling scenarios and the closest SACs (at N location).

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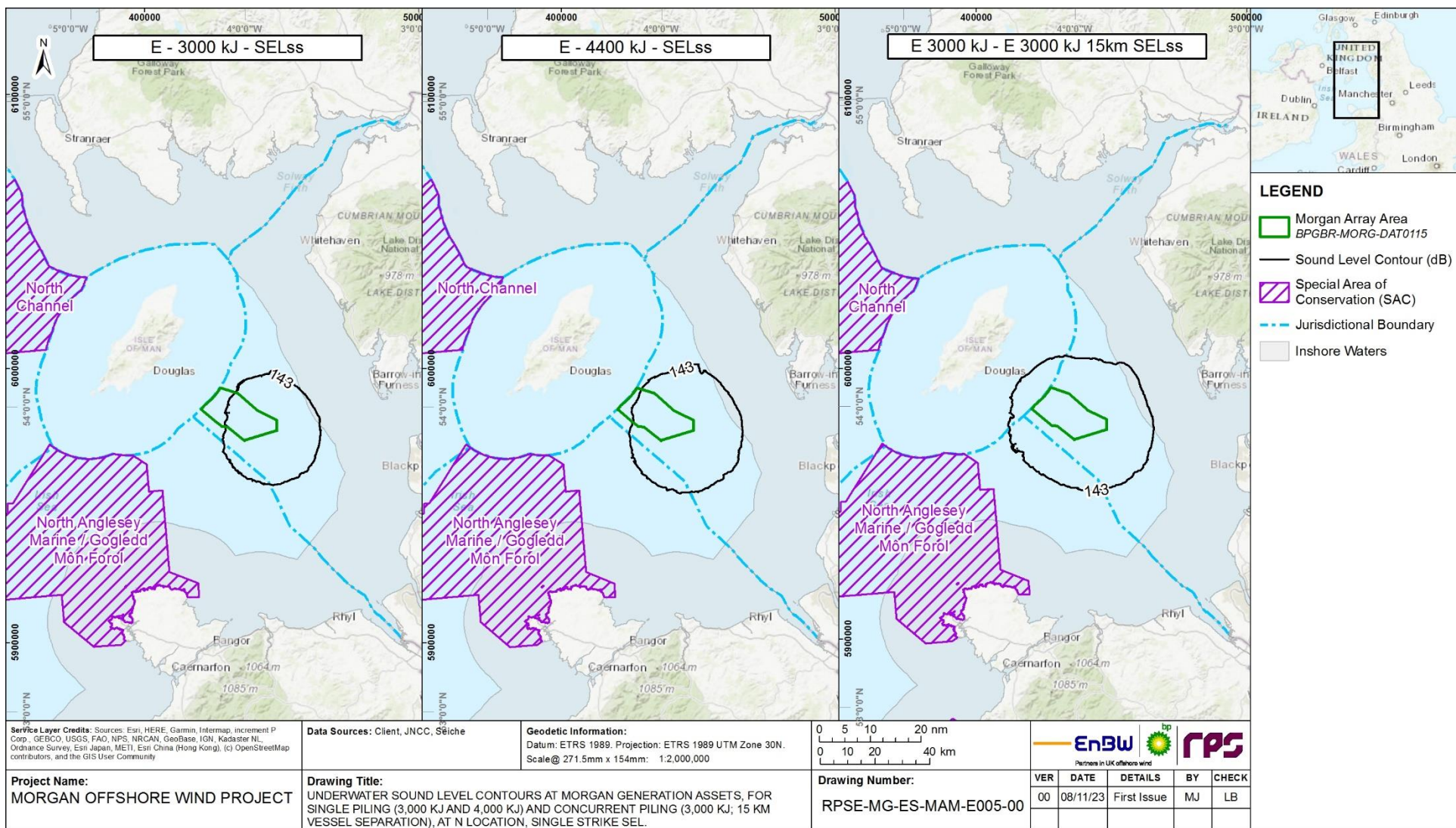


Figure 1.8: Unweighted sound threshold of 143 dB re 1µPa²s single strike sound exposure level (SEL_{SS}) for single and concurrent piling scenarios and the closest SACs (at E location).

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Harbour porpoise

- 1.6.4.25 Using the unweighted sound threshold value of 143 dB re 1 μ Pa²s SEL_{SS}, due to proximity to the SAC, single piling with a hammer energy of 4,400 kJ at the west location was the only scenario that resulted in an overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (0.002% of the total SAC area).
- 1.6.4.26 The EIA (which applied a dose response approach) found that 1,007 animals could potentially be disturbed within weighted SEL_{SS} sound contours. This equates to 1.61% of the CIS MU, however, impacted animals cannot be attributed or allocated to one individual SAC within the Morgan marine mammal study area. While animals cannot be apportioned to the SAC directly, it is estimated that less than one animal from the North Anglesey Marine/Gogledd Môn Forol SAC could potentially be disturbed within the 143 dB re 1 μ Pa²s SEL_{SS} sound threshold.

Bottlenose dolphin

- 1.6.4.27 There was no overlap of either the 160 dB re 1 μ Pa SPL_{rms} (strong disturbance) or 140 dB re 1 μ Pa SPL_{rms} (mild disturbance) contour with any SAC designated for bottlenose dolphin. The modelled contours for the thresholds of 160 dB re 1 μ Pa SPL_{rms} and 140 dB re 1 μ Pa SPL_{rms} are illustrated in (see Figure 1.9) and show that strong disturbance would not occur in coastal habitats. The area-based modelled contours for mild disturbance (140 dB re 1 μ Pa SPL_{rms}) do, however, extend further and could overlap coastal habitats. According to the behavioural response severity matrix suggested by Southall *et al.* (2021) such low level disturbance (scoring between 0 to 3 on a 0 to 9 scale) could lead to mild disruptions of normal behaviours, but prolonged or sustained behavioural effects, including displacement are unlikely to occur.
- 1.6.4.28 The EIA found that the most conservative estimate of disturbance (applying a dose-response approach) led to up to five animals (1.57% of the IS MU) predicted to experience potential disturbance from concurrent piling at a maximum hammer energy of 3,000 kJ. However, numbers of animals cannot be attributed or allocated to one individual SAC within the Morgan marine mammal study area. Whilst there is no direct overlap with any designated SAC in the Morgan marine mammal study area, animals from the IS MU may potentially be disturbed.
- 1.6.4.29 This is a conservative estimate using a single density derived for the Morgan Array Area from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) across the Irish Sea and assumes a uniform distribution throughout the area.

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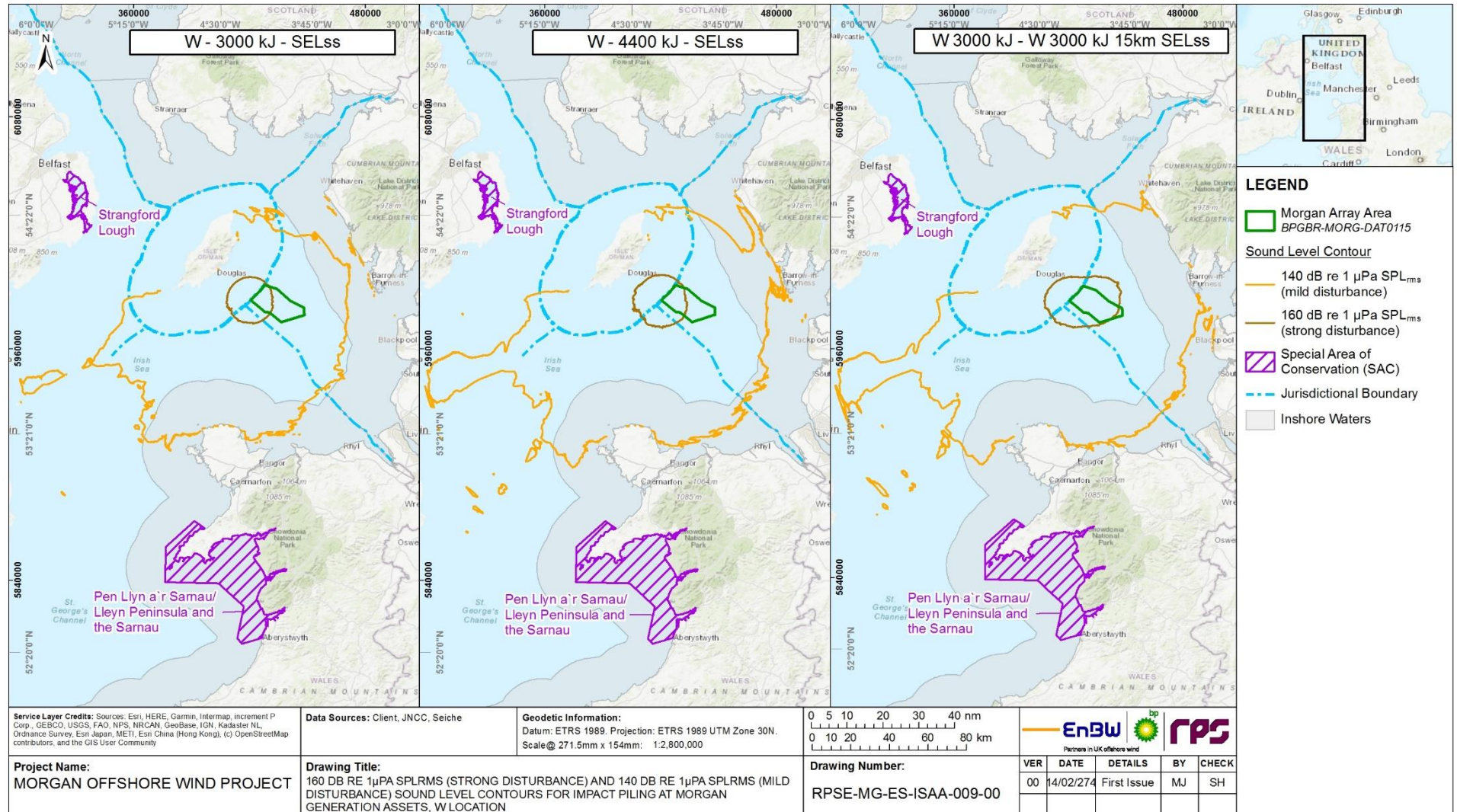


Figure 1.9: Thresholds of 160 dB re 1 μ Pa SPL_{rms} (strong disturbance) and 140 dB re 1 μ Pa SPL_{rms} (mild disturbance) for single and concurrent piling scenarios (at west location, the area with maximum extent of ensonification at these thresholds) and the closest SACs designated for bottlenose dolphin, grey seal and harbour seal.

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Grey seal

1.6.4.30 There was no overlap of either the 160 dB re 1 μ Pa SPL_{rms} (strong disturbance) or 140 dB re 1 μ Pa SPL_{rms} (mild disturbance) contour with any SAC designated for grey seal in the Morgan marine mammal study area (see Figure 1.9). As described in paragraph 1.6.4.27, strong disturbance would not occur in coastal habitats. Whilst mild disturbance contours could overlap with coastal habitats, such low level disturbance is not likely to result in prolonged or sustained behavioural effects, including displacement.

1.6.4.31 The EIA found that the most conservative estimate of disturbance (applying a dose-response approach) led to 61 animals (Carter *et al.*, 2022 densities) predicted to experience potential disturbance from concurrent piling of pin piles at a maximum hammer energy of 3,000 kJ and 3,000 kJ. This equates to 0.10 % of OSPAR Region III reference population (or 0.47 % of the GSRP), but numbers of animals cannot be attributed or allocated to one individual SAC within the Morgan marine mammal study area.

Harbour seal

1.6.4.32 There was no overlap of either the 160 dB re 1 μ Pa SPL_{rms} (strong disturbance) or 140 dB re 1 μ Pa SPL_{rms} (mild disturbance) contour with any SAC designated for harbour seal in the Morgan marine mammal study area (see Figure 1.9). As described in paragraph 1.6.4.27, strong disturbance would not occur in coastal habitats. Whilst mild disturbance contours could overlap with coastal habitats, such low level disturbance is not likely to result in prolonged or sustained behavioural effects, including displacement.

1.6.4.33 The EIA found that the most conservative estimate of disturbance (applying a dose-response approach) led to up to one animal (Carter *et al.*, 2022 densities) predicted to experience potential disturbance from concurrent piling of pin piles at a maximum hammer energy of 3,000 kJ. This equates to 0.006% of HSRP, but numbers of animals cannot be attributed or allocated to one individual SAC within the Morgan marine mammal study area.

Further measures

1.6.4.34 The project alone assessment of injury and disturbance from elevated underwater sound during piling concluded no significant impact in EIA terms Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). However, recognising the potential contribution to elevated underwater sound in the Morgan regional marine mammal study area, the Applicant has committed to the development of an Outline UWSMS (Document Reference J13) to reduce any significant impacts to non-significant levels, on the basis of a refined project envelope and programme.

1.6.4.35 The Outline UWSMS (Document Reference J13) will review appropriate measures (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) to reduce the magnitude for the project alone. The Final UWSMS will be developed and agreed with stakeholders post-consent.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

Injury

- 1.6.4.36 As outlined in paragraph 1.6.4.25 for pin piles, with measures adopted as part of the Morgan Generation Assets applied, no animals would be affected by peak pressure (SPL_{pk}) as they are anticipated to move away at first strike and no animals would be injured (SEL_{cum}). Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) concluded that the range of effect for injury would be localised to within the Morgan Array Area and there is no potential for spatial overlap with the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.4.37 Therefore, no residual animals were required to be incorporated in the iPCoD modelling assessment alongside disturbance to understand the implications of the above findings at a population level. The model demonstrated that there would be no long-term effect on the population from underwater sound related injury (see Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)).

Disturbance

- 1.6.4.38 In line with guidance from stakeholders (JNCC, and Natural England) the EDR approach has been used alongside the unweighted sound threshold value of 143 dB re $1\mu Pa^2s$ SEL_{ss} for the assessment of disturbance associated with pin pile driving during the construction phase for harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC. The EDR approach, as outlined in JNCC (2020), recommends the use of 15 km deterrence range for pin piles with and without sound mitigation at source, which is informed by studies from Graham *et al.* (2019).
- 1.6.4.39 The implementation of a 15 km EDR would rule out potential disturbance to harbour porpoise features of all SACs screened into the ISAA. Figure 1.10 shows that there is no potential overlap between the 15 km EDR and the North Anglesey Marine/Gogledd Môn Forol SAC. The assessment considered piling at the closest location within the Morgan Array Area to the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.4.40 In parallel with the EDR approach, an unweighted sound threshold value of 14 dB re $1\mu Pa^2s$ SEL_{ss} (Tougaard, 2021) as set out in NRW's 'Position on assessing behavioural disturbance of harbour porpoise from underwater noise' (NRW, 2023) has also been applied, in line with guidance from stakeholders (JNCC, NRW and Natural England). As shown in Figure 1.8, the use of an unweighted 143 dB SEL_{ss} sound threshold shows an overlap of 0.002% of the total North Anglesey Marine/Gogledd Môn Forol SAC area for the west piling location (single piling of 4,400 kJ), which is below the daily 20% guidance threshold from JNCC (2020). In terms of disturbance across the site averaged over the season (summer, 183 days), a daily footprint of 0.06 km², over 114 days of piling across the construction phase (see Table 1.59) would result in an average of 0.01% of the relevant area of the SAC being affected over the season. This therefore falls well below the threshold of 10% of the relevant area of the site over the season. This approach is highly precautionary, as not all foundations will be piled at the maximum hammer energy (as per the MDS of 16 foundations at 4,400 kJ, 48 foundations at 3,000 kJ, see Table 1.55), and assumes no concurrent piling of foundations.

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1.6.4.41 It is therefore considered that no significant disturbance of harbour porpoise within the North Anglesey Marine/Gogledd Môn Forol SAC would result from the Morgan Generation Assets alone.

Table 1.59: Disturbance thresholds for the North Anglesey Marine/Gogledd Môn Forol SAC.

Guidance threshold	Justification
20% of the relevant area ³⁸ of the site in any given day.	Using EDRs, there is no overlap between the 15 km EDR and North Anglesey Marine/Gogledd Môn Forol SAC. However, using the unweighted 143 dB re 1 µPa SEL _{ss} sound threshold, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 0.06 km ² (for a single piling activity on any given day), which equates to 0.002% of the relevant area of the site.
An average of 10% of the relevant area of the site over the season.	A daily footprint of 0.06 km ² over 114 days of piling across the construction phase would result in an average of 0.01% of the relevant area of the SAC over the season (summer, 183 days) ³⁹ .

³⁸ The relevant area is defined as that part of the SAC that was designated on the basis of higher persistent densities for that season (the North Anglesey Marine/Gogledd Môn Forol SAC is designated for the summer season which is defined as April to September inclusive). The SAC covers an area of 3,248.03km² which is used as the relevant area to inform the calculations.

³⁹ A daily footprint of 4.33% for 114 days would result in an average of 4.33x114/183 days (summer) = 2.69%

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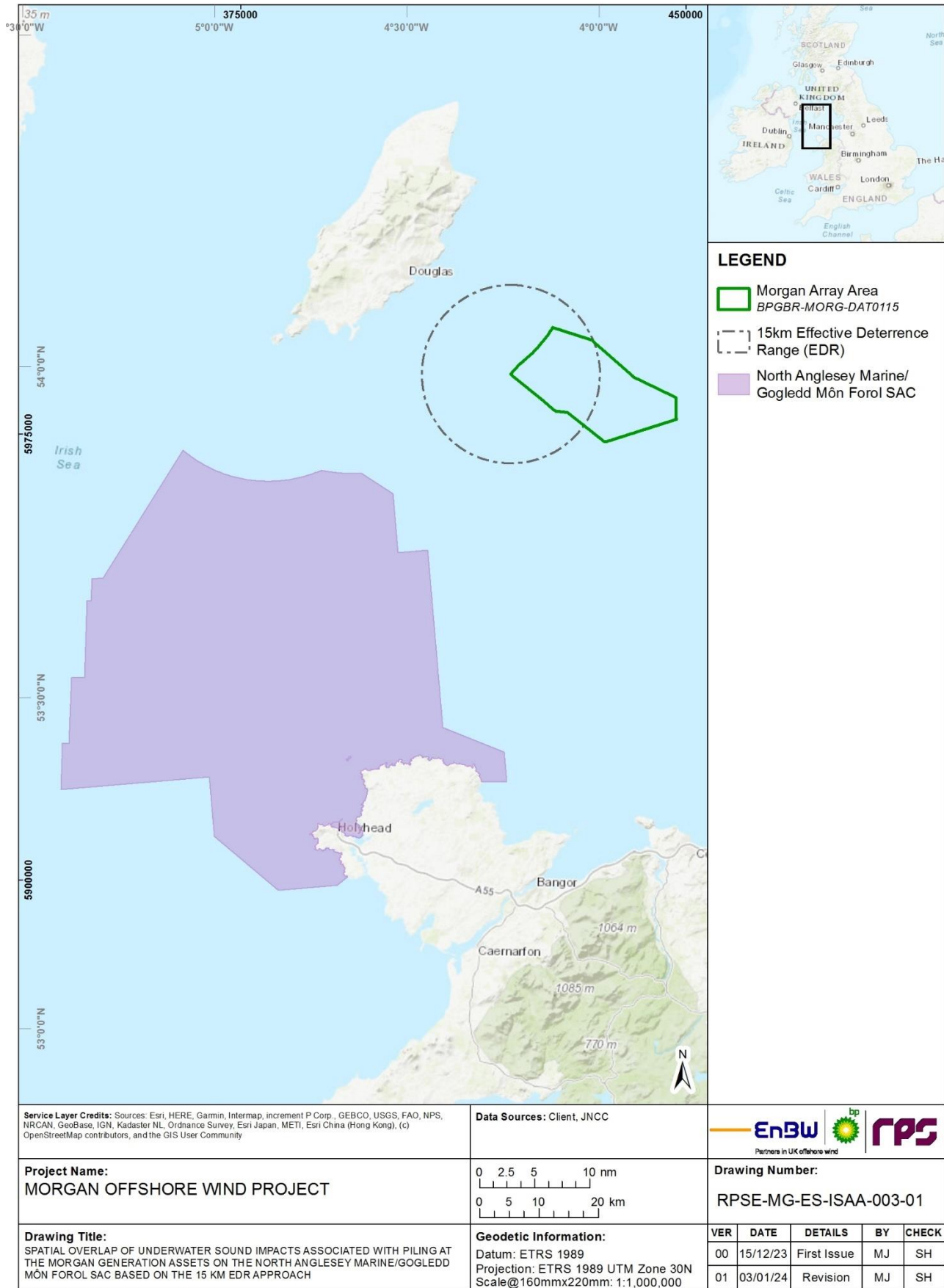


Figure 1.10: Spatial overlap of underwater sound impacts associated with piling at the Morgan Generation Assets on the North Anglesey Marine/Gogledd Môn Forol SAC based on the 15 km EDR approach.

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Conclusions

1.6.4.42 It is concluded that no adverse effects on the harbour porpoise features which could undermine the conservation objectives of the North West Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact of elevated underwater sound during pin piling against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is presented in Table 1.60. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.60: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound from piling during the construction phase.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p>	<p>For harbour porpoise, as outlined in paragraph 1.6.4.25, with measures adopted as part of the Morgan Generation Assets as detailed in Table 1.56) applied, there is predicted to be no residual risk of injury during piling activities associated with the construction phase. In addition, measures adopted as part of the Morgan Generation Assets, in the form of an Outline MMMP (Document Reference J17) (An annex of the UWSMS), will reduce the number of individuals potentially affected further as harbour porpoise features will be deterred beyond the predicted injury ranges.</p> <p>As outlined in paragraph 1.6.4.38, the maximum area of disturbance, based on the 15 km EDR for pin piles (JNCC, 2020) does not overlap the North Anglesey Marine/Gogledd Môn Forol SAC. The unweighted sound threshold value of 143 dB SEL_{ss} demonstrates a daily overlap of 0.002% with the North Anglesey Marine/ /Gogledd Môn Forol SAC, however this does not exceed the disturbance thresholds presented in Table 1.59.</p> <p>Elevated underwater sound associated with piling is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of its natural habitat over the long-term.</p>
<p>There is no significant disturbance of the species.</p>	<p>As outlined in paragraph 1.6.4.38, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 0.06 km² (for a single piling activity on any given day) which does not surpass either of the thresholds for significant disturbance. Elevated underwater sound associated with piling is therefore not predicted to restrict the objective of no significant disturbance of the species within the site.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by elevated underwater sound. With respect to prey species, some short-term disturbance is predicted to potential prey fish species, such as herring and cod spawning grounds (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). However, harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species, with the ability to exploit other food sources. Effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p>

1.6.4.43 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

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North Channel SAC

Harbour porpoise

Injury

1.6.4.44 The North Channel SAC is located further away from the Morgan Generation Assets (64.0 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.6.4.36 to 1.6.4.43. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC it is considered that effects would be of similar if not lower magnitude (i.e. no more than one individual affected by PTS).

Disturbance

1.6.4.45 The North Channel SAC is located 64.0 km from the Morgan Array Area, which is beyond the 15 km EDR outlined in JNCC (2020) and the unweighted sound threshold of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss}. There is therefore no spatial overlap with the North Channel SAC, and the thresholds for significant disturbance, as outlined in Table 1.59, would not be exceeded.

Conclusions

1.6.4.46 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of the SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.61.

Table 1.61: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound from piling during the construction phase.

Conservation objective	Conclusion
<p>The species is a viable component of the site.</p>	<p>For harbour porpoise, as outlined in paragraph 1.6.4.25, with measures adopted as part of the Morgan Generation Assets (as detailed in Table 1.56) applied, there is predicted to be no residual risk of injury during piling activities associated with the construction phase. In addition, measures adopted as part of the Morgan Generation Assets, in the form of An Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraphs 1.6.4.34 and 1.6.4.35 which will reduce the number of individuals potentially affected further as harbour porpoise features will be deterred beyond the predicted injury ranges.</p> <p>The North Channel SAC is located 64 km from the Morgan Array Area, which is beyond the 15 km EDR outlined in JNCC (2020) for pin piles and the unweighted sound threshold value of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss}. There is therefore no spatial overlap with the North Channel SAC, the thresholds for significant disturbance as outlined in Table 1.59 would not be exceeded. Elevated underwater sound during piling is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of its natural habitat over the long-term.</p>
<p>There is no significant disturbance of the species.</p>	<p>The North Channel SAC is located 64 km from the Morgan Array Area, which is outside the 15 km EDR for pin piles outlined in JNCC (2020). There is therefore no spatial overlap with the North Channel SAC, the thresholds for significant disturbance as outlined in Table 1.59 would not be exceeded. Elevated underwater sound during piling is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of its natural habitat over the long-term.</p>

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Conservation objective	Conclusion
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by elevated underwater sound. With respect to prey species, some short-term disturbance is predicted to potential prey fish species such as herring and cod spawning grounds (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). However, harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species, with the ability to exploit other food sources. Effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.6.4.47 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Strangford Lough SAC

Harbour seal

Injury

1.6.4.48 For harbour seal, with measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), no animals would be affected by peak pressure (SPL_{pk}) as they they are anticipated to move away at first strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals.

Disturbance

1.6.4.49 As outlined in paragraph 1.6.4.32, for harbour seal, there was no overlap of the 160 dB SPL_{rms} (strong disturbance) contour with any SAC designated for harbour seal in the Morgan marine mammal study area.

1.6.4.50 The most conservative estimate of disturbance using the 160 dB re 1 μPa SPL_{rms} (strong disturbance) threshold led to up to less than one animal potentially being disturbed which equates to 0.006% of the HSRP (Table 1.54). Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) concluded that the impact could also result in a very small effect on the distribution of harbour seal during piling only and may affect the fecundity of very small numbers in the context of the reference population over the medium term. However, due to the very small numbers and small proportion of the population affected the magnitude of the impact is unlikely to lead to a population-level effect and this species was not carried forward for further assessment within the iPCoD model framework.

Conclusions

1.6.4.51 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraph 1.6.2.19) is discussed Table 1.62 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.62: Conclusions against the conservation objectives of the Strangford Lough SAC for elevated underwater sound from piling during the construction phase.

Conservation objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition.</p> <p>To restore and maintain (and if feasible enhance) population numbers and distribution of harbour seal.</p>	<p>For harbour seal, with measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no residual risk of injury during piling. In addition, measures adopted as part of the Morgan Generation Assets, in the form of an Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraphs 1.6.4.34 and 1.6.4.35 will reduce the number of individuals affected further as harbour seal features will be deterred beyond the predicted injury ranges.</p> <p>There was no overlap of the 160 dB re 1 μPa SPL_{rms} (strong disturbance) contour with any SAC designated for harbour seal in the Morgan marine mammal study area.</p> <p>For harbour seal, the most conservative estimate of disturbance using the unweighted sound threshold of 160 dB rms led to less than one animal predicted to experience potential disturbance which equates to 0.01% of the HSRP (Table 1.54).</p> <p>This could potentially result in a very small effect on harbour seal distribution and fecundity (less than one animal potentially being disturbed) during piling only, in the context of the reference population over the medium term. In addition, due to the very small numbers and small proportion of the population affected the impact is not considered to lead to a population-level effect.</p> <p>In addition, the maximum temporal scenario for piling at the Morgan Generation Assets is for up to 114 days of piling over the two year construction period meaning this impact will not be continuous over the whole duration of the construction period.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. On the basis of the above, elevated underwater sound during piling associated with the Morgan Generation Assets will also not prevent the harbour seal population numbers and distribution from being maintained or enhanced in the long term.</p>
<p>Restore, maintain and enhance, as appropriate, physical features used by harbour seal within the site.</p>	<p>There is no pathway for elevated underwater sound during piling to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

1.6.4.52 Therefore, it can be concluded beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Murlough SAC

Harbour seal

1.6.4.53 The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC (94.7 km from the Morgan Array Area, and assessed in paragraphs 1.6.4.48 to 1.6.4.52). As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not

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lower magnitude (i.e. with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), there is no residual risk of injury during piling).

Conclusions

1.6.4.54 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraph 1.6.2.24) is discussed in Table 1.63. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.63: Conclusions against the conservation objectives of the Murlough SAC for elevated underwater sound from piling during the construction phase

Conservation objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition.</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal.</p>	<p>For harbour seal, with measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no residual risk of injury during piling. In addition, measures adopted as part of the Morgan Generation Assets in the form of an Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraph 1.6.4.34 and 1.6.4.35 which will reduce the number of individuals affected further as harbour seal features will be deterred beyond the predicted injury ranges.</p> <p>There was no overlap of the 160 dB rms (strong disturbance) contour with any SAC designated for harbour seal in the Morgan marine mammal study area.</p> <p>For harbour seal, the most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to less than one animal predicted to experience potential disturbance which equates to 0.01% of the HSRP (Table 1.54). This could potentially result in a very small effect on harbour seal distribution and fecundity (less than one animal potentially being disturbed) during piling only, in the context of the reference population over the medium term. In addition, due to the very small numbers and small proportion of the population affected the impact is not considered to lead to a population-level effect.</p> <p>In addition, the maximum temporal scenario for piling at the Morgan Generation Assets is for up to 114 days of piling over the two year construction period meaning this impact will not be continuous over the whole duration of the construction period.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. On the basis of the above, elevated underwater sound during piling associated with the Morgan Generation Assets will also not prevent the harbour seal population numbers and distribution from being maintained or enhanced in the long term.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site.</p>	<p>There is no pathway for elevated underwater sound during piling to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

1.6.4.55 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC

Bottlenose dolphin

Injury

- 1.6.4.56 As outlined in paragraph 1.6.4.17 for bottlenose dolphin, with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), there is no residual risk of injury during piling.

Disturbance

- 1.6.4.57 As outlined in paragraph 1.6.4.27, there was no overlap of either the 160 dB re 1 μ Pa SPL_{rms} (strong disturbance) or 140 dB re 1 μ Pa SPL_{rms} (mild disturbance) contour with any SAC designated for bottlenose dolphin in the Morgan marine mammal study area.
- 1.6.4.58 The EIA found that the most conservative estimate of disturbance (applying a dose-response approach) led to up to five animals predicted to experience potential disturbance from concurrent piling at a maximum hammer energy of 3,000 kJ. This equates to 1.57% of the IS MU, but numbers of animals cannot be attributed or allocated to one individual SAC within the Morgan marine mammal study area.
- 1.6.4.59 Population modelling was carried out to explore the potential of disturbance during piling to affect the population trajectory over time and provide additional certainty in the predictions of the assessment of potential effects. This is presented in full in in Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), Results of the iPCoD modelling for bottlenose dolphin against the MU population showed that the difference between the impacted and unimpacted populations after 25 years was a maximum of one animal (approximately 0.341% of the IS MU population estimate) for both the maximum temporal and maximum spatial scenarios, for both fertility rates. This difference, of one animal, was the maximum difference between the impacted and unimpacted populations throughout the 25 year simulation, for both the maximum temporal and maximum spatial scenarios, for both fertility rates.
- 1.6.4.60 Small differences (i.e. a maximum of one animal for any scenario) in the population size over time between the impacted and unimpacted population fall within the natural variance of the population and would not be expected to change the population trajectory. Therefore, given the scale of differences between impacted and unimpacted populations it was considered that there is no potential for a long-term effect on this species from elevated underwater sound during piling. It is important to highlight that whilst any model is sensitive to input parameters (as evidenced in Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the parameters (recommended by NRW through the Evidence Plan Process) used in the iPCoD model represent a conservative assessment of population changes.

Grey Seal

Injury

- 1.6.4.61 As outlined in paragraph 1.6.4.19, for grey seal, with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), no animals would be affected by peak pressure (SPL_{pk}) as they they are anticipated to move away at first

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strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals.

Disturbance

- 1.6.4.62 As outlined in paragraph 1.6.4.30 for grey seal, there was no overlap of either the 160 dB re 1 μ Pa SPL_{rms} (strong disturbance) or 140 dB re 1 μ Pa SPL_{rms} (mild disturbance) contour with any SAC designated for grey seal in the Morgan marine mammal study area.
- 1.6.4.63 The EIA found that the most conservative estimate of disturbance (applying a dose-response approach) led to up to 61 animals (Carter *et al.*, 2022 densities) predicted to experience potential disturbance from concurrent piling of pin piles at a maximum hammer energy of 3,000 kJ and 3,000 kJ (at the west location). This equates to 0.10% of the OSPAR Region III region (or 0.47% of the GSRP), but numbers of animals cannot be attributed or allocated to one individual SAC within the Morgan marine mammal study area.
- 1.6.4.64 The potential for barrier effects (i.e. the ability to move between key areas such as haul-out sites and foraging areas offshore) was considered for both concurrent and single piling scenarios. Volume 2, Chapter 4: Marine mammals considered that grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects, (i.e. preventing animals from using the foraging grounds in waters along the coast) as animals are unlikely to be excluded from the coastal areas. Furthermore, grey seal has a large foraging range (up 448 km reported in Carter *et al.*, 2022) and could therefore move to alternative foraging grounds during piling. Animals would, however, be likely to avoid offshore areas where received levels during piling exceed thresholds for strong disturbance. In addition, there may be an energetic cost associated with longer foraging trips and alternative habitat may be sub-optimal in terms of abundance of key prey species.
- 1.6.4.65 Results of the iPCoD modelling in the EIA for grey seal showed that the median of the ratio of the impacted population to the unimpacted population (when using both the GSRP and OSPAR Region III) was 1 at both six years and 25 years post the start of piling and simulated grey seal population sizes for both baseline (unimpacted) and impacted populations showed no difference. Therefore, it was considered that there is no potential for long-term effects on this species. Further information on the iPCoD modelling is provided in Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).

Conclusions

- 1.6.4.66 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.64 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.64: Conclusions against the conservation objectives of the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC for elevated underwater sound from piling during the construction phase.

Conservation objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>Important elements are population size, structure, production, and condition of the species within the site.</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.</p>	<p>For both bottlenose dolphin and grey seal, with measures adopted as part of the Morgan Generation Assets applied there is no residual risk of injury during piling. In addition, measures adopted as part of the Morgan Generation Assets in the form of an Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraph 1.6.4.34 and 1.6.4.35 which will reduce the number of individuals affected further as bottlenose dolphin and grey seal features will be deterred beyond the predicted injury ranges.</p> <p>For bottlenose dolphin and grey seal there was no overlap of the 160 dB rms (strong disturbance) contour with any SAC designated for either species.</p> <p>For bottlenose dolphin the most conservative estimate of disturbance (applying a dose response approach) led to up to five animals predicted to experience potential disturbance from concurrent piling at a maximum hammer energy of 3,000 kJ, which equates to 1.57% of the IS MU.</p> <p>For grey seal the most conservative estimate of disturbance led to up to 61 animals which equates to 0.47% of the GSRP or 0.10% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter <i>et al.</i>, 2022) seals could move to alternative foraging grounds during piling.</p> <p>The iPCoD modelling suggests that there would be no long-term effects on the bottlenose dolphin or GSRP, including over the duration of the impact, six years post impact and up to 25 years after the start of piling.</p> <p>In addition, the maximum temporal scenario for piling at the Morgan Generation Assets is for up to 114 days of piling over the two year construction period meaning this impact will not be continuous over the whole duration of the construction period.</p> <p>Therefore, elevated underwater sound during piling will not prevent the populations of bottlenose dolphin and grey seal from maintaining themselves on a long-term basis as a viable component of their natural habitats. Elevated underwater sound during piling will not adversely affect the population size, structure, production, and condition of the species within the site. The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of impacts from elevated underwater sound during piling.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species such as cod and herring spawning grounds (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term. The presence, abundance, condition and diversity of habitats and species required to support this species will not be adversely affected. Elevated underwater sound during piling will not prevent the distribution, abundance and populations dynamics of the species within the site and population beyond the site, from remaining stable or increasing.</p>

1.6.4.67 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Llyn Peninsula and the Sarnau/Pen Llyn

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a'r Sarnau SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

The Maidens SAC

Grey seal

1.6.4.68 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.6.4.56 to 1.6.4.67. As The Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), there is no residual risk of injury during piling).

Conclusions

1.6.4.69 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraph 1.6.2.55) is discussed in Table 1.65 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.65: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound from piling during the Construction phase.

Conservation objective	Conclusion
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition.</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal.</p>	<p>For grey seal, with measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no residual risk of injury during piling. In addition, measures adopted as part of the Morgan Generation Assets in the form of an Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraphs 1.6.4.34 and 1.6.4.35 which will reduce the number of individuals affected further as grey seal features will be deterred beyond the predicted injury ranges.</p> <p>There was no overlap of the 160 dB re 1 μPa SPL_{rms} (strong disturbance) sound contour with any SAC designated for grey seal in the Morgan marine mammal study area.</p> <p>The most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 μPa SPL_{rms} (strong disturbance) led to up to 61 animals which equates to 0.47% of the GSRP or 0.10% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter <i>et al.</i>, 2022) seals could move to alternative foraging grounds during piling.</p> <p>The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) predicts that there would be no long-term effects on the grey seal population (see paragraph 1.6.4.176).</p> <p>In addition, the maximum temporal scenario for piling at the Morgan Generation Assets is for up to 114 days of piling over the two year construction period meaning this impact will not be continuous over the whole duration of the construction period.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will therefore not prevent the grey seal feature from being maintained or restored to favourable condition. On the basis of the above, elevated underwater sound during piling associated with the Morgan Generation Assets will also not prevent the grey seal population numbers and distribution from being maintained or enhanced in the long term.</p>
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site.</p>	<p>There is no pathway for elevated underwater sound during piling to result in adverse effects on the physical features of the qualifying species. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored.</p>

1.6.4.70 Therefore, it can be concluded beyond reasonable scientific doubt that there **is no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.4.71 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.56 to 1.6.4.67. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets than the Pen Llŷn a`r Sarnau/Lley

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Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), there is no residual risk of injury during piling).

Grey seal

1.6.4.72 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.4.90.

Conclusions

1.6.4.73 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraphs 1.6.2.61 to 1.6.2.65) is discussed in Table 1.66 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.66: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for elevated underwater sound from piling during the construction phase.

Conservation objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>Important elements are population size, structure, production, and condition of the species within the site.</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.</p>	<p>For bottlenose dolphin, with the measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no residual risk of injury during piling. In addition, measures adopted as part of the Morgan Generation Assets, in the form of an Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraph 1.6.4.34 and 1.6.4.35 which will reduce the number of individuals affected further as bottlenose dolphin features will be deterred beyond the predicted injury ranges.</p> <p>For bottlenose dolphin the most conservative estimate of disturbance led to up to five animals using the unweighted sound threshold of 160 dB rms (strong disturbance) predicted to experience potential disturbance, which equates to 1.57% of the MU.</p> <p>The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) predicts that there would be no long-term effects on the bottlenose dolphin population including over the duration of the impact, six years post impact and up to 25 years after the start of piling. Therefore, elevated underwater sound during piling will not prevent the features' population from maintaining itself on a long-term basis as a viable component of its natural habitat. Elevated underwater sound during piling will not adversely affect the population size, structure, production, and condition of the species within the site. The population of bottlenose dolphin within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of impacts from elevated underwater sound during piling.</p> <p>In addition, the maximum temporal scenario for piling at the Morgan Generation Assets is for up to 114 days of piling over the two year construction period meaning this impact will not be continuous over the whole duration of the construction period.</p>

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Conservation objective	Conclusion
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species such as cod and herring spawning (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The presence, abundance, condition and diversity of habitats and species required to support this species will not be adversely affected to such extent that would impact the species. Elevated underwater sound during piling will not prevent the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing.</p>

1.6.4.74 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.6.4.75 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau, assessed in paragraphs 1.6.4.56 to 1.6.4.67. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56) there is no residual risk of injury during piling).

Conclusions

1.6.4.76 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact against each relevant conservation objective (as presented in paragraphs 1.6.2.71 to 1.6.2.74) is presented in Table 1.67. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.67: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound from piling during the construction phase.

Conservation objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>Important elements are population size, structure, production, and condition of the species within the site.</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.</p>	<p>For grey seal, with the measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no residual risk of injury during piling. In addition, measures adopted as part of the Morgan Generation Assets in the form of an Outline MMMP (Document Reference J17) (an annex of the UWSMS), outlined in paragraph 1.6.4.34 and 1.6.4.35 which will reduce the number of individuals affected further as grey seal features will be deterred beyond the predicted injury ranges.</p> <p>There was no overlap of the 160 dB rms (strong disturbance) sound contour with any SAC designated for grey seal in the Morgan marine mammal study area.</p> <p>The most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 μPa SPL_{rms} (strong disturbance) led to up to 61 animals which equates to 0.47% of the GSRP or 0.10% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter <i>et al.</i>, 2022) seals could move to alternative foraging grounds during piling.</p> <p>The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) predicts that there would be no long-term effects on the grey seal population, including over the duration of the impact, and up to 25 years after the start of piling. Therefore, elevated underwater sound during piling will not prevent the population of grey seal from maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>In addition, the maximum temporal scenario for piling at the Morgan Generation Assets is for up to 114 days of piling over the two year construction period meaning this impact will not be continuous over the whole duration of the construction period.</p> <p>On the basis of the above elevated underwater sound during piling will also not adversely affect the population size, structure, production, and condition of the species within the site. The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced as a result of impacts associated with elevated underwater sound during piling.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species such as cod and herring spawning (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term. The presence, abundance, condition and diversity of habitats and species required to support this species will not be adversely affected to such an extent that would impact this species. Elevated underwater sound during piling will not prevent the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing.</p>

1.6.4.77 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

Injury

1.6.4.78 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.6.4.36 to 1.6.4.43. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude (i.e. no more than one individual affected by PTS).

Disturbance

1.6.4.79 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 300.5 km from the Morgan Array Area, which is outside the 15 km EDR outlined in JNCC (2020a). There is therefore no spatial overlap with the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, the thresholds for significant disturbance would not be exceeded.

Conclusions

1.6.4.80 It is concluded that no adverse effects on the harbour porpoise features which could undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact of elevated underwater sound during piling against each relevant conservation objective (as presented in paragraphs 1.6.2.79 to 1.6.2.80) is presented in Table 1.68. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.68: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound from piling during the construction phase.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>As outlined in paragraph 1.6.4.13, there is the potential for no more than one harbour porpoise to be injured during piling activities associated with the construction phase. In addition, the implementation of the Outline MMMP (Document Reference J17) will reduce the number of individuals affected further as harbour porpoise features will be deterred beyond the predicted injury ranges. The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 300.5 km from the Morgan Array Area, which is outside the 15 km EDR outlined in JNCC (2020a). There is therefore no spatial overlap with the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, the thresholds for significant disturbance would not be exceeded. Elevated underwater sound during piling associated with Morgan Generation Assets is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of its natural habitat over the long-term. Elevated underwater sound during piling associated with Morgan Generation Assets is not predicted to significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species (see Volume 2,</p>

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Conservation Objective	Conclusion
porpoises and their prey are maintained	Chapter 3: Fish and shellfish ecology of the Environmental Statement (F2.3)), effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not prevent prey species populations from being maintained in the long term.

1.6.4.81 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Lundy SAC

Grey seal

1.6.4.82 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.56 to 1.6.4.67. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Lley Pen Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude (i.e. with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), no more than one grey seal is predicted to be affected by PTS during piling).

Conclusions

1.6.4.83 It is concluded that no adverse effects on the harbour porpoise feature which could undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact of elevated underwater sound during piling against each relevant conservation objective (as presented in paragraphs 1.6.2.85 to 1.6.2.87) is presented in Table 1.69. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.69: Conclusions against the conservation objectives of the Lundy SAC for elevated underwater sound from piling during the construction phase.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound during piling to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>

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Conservation Objective	Conclusion
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>For grey seal, with the measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no more than one animal is predicted to be injured during piling activities associated with the construction phase. For grey seal the most conservative estimate of disturbance led to up to 61 animals predicted to experience potential disturbance which equates to 0.47% of the GSRP or 0.10% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter <i>et al.</i> (2022)), seals could move to alternative foraging grounds during piling. The iPCoD modelling predicts that there would be no long-term effects on the GSRP, including over the duration of the impact and up to 25 years after the start of piling. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent the population and the distribution of grey seal within the site from being maintained or restored.</p>

1.6.4.84 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Isles of Scilly Complex SAC

Grey seal

1.6.4.85 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyen Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.56 to 1.6.4.67. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lleyen Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude (i.e. with the measures adopted as part of the Morgan Generation Assets applied (detailed in Table 1.56), no more than one grey seal is predicted to be affected by PTS during piling).

Conclusions

1.6.4.86 It is concluded that no adverse effects on the harbour porpoise feature which could undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound during piling. An assessment of the impact of elevated underwater sound during piling against each relevant conservation objective (as presented in paragraphs 1.6.2.92 to 1.6.2.94) is presented in Table 1.70. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.70: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for elevated underwater sound from piling during the construction phase.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound during piling to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p>	<p>For grey seal, with the measures adopted as part of the Morgan Generation Assets detailed in Table 1.56 applied, there is no more than one animal is predicted to be injured during piling activities associated with the construction phase. For grey seal the most conservative estimate of disturbance led to up to 61 animals predicted to experience potential disturbance which equates to 0.47% of the GSRP or 0.10% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter <i>et al.</i> (2022)), seals could move to alternative foraging grounds during piling. The iPCoD modelling predicts that there would be no long-term effects on the GSRP, including over the duration of the impact and up to 25 years after the start of piling. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets will not prevent the population and the distribution of grey seal within the site from being maintained or restored.</p>
<p>The distributions of qualifying species within the site are maintained</p>	

1.6.4.87 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Additional sites for which a full assessment has not been conducted in line with the iterative process

1.6.4.88 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.4.3 to 1.6.4.87 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.4.89 to 1.6.4.111.

West Wales Marine/Gorllewin Cymru Forol SAC

- 1.6.4.89 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

- 1.6.4.90 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.4.61 to 1.6.4.67), it can be concluded that that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets alone.

Rockabill to Dalkey Island SAC

- 1.6.4.91 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Saltee Islands SAC

- 1.6.4.92 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.4.61 to 1.6.4.67), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets alone.

Roaringwater Bay and Islands SAC

- 1.6.4.93 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Blasket Islands SAC

- 1.6.4.94 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Blasket

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Islands SAC as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.6.4.95 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Abers - Côte des legends SCI

1.6.4.96 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Abers - Côte des legends SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Ouessant-Molène SCI

1.6.4.97 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Côte de Granit rose-Sept-Iles SCI

1.6.4.98 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Anse de Goulven, dunes de Keremma SCI

1.6.4.99 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Tregor Goëlo SCI

1.6.4.100 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Tregor

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Goëlo SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Côtes de Crozon SCI

1.6.4.101 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Chaussée de Sein SCI

1.6.4.102 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Cap Sizun SCI

1.6.4.103 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Récifs du talus du golfe de Gascogne SCI

1.6.4.104 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Anse de Vauville SCI

1.6.4.105 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Cap d'Erquy-Cap Fréhel SCI

1.6.4.106 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cap

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d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Baie de Saint-Brieuc – Est SCI

1.6.4.107 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Banc et récifs de Surtainville SCI

1.6.4.108 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.4.109 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Estuaire de la Rance SCI

1.6.4.110 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Baie du Mont Saint-Michel SCI

1.6.4.111 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.36 to 1.6.4.47), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound during piling from the Morgan Generation Assets alone.

Injury and disturbance from elevated underwater sound during UXO clearance

1.6.4.112 UXO clearance during the construction phase may result in hearing damage/auditory injury to or behavioural disturbance/displacement (including barrier effects) of marine mammals.

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- 1.6.4.113 The assessment of LSE in the HRA Stage 1 Screening Report (Document Reference E1.4) identified that during construction, LSE could not be ruled out for the potential impact of Injury and disturbance from elevated underwater sound during UXO clearance. This relates to the sites listed in Table 1.2: A summary of all European sites for which the potential for LSE could not be discounted at Stage 1 screening stage, and for which Appropriate Assessment is required.
- 1.6.4.114 The following sections explain how this potential impact on Annex II marine mammal features of the SACs outlined in Table 1.49 have been quantified and assessed.
- 1.6.4.115 The MDS considered for the assessment of potential impacts on Annex II marine mammals for elevated underwater sound during UXO clearance is presented in Table 1.71.

Table 1.71: Maximum design scenario considered for the assessment of potential impacts on marine mammals from injury and disturbance from elevated underwater sound during UXO clearance.

Phase	Maximum design scenario	Justification
Construction phase	<ul style="list-style-type: none"> • Clearance of up to 13 UXO within the Morgan Array Area • A range of UXO sizes assessed from 25 kg up to 907 kg with 130 kg the most likely (common) maximum. • For high order detonation donor charges of 1.2 kg (most common) and 3.5 kg (single barracuda blast charge). • Up to 0.5 kg NEQ clearance shot for neutralisation of residual explosive material at each location. • Clearance during daylight hours only. <p>MDS is for high order clearance but assessment also considered:</p> <ul style="list-style-type: none"> • Low order clearance charge size of 0.08 kg • Low yield clearance configurations of 0.75 kg charges (up to 4 x 0.75 kg). 	<p>Maximum number and maximum size of UXOs encountered in the Morgan Array Area. Due to uncertainties in size of UXOs the assessment presents a range, highlighting the most likely size (common) to be encountered.</p> <p>Most likely and maximum donor charges assessed for high order detonation.</p> <p>Assumption of a clearance shot of up to 0.5 kg at all locations although noting that this may not always be required.</p> <p>For low order/low yield clearance charges are based on the maximum required to initiate clearance event.</p>

Measures adopted as part of the Morgan Generation Assets

- 1.6.4.116 The measures adopted as part of the Morgan Generation Assets that are relevant to the effects of elevated underwater sound during UXO clearance during the construction phase are outlined in Table 1.56.

Construction phase

Injury -PTS

- 1.6.4.117 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) presents the impact ranges for low order and low yield UXO clearance activities, donor charges used in high order UXO clearance and high order clearance of UXO. The number of animals predicted to experience PTS due to low order UXO is less than one animal for bottlenose dolphin, grey seal and harbour seal and up to five harbour porpoise. The number of animals predicted to experience PTS due to high order clearance of UXO (907 kg) is less than one bottlenose dolphin and harbour seal,

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up to two grey seal and up to 195 harbour porpoise. Additional information is provided in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).

- 1.6.4.118 As reported in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), an explosive mass of 907 kg (absolute maximum high order explosion) yielded the largest PTS ranges for all species, with the greatest range of effects (15,370 m) predicted for harbour porpoise (SPL_{pk}). However, the more common 130 kg charge sees this injury range reduce to 8,045 m for harbour porpoise (SPL_{pk}). Conservatively, the number of harbour porpoise that could be potentially injured, based on the peak seasonal densities from the Morgan digital aerial surveys, was estimated as 195 animals for 907 kg UXO high order explosion (absolute maximum) equating to 0.31% of the Celtic and Irish Seas MU. Predicted numbers were much smaller for the 130 kg UXOs with up to 54 animals potentially experiencing PTS. For low order techniques, the largest range of 2,290 m was predicted from the 4 x 0.75 kg low-yield charges, which could injure up to five harbour porpoise within this range.
- 1.6.4.119 The underwater sound assessment found that the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric is 890 m for the absolute maximum detonation of charge size of 907 kg, but this is reduced to 464 m for 130 kg most likely (common maximum) and 268 m for 25 kg. Therefore conservatively, during high order detonation of any size of UXO up to the maximum the number of individuals that could be injured for any of these species (based on densities presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) was estimated as no more than one animal. With reference to the wider population, this equated to a very small proportion of the relevant MU (0.001%). For low order techniques, the injury ranges were considerably lower with a maximum of 133 m estimated with no more than one animal of any species likely to be present within this range.
- 1.6.4.120 The underwater sound assessment found that the maximum injury (PTS) range estimated for grey seal using the SPL_{pk} metric was 3,015 m for the detonation of charge size of 907 kg (absolute maximum), but this was reduced to 1,580 m for the most likely (common) maximum 130 kg and 910 m for 25 kg. Therefore conservatively, the number of individuals that could be potentially injured, based on the Carter *et al.* (2022) densities, was estimated as up to two animals for the absolute maximum 907 kg UXO high order explosion (absolute maximum), which equates to 0.009% of the GSRP or 0.002% of the OSPAR III population, and less than one animal for both 130 kg UXO most likely (common) maximum and 25 kg UXO. For low order techniques, there would be no more than one animal potentially within the impact range.
- 1.6.4.121 The underwater sound assessment found that the maximum injury (PTS) range estimated for harbour seal using the SPL_{pk} metric was 3,015 m for the detonation of charge size of 907 kg (absolute maximum), but this was reduced to 1,580 m for 130 kg and 910 m for 25 kg. Therefore conservatively, the number of individuals that could be injured, was estimated as less than one animal for 907 kg UXO high order explosion (absolute maximum), 130 kg UXO most likely (common) maximum and 25 kg UXO, which equates to up to 0.0001% of the reference population (Wales, NW England and Northern Ireland SMUs). For low order techniques, the maximum range predicted was up to 449 m and there would be no more than one animal potentially within this impact range.
- 1.6.4.122 Further detail on underwater sound modelling of UXO clearance is provided in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement

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(Document Reference F3.3.1) and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).

Behavioural displacement (TTS as a proxy)

- 1.6.4.123 Within Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) a second threshold assessed was the onset of TTS where the resulting effect would be a potential temporary loss in hearing. Whilst similar ecological functions could be inhibited in the short term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. However, the onset of TTS also corresponds to a 'moving away response' as this is the threshold at which animals are likely to move away from the ensonified area. Thus, the onset of TTS also reflects the threshold at which strong disturbance could occur (it represents the boundary between the most severe disturbance levels and the start of physical auditory impacts on animals).
- 1.6.4.124 As before, the assessment of strong disturbance considered low order and low yield UXO clearance activities, donor charges for high order UXO disposal and high order explosions as there is potential for high order explosions. The largest ranges using SPL_{pk} were predicted for clearance of the 907 kg UXO (absolute maximum) with potential TTS/moving away response over a distance of up to approximately 28 km for harbour porpoise. Ranges predicted for other species using SPL_{pk} were smaller for all other species, with potential TTS/moving away response over a distance of approximately 1.6 km for bottlenose dolphin and approximately 5.5 km for both grey seal and harbour seal.
- 1.6.4.125 As seen for PTS, the highest number of animals affected, based on high order detonation of a 907 kg UXO (absolute maximum), was found for harbour porpoise where up to 661 animals could experience TTS within the 28 km impact range equating to 1.06% of the MU population (based on SPL_{pk}). For bottlenose dolphin less than one animal could experience TTS within the 1.6 km impact range (based on SPL_{pk}). The number of grey seal within a predicted 5.5 km TTS range was estimated as six animals (0.04% of the GSRP or 0.01% of the OSPAR Region III population) (based on SPL_{pk}) and for harbour seal less than one animal could experience TTS within the 5.5 km impact range (based on SPL_{pk}).
- 1.6.4.126 Further detail on sound modelling of UXO clearance is provided in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1) and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).

Further mitigation measures

- 1.6.4.127 The project alone assessment of injury from elevated underwater sound during UXO clearance concludes a significant effect in EIA terms, for harbour porpoise only (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). The project alone assessment of disturbance from elevated underwater sound during UXO clearance concluded no significant effect in EIA terms, for all other marine mammal receptors. The project has committed to the development of an UWSMS to manage underwater sound levels associated with significant impacts from the project, to reduce the magnitude of impacts such that there will be no residual significant effect. The UWSMS strategy will also reduce impacts resulting from underwater sound on the SACs designated for Annex II marine mammals assessed below.

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1.6.4.128 The UWSMS will present relevant further potential measures (such as NAS, temporal and spatial restrictions, low order clearance methods, soft start) to manage underwater sound levels so as to reduce the magnitude of impacts for the project alone. The project has prepared an Outline UWSMS (Document Reference J13) which is secured in the deemed marine licences in the draft DCO (Document Reference C1), which establishes a process of investigating options to manage underwater sound levels, in consultation with the licensing authority and SNCBs and agreeing prior to construction, mitigation measures that will be implemented to reduce the magnitude of impacts such that there will be no residual significant effect from the project (in this case, on harbour porpoise). These further measures would also reduce impacts associated with underwater sound for other marine mammal receptors.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.6.4.129 The conclusions presented onwards are based on the assessment for high order clearance.

1.6.4.130 As outlined in paragraph 1.6.4.118, the number of harbour porpoise that could be potentially injured was estimated as 195 animals for 907 kg UXO high order explosion (absolute maximum) which equates to 0.31% of the Celtic and Irish Seas MU. For TTS, as outlined in paragraph 1.6.4.124 1.6.4.125, the number of harbour porpoise potentially affected by TTS based on high order detonation of a 907 kg UXO (absolute maximum), was up to 661 animals which equates to 1.06% of the MU population.

1.6.4.131 With the implementation of measures adopted as part of the Morgan Generation Assets (outlined in Table 1.56; i.e. development and adherence to a MMMP that requires implementation of a mitigation hierarchy with regard to UXO), in place, Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) identified that there would be a residual risk of injury over a range of 2,290 m that would require further mitigation. Where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to approximately 15 km for a 907 kg UXO (absolute maximum) and approximately 8 km for a 130 kg UXO (most likely common maximum). Therefore, adopting standard industry practice (JNCC, 2010b), measures adopted as part of the Morgan Generation Assets will be applied as part of a MMMP (Document Reference J17), as an annex of the UWSMS (Document Reference J13). Measures adopted as part of the Morgan Generation Assets will also include the use of ADDs and scare charges to deter animals from the injury zone (see Table 1.56). With the measures adopted as part of the Morgan Generation Assets applied, it is anticipated that for most animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.6.4.132 For harbour porpoise, the ranges of effect for high order clearance are large and there is considered to be a residual risk of PTS to a small number of individuals. Whilst it is difficult to quantify this residual risk, it is anticipated that there would be some measurable changes at an individual level. This would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected.

1.6.4.133 In line with guidance from stakeholders (JNCC and Natural England) the EDR approach has also been used for the assessment of disturbance associated with UXO detonation during the construction phase for harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC. The EDR approach, as outlined in JNCC (2020), recommends the use of 26 km deterrence range for UXO. The assessment considered UXO detonation could occur at the closest location within

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the Morgan Array Area to the North Anglesey Marine/Gogledd Môn Forol SAC (as the closest designated site to the Morgan Generation Assets).

- 1.6.4.134 As shown in Figure 1.11, the implementation of a 26 km EDR for the Morgan Generation Assets does not result in any overlap with the North Anglesey Marine/Gogledd Môn Forol SAC, given that it is located 28.2 km from the Morgan Array Area. Therefore, using the disturbance footprints associated with the Morgan Generation Assets, this does not result in any potential disturbance across the North Anglesey Marine/Gogledd Môn Forol SAC. Therefore, disturbance associated with UXO detonation would not contribute to or exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the SAC over the season.
- 1.6.4.135 The next closest SAC designated for harbour porpoise is the North Channel SAC, located 64.0 km away from the Morgan Array Area, which is also outside of the 26 km EDR range. Therefore, with the implementation of a 26 km EDR, there will be no overlap with the North Channel SAC or any other SACs designated for harbour porpoise and disturbance associated with UXO detonation will not contribute to or exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the SAC over the season.

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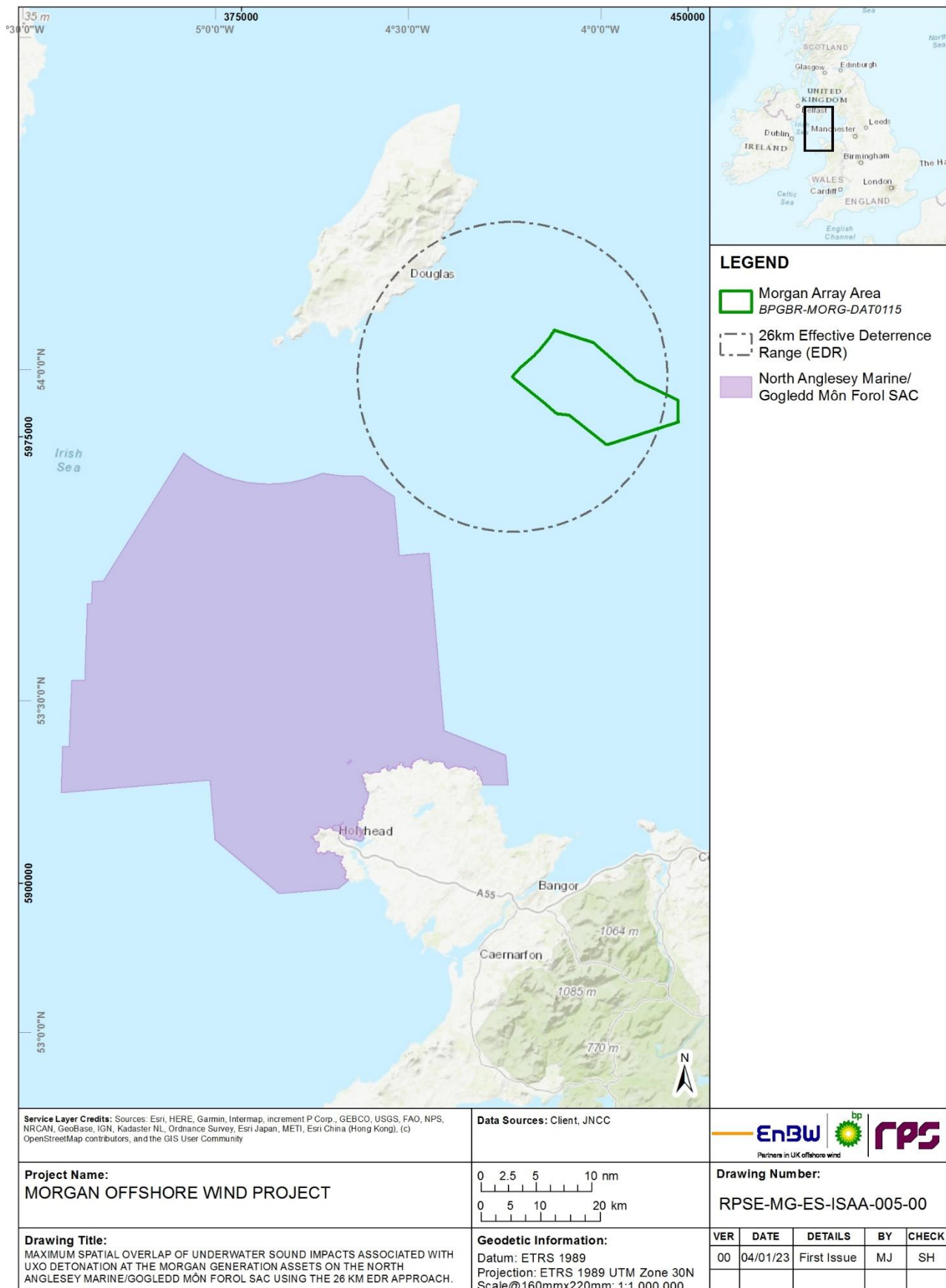


Figure 1.11. Spatial overlap of underwater sound impacts with UXO detonation at the Morgan Generation Assets on the North Anglesey Marine/Gogledd Mon Forol SAC using the 26 km EDR approach.

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Conclusions

1.6.4.136 It is concluded that no adverse effects on the harbour porpoise features which could undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.72.

Table 1.72: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>As outlined in paragraph 1.6.4.131, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to approximately 15 km for a 907 kg UXO (absolute maximum) and approximately 8 km for a 130 kg UXO. The North Anglesey Marine/Gogledd Môn Forol SAC is located 28.2 km from the Morgan Generation Assets therefore there is no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise, there is potential for harbour porpoise to be present within the impact zone. With measures adopted as part of the Morgan Generation Assets applied it is anticipated that animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. Whilst it is anticipated that there would be some measurable changes at an individual level, this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected (0.31%). TTS is reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent harbour porpoise from remaining a viable component of the SAC.</p> <hr/> <p>TTS and behavioural disturbance is considered reversible and therefore animals that experience this effect are anticipated to fully recover. It is, however, recognised that where measures adopted as part of the Morgan Generation Assets apply deterrence measures (i.e. ADD and soft start charges) by their nature would contribute to, rather than reduce, the moving away response (behavioural disturbance). Any behavioural disturbance would occur during a short time period during the construction phase and is not anticipated to have long term population effects on the feature (i.e. features are anticipated to fully recover). There is no spatial overlap of the injury ranges associated with UXO detonation and the SAC. Therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds will not be exceeded. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not result in significant disturbance of harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Supporting habitats and processes will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not affect prey species populations being maintained in the long term.</p>

1.6.4.137 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn

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Forol SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

North Channel SAC

Harbour porpoise

1.6.4.138 The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64.0 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.6.4.129 to 1.6.4.137. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.4.139 It is concluded that no adverse effects on the harbour porpoise features which could undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in 1.6.2.12 to 1.6.2.14) is discussed in Table 1.73.

Table 1.73: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p>	<p>As outlined in paragraph 1.6.4.131, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to approximately 15 km for a 907 kg UXO (absolute maximum) and approximately 8 km for a 130 kg UXO. The North Channel SAC is located 64.0 km from the Morgan Generation Assets, therefore there is no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise, there is potential for harbour porpoise to be present within the impact zone. With measures adopted as part of the Morgan Generation Assets applied it is anticipated that animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. Whilst it is anticipated that there would be some measurable changes at an individual level, this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected (0.31%). TTS is reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent harbour porpoise from remaining a viable component of the SAC.</p>
<p>There is no significant disturbance of the species</p>	<p>TTS and behavioural disturbance is considered reversible and therefore animals that experience this effect are anticipated to fully recover. It is, however, recognised that where measures adopted as part of the Morgan Generation Assets apply, deterrence measures (i.e. ADD and soft start charges) by their nature would contribute to, rather than reduce, the moving away response (behavioural disturbance). Any behavioural disturbance would occur during a short time period during the construction phase and is not anticipated to have long term population effects on the feature (i.e. features are anticipated to fully recover). There is no spatial overlap of the injury ranges associated with UXO detonation and the SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the injury thresholds will not be exceeded. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not result in significant disturbance of harbour porpoise.</p>

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Conservation Objective	Conclusion
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Supporting habitats and processes will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not affect prey species populations being maintained in the long term.</p>

1.6.4.140 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Strangford Lough SAC

Harbour seal

1.6.4.141 As outlined in paragraph 1.6.4.121, considering the maximum injury (PTS) range estimated for harbour seal using the SPL_{pk} , the number of individuals that could be potentially injured was estimated as less than one animal for 907 kg UXO high order explosion (absolute maximum), 130 kg UXO and 25 kg UXO, which equates to up to 0.0001% of the reference population (Wales, NW England and Northern Ireland SMUs).

1.6.4.142 Measures adopted as part of the Morgan Generation Assets will be applied as part of an Outline MMMP (Document Reference J17) in line with standard industry practice (JNCC, 2010a). Measures will therefore also include the use of ADDs and scare charges to deter animals from the injury zone. With measures adopted as part of the Morgan Generation Assets applied, it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.6.4.143 As outlined in paragraph 1.6.4.121, the number of animals at risk of potential PTS would be very small, with the implementation of measures adopted as part of the Morgan Generation Assets this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected.

Conclusions

1.6.4.144 It is concluded that no adverse effects on the harbour seal features which could undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraph 1.6.2.19) is discussed in Table 1.74. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.74: Conclusions against the conservation objectives of the Strangford Lough SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>The number of animals at risk of potential PTS would be very small (less than one animal), with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. TTS impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound generation during UXO clearance associated with Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the harbour seal population from being maintained or enhanced.</p> <p>It should be noted that no condition assessments are available for this SAC, as outlined in section 1.6.2.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>Physical features used by harbour seal within the site will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not prevent physical features used by harbour seal from being maintained or enhanced.</p>

1.6.4.145 Therefore, it can be concluded beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Murlough SAC

Harbour seal

1.6.4.146 Impacts from elevated underwater sound during UXO clearance on harbour seal features of the Murlough SAC are considered to be similar to those associated with Strangford Loch SAC due to the proximity of the locations. The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.6.4.141 to 1.6.4.145. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.4.147 It is concluded that no adverse effects on the harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraph 1.6.2.24) is discussed in Table 1.75. Where the

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justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.75: Conclusions against the conservation objectives of the Murlough SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>The number of harbour seal at risk of potential PTS would be very small (less than one animal), with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. TTS impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the harbour seal population and distribution from being maintained or enhanced.</p> <p>It should be noted that no condition assessments are available for this SAC, as outlined in section 1.6.2.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>Physical features used by harbour seal within the site will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not prevent physical features used by harbour seal from being maintained or enhanced.</p>

1.6.4.148 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Llwyn Peninsula and the Sarnau/Pen Llwn a`r Sarnau SAC

Bottlenose dolphin

1.6.4.149 As outlined in paragraph 1.6.4.119, considering the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric (890 m), the maximum number of individuals that could be potentially injured (based on densities presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant MU (0.001%). For low order techniques, the injury ranges were considerably lower. As outlined in paragraph 1.6.4.125, less than one bottlenose dolphin could experience TTS within the 1.6 km impact range.

1.6.4.150 Measures adopted as part of the Morgan Generation Assets will be applied as part of an Outline MMMP (Document Reference J17) in line with standard industry practice (JNCC, 2010a). Measures adopted as part of the Morgan Generation Assets will therefore also include the use of ADDs and scare charges to deter animals from the injury zone. With measures adopted as part of the Morgan Generation Assets applied

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it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

- 1.6.4.151 As outlined in paragraph 1.6.4.119, the number of animals at risk of potential PTS would be very small, with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected.

Grey seal

- 1.6.4.152 As outlined in paragraph 1.6.4.120, considering the maximum injury (PTS) range estimated for grey seal using the SPL_{pk} metric, the number of individuals that could be potentially injured, based on the inshore densities, was estimated as up to two animals for 907 kg UXO high order explosion (absolute maximum), which equates to 0.009% of the GSRP or 0.002% of the OSPAR III population. For grey seal, the number of grey seal within a predicted 5.5 km TTS range was estimated as six animals (0.04% of the GSRP or 0.01% of the OSPAR Region III population) (based on SPL_{pk}).

- 1.6.4.153 Measures adopted as part of the Morgan Generation Assets will be applied as part of an Outline MMMP (Document Reference J17) in line with standard industry practice (JNCC, 2010a). Measures adopted as part of the Morgan Generation Assets will therefore also include the use of ADDs and scare charges to deter animals from the injury zone. With measures adopted as part of the Morgan Generation Assets applied it is anticipated that most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

- 1.6.4.154 As outlined in paragraph 1.6.4.120, the number of animals at risk of potential PTS would be very small, with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected.

Conclusions

- 1.6.4.155 It is concluded that no adverse effects on the bottlenose dolphin and grey seal features which could undermine the conservation objectives of the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.76. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.76: Conclusions against the conservation objectives of Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The number of animals at risk of potential PTS would be very small (less than one bottlenose dolphin and up to two grey seal), with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (less than one bottlenose dolphin and less than six grey seal but that this would not manifest to population level effects demonstrated by the small proportion of the MUs potentially affected. TTS impacts are reversible and therefore animals that experience this effect are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the bottlenose dolphin and grey seal populations from maintaining themselves on a long-term basis as a viable component of their natural habitats. Similarly, elevated underwater sound as a result of UXO clearance associated with Morgan Generation Assets will not adversely affect the population size, structure, production, and condition of bottlenose dolphin and grey seal within the site. The populations of bottlenose dolphin and grey seal within the site is such that the natural ranges of the populations are not being reduced or likely to be reduced for the foreseeable future as a result of impacts from elevated underwater sound during UXO clearance.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>The presence, abundance, condition and diversity of supporting habitats and processes will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not affect the distribution, abundance and populations dynamics of bottlenose dolphin and grey seal within the site and population beyond the site from remaining stable or increasing.</p>

1.6.4.156 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

The Maidens SAC

Grey seal

1.6.4.157 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.149 to 1.6.4.156. As The Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.4.158 It is concluded that no adverse effects on the bottlenose dolphin and grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the

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impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraph 1.6.2.55) is discussed in Table 1.77. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.77: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the grey seal population</p>	<p>The number of grey seal at risk of potential PTS would be very small (up to two animals), with the implementation of measures adopted as part of the Morgan Generation Assets this would be further reduced. There may be some measurable changes at an individual level (for up to six animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. TTS impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the population and distribution of grey seal from being maintained or enhanced.</p> <p>It should be noted that no condition assessments are available for this SAC, as outlined in section 1.6.2.</p>
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>Physical features used by grey seal within the site will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not prevent physical features from being maintained or enhanced.</p>

1.6.4.159 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

1.6.4.160 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lleyl Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.149 to 1.6.4.156. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets than the Lleyl Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Bottlenose dolphin

1.6.4.161 As outlined in paragraph 1.6.4.119, considering the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric (890 m), the maximum number

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of individuals that could be potentially injured (based on densities presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) was estimated to be no more than one. With reference to the wider population, this equated to a very small proportion of the relevant MU (0.01%). For low order techniques, the injury ranges were considerably lower. As outlined in paragraph 1.6.4.125, less than one bottlenose dolphin could experience TTS within the 1.6 km impact range, which equates to 0.34% of the MU.

1.6.4.162 Measures adopted as part of the Morgan Generation Assets will be applied as part of an Outline MMMP (Document Reference J17) in line with standard industry practice (JNCC, 2010a). Measures adopted as part of the Morgan Generation Assets will therefore also include the use of ADDs and scare charges to deter animals from the injury zone. With measures adopted as part of the Morgan Generation Assets applied it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.6.4.163 As outlined in paragraph 1.6.4.119, the number of animals at risk of potential PTS would be very small, with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected.

Grey seal

1.6.4.164 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.4.181.

Conclusions

1.6.4.165 It is concluded that no adverse effects on the bottlenose dolphin features which could undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraphs 1.6.2.61 to 1.6.2.65) is discussed in Table 1.78. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.78: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The number of animals at risk of potential PTS would be very small (less than one bottlenose dolphin), with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced.</p> <p>There may be some measurable changes at an individual level (for less than one bottlenose dolphin), but that this would not manifest to population level effects demonstrated by the small proportion of the MUs potentially affected. TTS impacts are reversible and therefore animals that experience this effect are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the population of bottlenose dolphin from maintaining itself on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. The population of bottlenose dolphin within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of impacts from elevated underwater sound during UXO clearance associated with piling.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>The presence, abundance, condition and diversity of supporting habitats and processes will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not affect the distribution, abundance and populations dynamics of bottlenose dolphin within the site and population beyond the site from remaining stable or increasing.</p>

1.6.4.166 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.6.4.167 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.149 to 1.6.4.156. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.4.168 It is concluded that no adverse effects on the qualifying Annex II grey seal features which could undermine the conservation objectives of the Pembrokeshire Marine/Sir

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Benfro Forol SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraphs 1.6.2.71 to 1.6.2.74) is discussed in Table 1.79. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.79: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The number of animals at risk of potential PTS would be very small (up to two animals), with the implementation of measures adopted as part of the Morgan Generation Assets this would be further reduced. There may be some measurable changes at an individual level (for up to six animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. TTS impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent the grey seal population from maintaining itself on a long-term basis as a viable component of its natural habitat. Similarly, the grey seal population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>The presence, abundance, condition and diversity of supporting habitats and processes will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not affect the distribution, abundance and populations dynamics of grey seal within the site and population beyond the site from remaining stable or increasing.</p>

1.6.4.169 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of The Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.4.170 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.6.4.129 to 1.6.4.137. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from the Morgan Array Area), it is considered that effects would be of similar if not lower magnitude.

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Conclusions

1.6.4.171 It is concluded that no adverse effects on the harbour porpoise features which could undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objectives (as presented in paragraphs 1.6.2.79 to 1.6.2.80) is discussed in Table 1.80.

Table 1.80: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
The species is a viable component of the site	As outlined in paragraph 1.6.4.131, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to approximately 15 km for a 907 kg UXO (absolute maximum) and approximately 8 km for a 130 kg UXO. The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 300.5 km from the Morgan Generation Assets, therefore there is no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise, there is potential for harbour porpoise to be present within the impact zone. With measures adopted as part of the Morgan Generation Assets applied it is anticipated that animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. Whilst it is anticipated that there would be some measurable changes at an individual level, this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected (0.31%). TTS is reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not prevent harbour porpoise from remaining a viable component of the SAC.
There is no significant disturbance of the species	TTS and behavioural disturbance is considered reversible and therefore animals that experience this effect are anticipated to fully recover. It is, however, recognised that where measures adopted as part of the Morgan Generation Assets applies deterrence measures (i.e. ADD and soft start charges) by their nature would contribute to, rather than reduce, the moving away response (behavioural disturbance). Any behavioural disturbance would occur during a short time period during the construction phase and is not anticipated to have long term population effects on the feature (i.e. features are anticipated to fully recover). There is no spatial overlap of the injury ranges associated with UXO detonation and the SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds will not be exceeded. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not result in significant disturbance of harbour porpoise.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained	Supporting habitats and processes relevant to harbour porpoise will not be affected by elevated underwater sound during UXO clearance associated with Morgan Generation Assets (i.e. there will be no habitat loss/ disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant in EIA terms or long-term ensuring that the Morgan Generation Assets will not affect prey species populations being maintained in the long term.

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1.6.4.172 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Lundy SAC

Grey seal

1.6.4.173 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.6.4.149 to 1.6.4.156. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.4.174 It is concluded that no adverse effects on the grey seal features which could undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraphs 1.6.2.85 to 1.6.2.87) is discussed in Table 1.81. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.81: Conclusions against the conservation objectives of the Lundy SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound during UXO clearance to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function the habitats of grey seal or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The number of animals at risk of potential PTS would be very small (up to two animals), with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for up to six animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. TTS impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not adversely affect the population and distribution of grey seal within the SAC.</p>

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1.6.4.175 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Isles of Scilly Complex SAC

Grey seal

1.6.4.176 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC, assessed in paragraphs 1.6.4.149 to 1.6.4.156. As The Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.4.177 It is concluded that no adverse effects on the grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound during UXO clearance. An assessment of the impact of elevated underwater sound during UXO clearance against each relevant conservation objective (as presented in paragraphs 1.6.2.92 to 1.6.2.94) is discussed in Table 1.82. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.82: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for elevated underwater sound during UXO clearance.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound during UXO clearance to result in adverse effects on the habitats of the grey seal (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function the habitats of grey seal or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The number of animals at risk of potential PTS would be very small (up to two animals), with the implementation of measures adopted as part of the Morgan Generation Assets, this would be further reduced. There may be some measurable changes at an individual level (for up to six animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. TTS impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, even where low order/low yield measures are not possible and high order techniques are required, injury and disturbance from elevated underwater sound during UXO clearance associated with Morgan Generation Assets will not adversely affect the population and distribution of grey seal within the SAC.</p>

1.6.4.178 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result

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of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Sites assessed in line with the iterative approach

1.6.4.179 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Report Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.4.129 to 1.6.4.178 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.4.180 to 1.6.4.202.

West Wales Marine/Gorllewin Cymru Forol SAC

1.6.4.180 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.6.4.181 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.4.149 to 1.6.4.156), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets alone.

Rockabill to Dalkey Island SAC

1.6.4.182 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Saltee Islands SAC

1.6.4.183 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.4.149 to 1.6.4.156), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a

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result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets alone.

Roaringwater Bay and Islands SAC

- 1.6.4.184 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Blasket Islands SAC

- 1.6.4.185 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

- 1.6.4.186 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Abers - Côte des legends SCI

- 1.6.4.187 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Abers - Côte des legends SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Ouessant-Molène SCI

- 1.6.4.188 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Côte de Granit rose-Sept-Iles SCI

- 1.6.4.189 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côte de

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Granit rose-Sept-Iles SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Anse de Goulven, dunes de Keremma SCI

1.6.4.190 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Tregor Goëlo SCI

1.6.4.191 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Côtes de Crozon SCI

1.6.4.192 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Chaussée de Sein SCI

1.6.4.193 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Cap Sizun SCI

1.6.4.194 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Récifs du talus du golfe de Gascogne SCI

1.6.4.195 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Récifs du

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talus du golfe de Gascogne SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Anse de Vauville SCI

1.6.4.196 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Cap d'Erquy-Cap Fréhel SCI

1.6.4.197 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Baie de Saint-Brieuc – Est SCI

1.6.4.198 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Banc et récifs de Surtainville SCI

1.6.4.199 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.4.200 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Estuaire de la Rance SCI

1.6.4.201 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable

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scientific doubt there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Baie du Mont Saint-Michel SCI

1.6.4.202 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.129 to 1.6.4.140), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound during UXO clearance from the Morgan Generation Assets alone.

Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys

1.6.4.203 Site investigation surveys during the construction phase have the potential to cause direct or indirect effects (including hearing injury or behavioural disturbance) on marine mammals.

1.6.4.204 Several sonar-like survey types will potentially be used for the geophysical surveys, including MBES, SSS, SBES, SBP and sparker (as an example of UHRS) (typical site investigation sources and associated sound level parameters are set out in Table 1.83). The equipment likely to be used can typically work at a range of signal frequencies, depending on the distance to the seabed and the required resolution. For sonar-like sources the signal is highly directional, acts like a beam and is emitted in pulses. Sonar-based sources are considered as continuous (non-impulsive) because they generally comprise a single (or multiple discrete) frequency as opposed to a broadband signal with high kurtosis, high peak pressures and rapid rise times. Unlike the sonar-like survey sources, the UHRS is likely to utilise a sparker, which produces an impulsive, broadband source signal. A full description of the source sound levels for geophysical survey activities is provided in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1).

1.6.4.205 The assessment of LSE in the HRA Stage 1 Screening Report (Document Reference E1.4) identified that during construction, LSE could not be ruled out for the potential impact of elevated underwater sound during pre-construction site investigation surveys. This relates to the designated sites listed in Table 1.2 and relevant Annex II marine mammal features.

1.6.4.206 The assessment is undertaken as an iterative approach and considers the closest site in the first instance and the sites suggested in NRW (2022d). In alignment with advice from Natural England, all SACs within English waters have been assessed fully in this HRA Stage 2 ISAA – Part 2 SAC assessments. Natural England and the MMO did not raise any objections to the approach to sites further afield than English waters.

1.6.4.207 The following sections explain how this potential impact on Annex II marine mammal features of the SACs outlined in Table 1.49. have been quantified and assessed.

1.6.4.208 The MDS considered for the assessment of potential impacts on Annex II marine mammals for elevated underwater sound during pre-construction site investigation surveys is presented in Table 1.83.

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Table 1.83: Maximum design scenario considered for the assessment of potential impacts on marine mammals from elevated underwater sound during pre-construction and site investigation surveys during the construction phase.

Phase	Maximum design scenario	Justification
Construction phase	<p>Geophysical site investigation activities include:</p> <ul style="list-style-type: none"> • MBES – 200 to 500 kHz; 180 to 240 dB re 1 μPa re 1 m (SPL_{rms}) • SSS - 200 to 700 kHz; 216 to 228 dB re 1 μPa re 1 m (SPL_{rms}) • SBES – 120 to 400 kHz; 180 to 240 dB re 1 μPa re 1 m (SPL_{rms}) • SBP – <ul style="list-style-type: none"> – Chirp: 0.2 to 14 kHz; 200 to 240 dB re 1 μPa re 1 m (SPL_{rms}) – Pinger: 2 to 7 kHz; 200 to 235 dB re 1 μPa re 1 m (SPL_{rms}) • Sparker (as an example of UHRS) (0.05 to 4 kHz; 219 dB re 1 μPa re 1 m (SPL_{rms}); 182 dB re 1 μPa²s SEL). <p>Geotechnical site investigation activities include:</p> <ul style="list-style-type: none"> • Borehole drilling • Cone penetration tests (CPT) • Vibrocoreing. <p>Pre-construction site investigation surveys will involve the use of several geophysical/geotechnical survey vessels and take place over up to a period of up to eight months.</p>	<p>Range of geophysical and geotechnical activities likely to be undertaken using equipment typically employed for these types of surveys. Parameters chosen resulted in the greatest range of effect (e.g. highest source, fastest pulse rate, longest pulse duration) and as such were those that would lead to the greatest spatial extent for injury or disturbance.</p>

Measures adopted as part of the Morgan Generation Assets

1.6.4.209 The measures adopted as part of the Morgan Generation Assets that are relevant to effects from elevated underwater sound during pre-construction site investigation surveys are outlined in Table 1.56.

Construction phase

Information to support assessment

1.6.4.210 Potential impacts of site investigation surveys will depend on the characteristic of the source, survey design, frequency bands and water depth. Sonar like sources have very strong directivity which effectively means that there is only potential for injury when a marine mammal is directly underneath the sound source. Once the animal moves outside of the main beam, there is no potential for injury.

Auditory injury

1.6.4.211 For geotechnical surveys, potential impacts of site investigation surveys will depend on the characteristic of the source, survey design, frequency bands and water depth. Sonar like sources have very strong directivity which effectively means that there is only potential for injury when a marine mammal is directly underneath the sound

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source. Once the animal moves outside of the main beam, there is no potential for injury.

- 1.6.4.212 With respect to the ranges within which there is a potential of PTS occurring to marine mammals as a result of geophysical investigation activities, based on the SEL_{cum} metric, the maximum PTS is expected to occur out to 254 m for harbour porpoise due to SBP (chirp/pinger) (Table 1.84). For bottlenose dolphin the maximum PTS is expected to occur out to 41 m for MBES and for pinniped species out to 40 m due to SBP.
- 1.6.4.213 With respect to the ranges within which there is a potential of PTS occurring to marine mammals as a result of geotechnical investigation activities, PTS thresholds were not exceeded for most marine mammal species, except harbour porpoise (

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1.6.4.214 Table 1.85). PTS may occur during Cone Penetration Testing out to a maximum of 55 m for harbour porpoise (based on the SEL_{cum} metric), and for vibro-coring to a maximum of 79 m (based on the SEL_{cum} metric) for harbour porpoise.

1.6.4.215 The number of marine mammals potentially injured within the modelled ranges for PTS were estimated using species-specific density estimates (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). Due to low injury ranges, for all marine species, there is the potential for no more than one animal to experience PTS (and no animals where the threshold is not exceeded) as a result of geophysical and geotechnical site investigation surveys. The site-investigation surveys are considered to be short term as they will take place over a period of several months (typically up to two months). Mitigation for injury during geophysical surveys using a sub-surface sensor from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with JNCC guidance (JNCC, 2017). The largest range was predicted as 254 m (for SBP) and it is considered that standard industry measures will be effective at reducing the risk of injury over this distance.

Table 1.84: Potential PTS ranges (m) for marine mammals for geophysical site investigation surveys. Based on comparison to Southall *et al.* (2019) SEL_{cum} thresholds.

¹ Non-impulsive threshold used from Southall *et al.* (2019)

² Impulsive threshold used from Southall *et al.* (2019)

Source	Potential impact range (m) for PTS			
	LF	HF	VHF	PCW
MBES ¹	12	41	68	25
SSS ¹	2	2	41	6
SBES ¹	12	12	68	25
SBP (chirp/ pinger) ¹	40	40	254	40
UHRS (sparker) ²	N/E	N/E	11	N/E

Table 1.85: Potential PTS ranges (m) for marine mammals during geotechnical site investigation surveys. Comparison to Southall *et al.* (2019) SEL_{cum} thresholds (comparison to ranges for SPL_{pk} where threshold was exceeded shown in brackets). N/E = Not exceeded.

Source	Potential impact range (m) for PTS			
	LF	HF	VHF	PCW
Borehole drilling	N/E	N/E	N/E	N/E
Cone penetration testing	4	N/E	55 (14)	N/E
Vibro-coring ¹	N/E	N/E	79	N/E

1.6.4.216 Pre-construction site investigation surveys will involve the use of several geophysical/geotechnical survey vessels. Site-investigation surveys are considered to be short term as they will take place over up to a period of several months (typically up to two months). These will be carried out pre-construction but also may be carried out periodically as part of seabed and cable protection surveys based on consenting requirements.

Behavioural Disturbance

1.6.4.217 The estimated maximum ranges for onset of disturbance are based on sound level being greater than the 120 dB re 1 µPa SPL_{rms} threshold applicable for all Annex II marine mammals species, noting that this threshold is for ‘mild disturbance’ and therefore is not likely to result in long term displacement of animals.

1.6.4.218 The disturbance ranges as a result of geophysical and geotechnical site-investigation surveys (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)) will be higher than those presented for PTS. Most of the predicted ranges are within 100s of meters, however the largest distance over which the disturbance could occur is out to approximately 17.3 km for a SBP, during geophysical survey activities. This is due to the higher source levels for this piece of equipment compared to other types of survey equipment. This could lead to maximum disturbance of up to 247 harbour porpoise, 2 bottlenose dolphin, 39 grey seal, but less than one harbour seal. For geotechnical surveys, the maximum disturbance ranges were predicted for the vibro-coring with mild disturbance potentially up to 8,845 km. This could lead to maximum disturbance of up to 65 harbour porpoise and 11 grey seal. For bottlenose dolphin and harbour seal, less than one animal has the potential to be disturbed. For impulsive sound sources (UHRS (sparker) and CPT), the largest distance over which mild disturbance could occur is out to 1,350 m, and the largest distance over which strong disturbance could occur is out to 158 m. Quantitatively, for CPT, this would lead to maximum disturbance of up to two harbour porpoise. For all other Annex II marine mammal species, less than one animal has the potential to be disturbed.

1.6.4.219 For impulsive sound sources, there is an understanding of the difference between strong and mild disturbance, whereas for non-impulsive (continuous) sound sources, there is only a single available threshold (120 dB re 1 µPa SPL_{rms}), which is classed as the distance beyond which no animals would be disturbed. Given that ranges for disturbance for non-impulsive sound sources (MBES, SSS, SBES, SBP (chirp/pinger), borehole drilling and vibro-coring), are presented up to the 120 dB re 1 µPa (SPL_{rms}) threshold, and there is no distinction between mild and strong disturbance, it can be assumed that not all animals found within those ranges would be disturbed. Moreover,

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for those animals disturbed, there is likely to be a proportional response (i.e. not all animals will be disturbed to the same extent), although there is no dose-response curve available to apply in the context of non-impulsive sound sources. It is important to note that the life history of an individual and the context will also influence the likelihood of an individual to exhibit an aversive response to sound, and it must be highlighted that these impacts will not be continuous over the construction phase, instead carried out over a shorter number of days within the period. Therefore, given the limited quantitative information available, as described above, any simplified calculation would likely lead to an unrealistic overestimation of the number of animals likely to be disturbed. As such, this value has not been quantified.

- 1.6.4.220 However, all geotechnical and geophysical surveys will be of a very short duration (over a period of several months), activities are likely to be intermittent and animals are expected to recover quickly after cessation of the survey activities. It is expected that, to some extent, marine mammals will be able to adapt their behaviour to reduce impacts on survival and reproduction rates and tolerate elevated underwater sound during pre-construction site investigation surveys.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

- 1.6.4.221 As outlined in paragraph 1.6.4.211, ranges for harbour porpoise within which there is a risk of PTS are small with a maximum of 79 m for geotechnical surveys and 254 m for geophysical surveys. The number of harbour porpoise to potentially experience PTS is less than one animal and the risk of injury reduced with measures adopted as part of the Morgan Generation Assets in place. Since sonar-based systems have strong directivity and the site investigation surveys will be of short term duration and intermittent, there is no adverse effects leading to auditory injury for harbour porpoise associated with elevated underwater sound during pre-construction site investigation surveys for the Morgan Generation Assets.
- 1.6.4.222 For an SBP, during geophysical survey activities, up to 247 harbour porpoise are predicted to potentially be disturbed within the 17.3 km range and for geotechnical surveys, up to 65 harbour porpoise are predicted to potentially be disturbed within the mild disturbance range of 8,845 km (see paragraph 1.6.4.45). Up to two harbour porpoise during UHRS and CPT are predicted to potentially be disturbed within ranges of 1,350 m (mild disturbance) and 158 m (strong disturbance). Given the distance from the Morgan Generation Assets to the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km to Morgan Array Area), it is expected that harbour porpoise will avoid the area of the survey. Noting that pre-construction site investigation surveys will not be undertaken nearby or within this SAC and with harbour porpoise recovering quickly after the surveys have ceased, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.
- 1.6.4.223 Therefore, as described in paragraph 1.6.4.218, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

- 1.6.4.224 It is concluded that no adverse effects on the harbour porpoise features which could undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn

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Forol SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.86. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.86: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>Given that there is no potential for injury to harbour porpoise within range of the SAC, that the sound of vessels is likely to deter animals and that there is likely to be recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site. Harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.</p>

1.6.4.225 Therefore, it can be concluded beyond reasonable scientific doubt that there **is no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

North Channel SAC

Harbour porpoise

1.6.4.226 Impacts of elevated underwater sound during pre-construction site investigation surveys on harbour porpoise features of the North Channel SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area) outlined in paragraphs 1.6.4.36 to 1.6.4.43, due to the proximity of the locations. As the North Channel SAC (64.0 km from the Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.227 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.6.4.228 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which could undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation

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objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.87. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.87: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of vessel is likely to deter animals and that there is likely to be recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site. Harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.</p>

1.6.4.229 Therefore, it can be concluded that beyond reasonable scientific doubt there **is no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Strangford Lough SAC

Harbour seal

1.6.4.230 As outlined in paragraph 1.6.4.211, the range for harbour seal within which there is a risk of PTS is small, with a maximum range of 40 m predicted for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). The number of harbour seal that could potentially experience PTS is less than one animal. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there are no adverse effects leading to auditory injury for harbour seal associated with elevated underwater sound during pre-construction site investigation surveys for the Morgan Generation Assets.

1.6.4.231 Less than one harbour seal is predicted to be potentially disturbed within ranges of 17.3 km for geophysical surveys, 8,845 km during geotechnical surveys and 1,350 m (mild disturbance) for UHRS and CPT. However, considering the distance from the Morgan Generation Assets to the Strangford Lough SAC (94.7 km to the Morgan Array Area), animals within the site are unlikely to be disturbed. It is unlikely that all of the disturbed animals would originate from this SAC and therefore, this number is likely to be an over-estimation of the number of harbour seals from the Strangford Lough SAC affected. Noting that site surveys will not be undertaken nearby or within this SAC and with harbour seals recovering quickly after the surveys have ceased, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the Strangford Lough SAC.

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1.6.4.232 Therefore, the impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of significant behavioural disturbance of harbour seals.

Conclusions

1.6.4.233 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which could undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraph 1.6.2.19) is discussed in Table 1.88. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.88: Conclusions against the conservation objectives of the Strangford Lough SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of the survey vessel is likely to deter animals and that there is likely to be recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys of Morgan Generation Assets will not prevent the population of harbour seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>There is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

1.6.4.234 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound during the pre-construction site investigation surveys for the Morgan Generation Assets alone.

Murlough SAC

Harbour seal

1.6.4.235 Elevated underwater sound during pre-construction site investigation surveys on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (94.7 km from the Morgan Array Area) outlined in paragraphs 1.6.4.48 to 1.6.4.52, due to the proximity of the locations. As the Murlough SAC (98.4 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.236 Therefore, the impact is not predicted to result in auditory injury of harbour seal and there is negligible risk of significant behavioural disturbance of harbour seal.

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Conclusions

1.6.4.237 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which could undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraph 1.6.2.24) is discussed in Table 1.89. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.89: Conclusions against the conservation objectives of the Murlough SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of the survey vessel is likely to deter animals and that there is likely to be recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys for the Morgan Generation Assets will not prevent the population and distribution of harbour seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

1.6.4.238 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Llwyn Peninsula and the Sarnau/Pen Llwyn a'r Sarnau SAC

Bottlenose dolphin

1.6.4.239 As outlined in paragraph 1.6.4.211, the range for bottlenose dolphin within which there is a risk of PTS is small with a maximum range of 41 m for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). The number of bottlenose dolphin that could potentially experience PTS is less than one animal. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there are no adverse effects leading to auditory injury for bottlenose dolphin associated with elevated underwater sound during the pre-construction site investigation surveys for the Morgan Generation Assets.

1.6.4.240 Two bottlenose dolphin are predicted to potentially be disturbed within ranges of 17.3 km for geophysical surveys (SBP), and less than one bottlenose dolphin is predicted to be potentially disturbed within the ranges of 8,845 km during geotechnical surveys (vibro-coring) and during UHRS and CPT, within predicted ranges of 1,350 m (mild disturbance) and 158 m (strong disturbance). However, considering the distance from the Morgan Generation Assets to the Pen Llwyn a'r Sarnau/Llwyn Peninsula and

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the Sarnau SAC (119.7 km to the Morgan Array Area), it is expected that bottlenose dolphins will avoid the area of the survey. Therefore, animals within the site are unlikely to be disturbed. Noting that pre-construction site investigation surveys will not be undertaken near or within this SAC and with bottlenose dolphins recovering quickly after the surveys have ceased, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC.

1.6.4.241 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphin and there is negligible risk of significant behavioural disturbance of bottlenose dolphin.

Grey seal

1.6.4.242 As outlined in paragraph 1.6.4.211, range for grey seal within which there is a risk of PTS is small with a maximum range of 40 m for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). The number of grey seal to potentially experience PTS is less than one animal. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there is no adverse effects leading to auditory injury for grey seal associated with elevated underwater sound during pre-construction site investigation surveys for the Morgan Generation Assets.

1.6.4.243 For grey seal, 39 animals are predicted to potentially be disturbed within ranges of 17.3 km for geophysical surveys (SBP), and less than 11 grey seal are predicted to be potentially disturbed within the ranges of 8,845 km during geotechnical surveys (vibro-coring) and less than one animal is predicted to be potentially disturbed during UHRS and CPT, within predicted ranges of 1,350 m (mild disturbance) and 158 m (strong disturbance). However, considering the distance from the Morgan Generation Assets to the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (119.7 km to the Morgan Array Area), animals within the site are unlikely to be disturbed. Noting that site surveys will not be undertaken near to or within this SAC and with grey seals recovering quickly after the pre-construction surveys have ceased, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC.

1.6.4.244 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of significant behavioural disturbance of grey seal.

Conclusions

1.6.4.245 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin and grey seal features which could undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.90. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.90: Conclusions against the conservation objectives of Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Given that there is no potential for injury within range of the SAC, that vessel sound is likely to deter animals and that there is likely to be recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the populations of bottlenose dolphin or grey seal from being maintained on a long-term basis as a viable component of their natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys for the Morgan Generation Assets will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin and grey seal for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p>

1.6.4.246 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

The Maidens SAC

Grey seal

1.6.4.247 Elevated underwater sound during pre-construction site investigation surveys on grey seal features of The Maidens SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.242 to 1.6.4.246. As The Maidens SAC (142.0 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.248 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of significant behavioural disturbance of grey seal.

Conclusions

1.6.4.249 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraph 1.6.2.55) is discussed in Table 1.91. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.91: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of the survey vessel is likely to deter animals and that there is likely to be recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys of Morgan Generation Assets will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by grey seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent physical features used by grey seal within the site from being maintained or enhance.</p>

1.6.4.250 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.4.251 Elevated underwater sound during pre-construction site investigation surveys on bottlenose dolphin features of the Cardigan Bay/Bae Ceredigion SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from the Morgan Array Area) outlined in paragraphs 1.6.4.242 to 1.6.4.246. As the Cardigan Bay/Bae Ceredigion SAC (188.1 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.252 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphin and there is negligible risk of significant behavioural disturbance of bottlenose dolphin.

Grey seal

1.6.4.253 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.4.274.

Conclusions

1.6.4.254 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin features which could undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each

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relevant conservation objective (as presented in paragraphs 1.6.2.61 to 1.6.2.65) is discussed in Table 1.92. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.92: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of vessel is likely to deter animals and that there is likely recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys for Morgan Generation Assets will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>

1.6.4.255 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.6.4.256 Impacts from elevated underwater sound during pre-construction site investigation surveys on grey seal features of the Pembrokeshire Marine/Sir Benfro Forol SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from the Morgan Array Area) outlined in paragraphs 1.6.4.242 to 1.6.4.246. As the Pembrokeshire Marine/Sir Benfro Forol SAC (237.3 km from the Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.257 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.6.4.258 It is concluded that no adverse effects on the qualifying Annex II grey seal features which could undermine the conservation objectives of the Pembrokeshire Marine/Sir

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Benfro Forol SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraphs 1.6.2.71 to 1.6.2.74) is discussed in Table 1.93. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.93: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of vessel is likely to deter animals and that there is likely recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the populations of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys for Morgan Generation Assets will not reduce nor likely reduce the natural range of the populations of grey seal for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of grey seal.</p>

1.6.4.259 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.4.260 Impacts from elevated underwater sound during pre-construction site investigation surveys on harbour porpoise features of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area) outlined in paragraphs 1.6.4.36 to 1.6.4.43. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (300.5 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

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1.6.4.261 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.6.4.262 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraphs 1.6.2.79 to 1.6.2.80) is discussed in Table 1.94. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.94: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>Given that there is no potential for injury within range of the SAC, that the sound of the vessel is likely to deter animals and that there is likely recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site. Harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.</p>

1.6.4.263 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Lundy SAC

Grey seal

1.6.4.264 Impacts from elevated underwater sound during pre-construction site investigation surveys on grey seal features of the Lundy SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.242 to 1.6.4.246. As the Lundy SAC (335.1 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen

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Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.265 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.6.4.266 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraphs 1.6.2.85 to 1.6.2.87) is discussed in Table 1.95. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.95: Conclusions against the conservation objectives of the Lundy SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored or prevent the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>Given that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the population and distribution of grey seal from being maintained or restored.</p>

1.6.4.267 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Isles of Scilly Complex SAC

Grey seal

1.6.4.268 Impacts from elevated underwater sound during pre-construction site investigation surveys on grey seal features of the Isles of Scilly Complex SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.242 to 1.6.4.246. As the Isles of Scilly Complex SAC (464.9 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn

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Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.269 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of significant behavioural disturbance of grey seal.

Conclusions

1.6.4.270 It is concluded that no adverse effects on the qualifying Annex II grey seal features which could undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys. An assessment of the impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (as presented in paragraphs 1.6.2.92 to 1.6.2.94) is discussed in Table 1.96. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.96: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for elevated underwater sound during pre-construction site investigation surveys.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored or prevent the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>Given that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets will not prevent the population and distribution of grey seal from being maintained or restored.</p>

1.6.4.271 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound during pre-construction site investigation surveys from the Morgan Generation Assets alone.

Sites assessed in line with the iterative approach

1.6.4.272 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Part 2 – SAC assessments, are located at a

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greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.4.221 to 1.6.4.271 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.4.273 to 1.6.4.295.

West Wales Marine/Gorllewin Cymru Forol SAC

- 1.6.4.273 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

- 1.6.4.274 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.4.242 to 1.6.4.246), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Rockabill to Dalkey Island SAC

- 1.6.4.275 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Saltee Islands SAC

- 1.6.4.276 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.4.242 to 1.6.4.246), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Roaringwater Bay and Islands SAC

- 1.6.4.277 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the

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Roaringwater Bay and Islands SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Blasket Islands SAC

1.6.4.278 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.6.4.279 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Abers - Côte des legends SCI

1.6.4.280 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Abers - Côte des legends SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Ouessant-Molène SCI

1.6.4.281 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Côte de Granit rose-Sept-Iles SCI

1.6.4.282 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

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Anse de Goulven, dunes de Keremma SCI

- 1.6.4.283 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Tregor Goëlo SCI

- 1.6.4.284 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Côtes de Crozon SCI

- 1.6.4.285 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Chaussée de Sein SCI

- 1.6.4.286 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Cap Sizun SCI

- 1.6.4.287 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Récifs du talus du golfe de Gascogne SCI

- 1.6.4.288 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable

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scientific doubt there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Anse de Vauville SCI

1.6.4.289 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Cap d'Erquy-Cap Fréhel SCI

1.6.4.290 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Baie de Saint-Brieuc – Est SCI

1.6.4.291 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Banc et récifs de Surtainville SCI

1.6.4.292 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.4.293 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

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Estuaire de la Rance SCI

- 1.6.4.294 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Baie du Mont Saint-Michel SCI

- 1.6.4.295 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.221 to 1.6.4.229), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets alone.

Injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other (non-piling) sound producing activities

- 1.6.4.296 The assessment of LSE during in the HRA Stage 1 Screening Report (Document Reference E1.4) identified that during construction, operations/maintenance and decommissioning LSE could not be ruled out for the potential impact of elevated underwater sound, due to vessel use and other (non-piling) sound producing activities. This relates to the designated sites listed in Table 1.2 and relevant Annex II marine mammal features. The assessment is undertaken as an iterative approach and considers the closest site in the first instance and the sites suggested in NRW (2022d).
- 1.6.4.297 Non-piling, sound producing activities and increased vessel movements during the construction, operations/maintenance and decommissioning phases have the potential to result in a range of impacts on marine mammals such as avoidance behaviour or displacement and masking of vocalisations or changes in vocalisation rate. During the construction phase of the Morgan Generation Assets, the increased levels of vessel activity will contribute to the total underwater sound levels, but the movements will be limited to within the Morgan Array Area and will follow existing shipping routes where possible to/from the ports.
- 1.6.4.298 Vessel use during the operations and maintenance phase of the Morgan Generation Assets may lead to injury and/or disturbance to Annex II marine mammals species. A variety of vessel types will be used during routine operations and maintenance activities, including Crew Transfer Vessels (CTVs)/workboats, jack-up vessels, cable repair vessels, Service Operation Vessels (SOVs) or similar vessels and excavators/backhoe dredgers.
- 1.6.4.299 The assessment of potential impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities is based on vessel and/or activity basis, considering the maximum injury/disturbance range as assessed in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1). However, several activities could be potentially occurring at the same time and therefore ranges of effects may extend from several vessels/locations where the activity is carried out and potentially overlap.

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- 1.6.4.300 From underwater sound emitted by vessels, the main drivers influencing the magnitude of the potential impact are vessel type, speed and ambient sound levels (Wilson *et al.*, 2007). Baseline levels of vessel traffic around the Morgan Array Area are at a high level, largely due to ferry routes but also due occasional vessel traffic movements associated with jack-ups and other platforms occurring in the region (see Volume 4, Annex 7.1: Navigational Risk Assessment of the Environmental Statement (Document Reference F4.7.1)).
- 1.6.4.301 The MDS considered for the assessment of potential impacts on Annex II marine mammal features from elevated underwater sound due to vessel use and other (non-piling) sound producing activities is presented in Table 1.97.

Table 1.97: Maximum design scenario considered for the assessment of potential impacts on marine mammals from elevated underwater sound due to vessel use and other (non-piling) sound producing activities.

Phase	Maximum design scenario	Justification
Construction phase	<p>Vessels</p> <ul style="list-style-type: none"> Up to a total of 69 construction vessels on site at any one time (22 main installation and support vessels, eight tug/anchor handlers, seven cable lay installation and support vessels, one guard vessel, six survey vessels, eight seabed preparation vessels, 12 CTVs, three scour protection installation vessels and two cable protection installation vessels) Up to 1,929 installation vessel movements (return trips) during construction (521 main installation and support vessels, 74 tug/anchor handlers, 56 cable lay installation and support vessels, 50 guard vessel, 31 survey vessels, 19 seabed preparation vessels, 1,135 CTVs, 41 scour protection installation vessels and two cable protection installation vessels). <p>Other activities:</p> <ul style="list-style-type: none"> Up to 100% of overall piles are anticipated to require drilling (64, four-legged wind turbine jacket foundations with a diameter of 3.8 m and 4, four-legged OSP jacket foundations with a diameter of 3.5 m), up to 2 concurrent drilling vessels Burial of up to 390 km of inter-array cables and 60 km of interconnector cables via ploughing, trenching and jetting; protection of up to 39 km of inter-array cables and 12 km of interconnector cables via steel armour wire, rock dump and matting. <p>Maximum offshore construction duration of up to four years.</p>	<p>The MDS considers the maximum number of vessels on site at any one time and greatest number of round trips during each phase of the Morgan Generation Assets. This represents the broadest range of vessel types and therefore sound signatures within the marine environment to affect marine mammal receptors.</p> <p>The MDS considers the maximum durations for which activities could be conducted.</p>
Operations and maintenance phase	<ul style="list-style-type: none"> Up to a total of 16 operations and maintenance vessels on site at any one time (five CTVs/workboats, three jack-up vessels, three cable repair vessels, four SOVs or similar and one excavator/backhoe dredger) Up to 719 operations and maintenance vessel movements (return trips) each year (608 CTVs/workboats, 25 jack-up vessels, six cable repair vessels, 78 SOVs or similar and two excavators/backhoe dredgers) Operational lifetime of up to 35 years. 	

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Phase	Maximum design scenario	Justification
Decommissioning phase	<ul style="list-style-type: none"> • Vessels used for a range of decommissioning activities such as removal of foundations • Sound from vessels assumed to be as per vessel activity described for construction phase above. 	

Measures adopted as part of the Morgan Generation Assets

1.6.4.302 The measures adopted as part of the Morgan Generation Assets that are relevant to effects from elevated underwater sound due to vessel use and other (non-piling) sound producing activities are outlined in Table 1.56.

Construction and decommissioning phases

Information to support assessment

1.6.4.303 The MDS for construction activities associated with the Morgan Array Area, is up to a total of 69 vessels on site at any one time. This includes maximum of 22 main installation and support vessels, carrying out 521 trips. Eight tug/anchor handlers will carry out 74 return trips. Seven cable lay installation and support vessels will carry out 56 return trips across the total construction period. One guard vessel will carry out 50 return trips. Six survey vessels will carry out 31 return trips. Maximum of eight seabed preparation vessels for boulder removal, grapnel, pre-sweep and levelling will carry out 19 return trips. Twelve CTVs will carry out 1,135 return trips. Three scour protection installation vessels will carry out 41 return trips, and two cable protection vessels will carry out two return trips (see Table 1.97).

1.6.4.304 Whilst this will lead to an uplift in vessel activity, the movements will be limited to within the Morgan Array Area and will follow existing shipping routes where possible to and from the ports. Approximately 3,166 vessels in total pass through the Morgan Array Area per year (from Navigational Risk Assessment (NRA) in Volume 4, Annex 7.1: Navigational Risk Assessment of the Environmental Statement (Document Reference F4.7.1)).

1.6.4.305 Vessel traffic activity shows a seasonal trend that peaks over the summer months (May to Aug) and decreases in the winter months (November to February) (Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). This is primarily due to an increase in ferry service operations and recreational activity. The NRA demonstrated much of the Morgan marine mammal study area experienced over 640 vessel trips per year (Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). The majority of vessels crossing the Morgan Array Area are commercial cargo, tanker and passenger vessels and commercial traffic is largely concentrated where the route crosses the approaches to Liverpool and the associated ferry routes. The vessel movements associated with the Morgan Generation Assets will be contained within the Morgan Array Area and will follow existing shipping routes where possible to and from the ports.

Auditory injury

1.6.4.306 A detailed underwater sound modelling assessment has been carried out to investigate the potential for injurious and behavioural effects on marine mammals resulting from elevated underwater sound (non-impulsive sound), using the latest criteria (see Volume 3, Annex 3.1: Underwater sound technical report of the

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Environmental Statement (Document Reference F3.3.1). A conservative assumption has been made that all individual marine mammals will respond aversively to increases in vessel sound (i.e. that there is no intra or inter-specific variation or context-dependent differences). The distance over which effects may occur will, however, vary according to the species, the ambient sound levels, hearing ability, vertical space use and behavioural response differences.

- 1.6.4.307 SELs have been estimated for each vessel type based on 24 hours continuous operation, although it is important to note that it is highly unlikely that any marine mammal would stay at a stationary location or within a fixed radius of a vessel for 24 hours. Therefore, the acoustic modelling has been undertaken based on an animal swimming away from the source (or the source moving away from an animal). The sound modelling results indicate that the threshold for PTS was not exceeded for any species for all vessels, drilled piling and all cable burial activities. The sound modelling results presented in Volume 2 Chapter 4 marine mammals of the Environmental Statement (Document Reference F2.4) indicated that there is no risk of PTS occurring to marine mammals as a result of elevated underwater sound due to vessel use, drilled piling or cable burial activities. Acoustic modelling was conducted for TTS for completeness (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1), however ranges indicated are likely to be overestimates. Ranges for TTS were between <10 m and 145 m for vessels (based on harbour porpoise), and between <10 m and 145 m for drilled piling and cable burial activities. Whilst the likelihood of auditory injury to animals is considered unlikely, the maximum duration of the construction phase is up to four years (48 months).

Behavioural disturbance

- 1.6.4.308 Disturbance from vessel sound is likely to occur only where vessel sound associated with the construction of the Morgan Generation Assets exceeds the background ambient sound level. The Morgan Generation Assets is located in a relatively busy shipping area and therefore background sound levels are likely to be relatively high. (see paragraph 1.6.4.300).
- 1.6.4.309 A detailed underwater sound modelling assessment has been carried out to investigate the potential for behavioural effects on marine mammals resulting from increased vessel sound and other activities (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1)). The estimated ranges within which there is a potential for disturbance to a marine mammal are presented in Table 1.98.
- 1.6.4.310 Survey and support vessels, CTVs and scour/cable protection/seabed preparation/installation vessels resulted in the greatest modelled disturbance out to 3,627 m for all marine mammal species. The greatest disturbance range for other non-vessel continuous sound behavioural effects was predicted to be 2,270 m due to underwater sound from cable laying activities. In comparison, sandwave clearance, installation vessels, construction vessels (Dynamic Positioning (DP), rock placement vessels and cable installation vessels also all resulted in a predicted disturbance range of 2,270 m; vessels for boulder clearance and offshore construction vessel had a disturbance range of 340 m; tug/anchor handlers had a disturbance range of 1,354 km; and jack up rigs had a disturbance range of <10 m.

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Table 1.98: Estimated disturbance ranges for marine mammals as a result of vessels and other (non-piling) sound producing activities, based on the NMFS sound threshold value for continuous sound (120 dB re 1 μ Pa SPL_{rms}).

Threshold	Disturbance range (m)
Vessels	
Survey vessel and support vessel, CTV, scour/cable protection/seabed preparation/installation vessel	3,627
Sandwave clearance, installation vessel, construction vessel (DP), rock placement vessel and cable installation vessel	2,270
Tug/anchor handler, guard vessel	1,354
Boulder clearance, offshore construction vessel	340
Jack-up rig	<10
Other activities	
Cable trenching	3,119
Cable laying	2,270
Drilled piling	390
Jack-up rig	N/E

- 1.6.4.311 Ranges for disturbance for vessels are presented up to the 120 dB re 1 μ Pa SPL_{rms} threshold, and there is no differentiation between mild and strong disturbance for continuous sound (just one single fixed threshold for Level B harassment), this assumes 100% of animals above this threshold are disturbed (the single step-function criterion used in the NMFS thresholds assume a 'all-or-none' threshold). However, in reality, for those animals disturbed there is likely to be a proportional no dose-response curve available to apply in context of non-impulsive sound sources for key species in the Irish Sea. Dose-response curves for vessels have been created for killer whales (Joy *et al.*, 2019), thus indicating there is evidence of proportional response to vessel sound.
- 1.6.4.312 It is important to note that the life history of an individual and the context will also influence the likelihood of an individual to exhibit an aversive response to sound, and it must be highlighted that these impacts will not be continuous over the four-year construction programme. Therefore, given the limited quantitative information available, as described above, any simplified calculation would likely lead to an unrealistic overestimation of the number of animals likely to be disturbed. Multiplying the area of ensonification by each species' specific density would lead to unrealistic estimates, as serious disturbance would not occur over ranges such as 3,627 m. As such, this value has not been quantified.
- 1.6.4.313 Whilst it is difficult to quantify the response ranges based on a simple threshold approach (e.g. because it does not take into account context), empirical evidence suggests that for similar areas with existing vessel traffic, acoustic activity (and therefore presence of some marine species) may be reduced. Benhemma-Le Gall *et al.* (2021) suggested increased vessel activity (and other construction activities) led to a decrease in porpoise acoustic detections and activity at distances of up to 4 km. Porpoise responses decreased as the mean vessel distance increased (-24% at 3 km) until no apparent response was observed at 4 km. Similarly, McQueen *et al.* (2020)

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used a distance threshold of 5 km as a point of comparison for screening potential marine mammal habitat displacement (behavioural avoidance), based upon the relative size of the dredging area and habitat range of receptors. Verboom *et al.* (2014) also suggested a porpoise never approached the study dredging ship in full operation at less than 5 km. Wisniewska *et al.* (2018) used sound and movement recording tags to detect fine-scale responses in harbour porpoise to vessel sound, and determined that foraging may be temporarily disrupted up to 7 km. Graham *et al.* (2019) indicated higher vessel activity within 1 km was significantly associated with an increased probability of response in harbour porpoise.

1.6.4.314 Therefore, to give quantitative indication of impact, a range of distances from empirical studies (1 to 7 km) have been used as an effective impact range and the numbers of animals predicted to be disturbed is presented in Table 1.99 (noting this distance is based upon VHF species and does not account for different hearing groups, but is likely to be precautionary). The numbers disturbed presented are more likely to be the case for fast moving vessels such as a CTV (of which there are a max of 14 on site at one time) and not for slow-moving vessels such as boulder clearance or jack up rigs that show much smaller modelled disturbance ranges.

Table 1.99 Potential number of animals predicated to be disturbed per vessel for a range between 1 km (minimum) and 7 km (maximum).

Species	Number of animals disturbed (1 km)	% MU	Number of animals disturbed (7 km)	% MU
Harbour porpoise	<1	0.001%	41	0.07%
Bottlenose dolphin	<1	0.001%	<1	0.07%
Grey seal	<1	0.001% 0.00000002%	7	0.05% 0.0000008%
Harbour seal	<1	0.00001%	<1	0.0005%

1.6.4.315 The potential impact, for injury and disturbance, is predicted to be of local spatial extent, medium term duration and intermittent. Given the existing levels of vessel activity in the area, it is expected that marine mammals could tolerate the effects of disturbance without any potential impact on reproduction and survival rates and would return to previous activities once the potential impact had ceased.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.6.4.316 As outlined in paragraph 1.6.4.307, the sound modelling results indicate that the threshold for PTS was not exceeded for any species for all vessels, drilled piling and all cable burial activities. Since other activities and vessel traffic will be short term duration and intermittent, there are no adverse effects leading to auditory injury for harbour porpoise associated with elevated underwater sound due to vessel use and other (non-piling) sound producing activities for Morgan Generation Assets. Ranges for TTS were between <10 m and 145 m for vessels (based on harbour porpoise), and between <10 m and 145 m for drilled piling and cable burial activities. Whilst the likelihood of auditory injury is extremely low, the maximum duration of the construction phase is up to four years (48 months).

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- 1.6.4.317 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For harbour porpoise, less than one animal was predicted to potentially be disturbed (using a 1 km impact range) and 41 animals (using a 7 km impact range).
- 1.6.4.318 Activities and vessel movements will be restricted to the Morgan Array Area, and large vessels, producing low frequency sound, will follow existing shipping routes where possible. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Morgan Generation Assets may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.
- 1.6.4.319 Therefore, the impact is not predicted to result in auditory injury of harbour porpoises and there is negligible risk of significant behavioural disturbance of harbour porpoises (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)).

Conclusions

- 1.6.4.320 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which could undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.100. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.100: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely to be recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The condition of supporting habitats and processes, and the availability of prey is maintained.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the supporting habitats and processes from being maintained or reduce the availability of prey.</p>

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1.6.4.321 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

North Channel SAC

Harbour porpoise

1.6.4.322 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on harbour porpoise features of the North Channel SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area) outlined in paragraphs 1.6.4.316 to 1.6.4.321. As the North Channel SAC (64 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.323 Therefore, the potential impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.6.4.324 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.101. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.101: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The condition of supporting habitats and processes, and the availability of prey is maintained.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan</p>

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Conservation Objective	Conclusion
	Generation Assets will not prevent the supporting habitats and processes from being maintained or reduce the availability of prey.

1.6.4.325 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Strangford Lough SAC

Harbour seal

1.6.4.326 Maximum range for harbour seal within which there is a risk of PTS do not exceed the thresholds. The potential for harbour seal to experience PTS is less than one animal. Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for harbour seal associated with elevated underwater sound due to vessel use and other (non-piling) sound producing activities for Morgan Generation Assets.

1.6.4.327 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For harbour seal less than one animal was predicted to potentially be disturbed (using a 1 km and 7 km impact range).

1.6.4.328 Given the distance from the Morgan Generation Assets to the Strangford Lough SAC (94.7 km to Morgan Array Area), there is no overlap between the potential disturbance impact zone and the SAC and harbour seal within the site are unlikely to be disturbed. Activities and vessel movements will be restricted to the Morgan Array Area and large vessels, producing low frequency sound, will follow existing shipping routes where possible. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Morgan Generation Assets may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to be significant (see paragraph 1.6.4.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

1.6.4.329 Therefore, the potential impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.6.4.330 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.19) is discussed in Table 1.102. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.102: Conclusions against the conservation objectives of the Strangford Lough SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition.</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal population from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will prevent physical features used by harbour seal within the site from being maintained or enhance.</p>

1.6.4.331 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Murlough SAC

Harbour seal

1.6.4.332 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (94.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.346 to 1.6.4.331. As the Murlough SAC (98.4 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.333 Therefore, the potential impact is not predicted to result in auditory injury of harbour seal and there is negligible risk of behavioural disturbance of harbour seal.

Conclusions

1.6.4.334 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.24) is discussed in Table 1.103. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.103: Conclusions against the conservation objectives of the Murlough SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition.</p> <p>Maintain and enhance, as appropriate, the harbour seal population.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal population numbers and distribution from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will prevent physical features used by harbour seal within the site from being maintained or enhance.</p>

1.6.4.335 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Llwyn Peninsula and the Sarnau/Pen Llwyn a'r Sarnau SAC

Bottlenose dolphin

1.6.4.336 Maximum range for bottlenose dolphin within which there is a risk of PTS do not exceed the thresholds. The potential for bottlenose dolphin to experience PTS is less than one animal. Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for bottlenose dolphin associated with elevated underwater sound due to vessel use and other (non-piling) sound producing activities for the Morgan Generation Assets.

1.6.4.337 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For bottlenose dolphin less than one animal was predicted to potentially be disturbed (using both a 1 km and 7 km impact range).

1.6.4.338 Activities with the largest disturbance ranges, including sandwave clearance installation, construction, rock placement and cable laying vessels will be operating at distances from the coastline of Llwyn Peninsula and the Sarnau/Pen Llwyn a'r Sarnau SAC and are unlikely to affect coastal bottlenose dolphin populations. Given the distance from the Morgan Generation Assets to the Llwyn Peninsula and the Sarnau/Pen Llwyn a'r Sarnau SAC (119.7 km to Morgan Array Area), there is no overlap between the potential disturbance impact zone and the SAC and bottlenose dolphin within the site are unlikely to be disturbed. Activities and vessel movements will be restricted to the Morgan Array Area, and large vessels, producing low frequency sound, will follow existing shipping routes where possible. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Morgan Generation Assets may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to

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be significant (see paragraph 1.6.4.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

- 1.6.4.339 Therefore, the potential impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Grey seal

- 1.6.4.340 Maximum range for grey seal within which there is a risk of PTS do not exceed the thresholds. Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for bottlenose dolphin associated with elevated underwater sound due to vessel use and other (non-piling) sound producing activities for the Morgan Generation Assets.

- 1.6.4.341 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For grey seal less than one animal was predicted to potentially be disturbed (using a 1 km impact range) and 7 animals (using a 7 km impact range).

- 1.6.4.342 Given the distance from the Morgan Generation Assets to the Lley Peninsula and the Sarnau/Pen Lley a'r Sarnau SAC (119.7 km to Morgan Array Area), there is no overlap between the potential disturbance impact zone and the SAC and grey seal within the site are unlikely to be disturbed. Activities and vessel movements will be restricted to the Morgan Array Area, and large vessels, producing low frequency sound, will follow existing shipping routes where possible. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Morgan Generation Assets may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to be significant (see paragraph 1.6.4.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

- 1.6.4.343 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

- 1.6.4.344 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin and grey seal features which undermine the conservation objectives of the Lley Peninsula and the Sarnau/Pen Lley a'r Sarnau SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.104. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.104: Conclusions against the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as a viable component of their natural habitats. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not reduce nor likely reduce for the foreseeable future the natural ranges of the populations of bottlenose dolphin and grey seal.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p>

1.6.4.345 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

The Maidens SAC

Grey seal

1.6.4.346 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of The Maidens SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.340 to 1.6.4.345. As The Maidens SAC (142.0 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.347 Therefore, the potential impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

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Conclusions

1.6.4.348 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.55) is discussed in Table 1.105. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.105: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the grey seal population numbers and distribution from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the physical features used by grey seal within the site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will prevent physical features used by grey seal within the site from being maintained or enhance.</p>

1.6.4.349 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.4.350 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on bottlenose dolphin features of the Cardigan Bay/Bae Ceredigion SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.340 to 1.6.4.345. As the Cardigan Bay/Bae Ceredigion SAC (188.1 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.351 Therefore, the potential impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

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Grey seal

1.6.4.352 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.4.373.

Conclusions

1.6.4.353 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.61 to 1.6.2.65) is discussed in Table 1.106. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.106: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not reduce nor likely reduce for the foreseeable future the natural range of the population of bottlenose dolphin.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>

1.6.4.354 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

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Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

- 1.6.4.355 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Pembrokeshire Marine/Sir Benfro Forol SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.340 to 1.6.4.345. As the Pembrokeshire Marine/Sir Benfro Forol SAC (237.3 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.
- 1.6.4.356 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

- 1.6.4.357 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.71 to 1.6.2.74) is discussed in Table 1.107. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.107: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not reduce nor likely reduce for the foreseeable future the natural range of the population of grey seal.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not</p>

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Conservation Objective	Conclusion
	affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying grey seal feature.

1.6.4.358 Therefore, it can be concluded that beyond reasonable scientific doubt **there is no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.4.359 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on harbour porpoise features of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area) outlined in paragraphs 1.6.4.316 to 1.6.4.321. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (300.5 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.360 Therefore, the potential impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.6.4.361 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.79 to 1.6.2.80) is discussed in Table 1.108. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.108: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling)</p>

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Conservation Objective	Conclusion
	sound producing activities associated with the Morgan Generation Assets will not significantly disturb harbour porpoise.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the supporting habitats and processes from being maintained or reduce the availability of prey.

1.6.4.362 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Lundy SAC

Grey seal

1.6.4.363 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Lundy SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.340 to 1.6.4.345. As the Lundy SAC (335.1 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.364 Therefore, the potential impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.6.4.365 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.85 to 1.6.2.87) is discussed in Table 1.109. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.109: Conclusions against the conservation objectives of the Lundy SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the distribution of grey seal from being maintained or restored.</p>

1.6.4.366 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Isles of Scilly Complex SAC

Grey seal

1.6.4.367 Impacts from, elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Isles of Scilly Complex SAC are predicted to be similar to those associated with the Lley Peninsula and the Sarnau/Pen Lley a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.340 to 1.6.4.345. As the Isles of Scilly Complex SAC (464.9 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lley Peninsula and the Sarnau/Pen Lley a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.368 Therefore, the potential impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.6.4.369 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.92 to

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1.6.2.94) is discussed in Table 1.110. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.110: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the distribution of grey seal from being maintained or restored.</p>

1.6.4.370 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Sites assessed in line with the iterative approach

1.6.4.371 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Report Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.4.316 to 1.6.4.370 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.4.372 to 1.6.4.394.

West Wales Marine/Gorllewin Cymru Forol SAC

- 1.6.4.372 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

- 1.6.4.373 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.4.340 to 1.6.4.345), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Rockabill to Dalkey Island SAC

- 1.6.4.374 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Saltee Islands SAC

- 1.6.4.375 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.4.340 to 1.6.4.345), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Roaringwater Bay and Islands SAC

- 1.6.4.376 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

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Blasket Islands SAC

- 1.6.4.377 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

- 1.6.4.378 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Abers - Côte des legends SCI

- 1.6.4.379 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Abers - Côte des legends SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Ouessant-Molène SCI

- 1.6.4.380 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Côte de Granit rose-Sept-Iles SCI

- 1.6.4.381 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Anse de Goulven, dunes de Keremma SCI

- 1.6.4.382 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

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SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Tregor Goëlo SCI

1.6.4.383 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Côtes de Crozon SCI

1.6.4.384 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Chaussée de Sein SCI

1.6.4.385 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Cap Sizun SCI

1.6.4.386 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Récifs du talus du golfe de Gascogne SCI

1.6.4.387 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel

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use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Anse de Vauville SCI

1.6.4.388 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Cap d'Erquy-Cap Fréhel SCI

1.6.4.389 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Baie de Saint-Brieuc – Est SCI

1.6.4.390 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Banc et récifs de Surtainville SCI

1.6.4.391 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.4.392 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

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Estuaire de la Rance SCI

- 1.6.4.393 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Baie du Mont Saint-Michel SCI

- 1.6.4.394 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.316 to 1.6.4.325), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets alone.

Operations and maintenance phase

Information to support assessment

- 1.6.4.395 Vessel use during the operations and maintenance phase of the Morgan Generation Assets may lead to injury and/or disturbance to marine mammals. Vessel types which will be required during the operations and maintenance phase include those used during routine inspections, geophysical surveys, repairs and replacements of navigational equipment, removal of marine growth, replacement of corrosion protection anodes, painting, replacement of access ladders and boat landings, modifications to/replacement of J-tubes, replacement of consumables, minor repairs and replacements to wind turbines or OSPs, major component replacement to wind turbines or OSP or inter-array/interconnector cable repair. This will involve CTVs/workboats, jack up vessels, cable repair vessels, SOVs or similar vessels and excavators/backhoe dredgers. Up to a maximum of 16 vessels will be on site at any one time, with 719 operations and maintenance vessel movements (return trips) will be carried out each year (608 CTVs/workboats, 25 jack-up vessels, six cable repair vessels, 78 SOVs or similar and two excavators/backhoe dredgers).
- 1.6.4.396 The uplift in vessel activity during the operations and maintenance phase is considered to be relatively small in the context of the baseline levels of vessel traffic in the Morgan marine mammal study area. Presence of the operational wind farm Morgan Generations Assets may divert some of the shipping routes and therefore, current traffic within the Morgan Array Area, which is not associated with Morgan Generation Assets, is likely to be reduced. It is likely that this reduction will be ultimately counterbalanced by presence of maintenance vessels. Vessel movements within the Morgan Array Area will follow the provisions for vessels and vessel movements within the Offshore EMP (which includes measures to minimise disturbance to marine mammals and rafting birds from transiting vessels).
- 1.6.4.397 The size and sound outputs from vessels during the operations and maintenance phase will be similar to those used in the construction phase and therefore will result in a similar spatial MDS. However, the number of vessel round trips and their frequency is much lower for the operations and maintenance phase compared to the construction phase.

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1.6.4.398 An overview of potential impacts for auditory injury and behavioural disturbance to marine mammals from elevated underwater sound due to vessel use and other (non-piling) sound producing activities is described in paragraphs 1.6.4.315 to 1.6.4.319 for the construction phase with similar impact ranges and have not been reiterated here for the operations and maintenance phase. The potential impacts are predicted to be of local spatial extent, long term duration and intermittent.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.6.4.399 On the basis of the rationale outlined in paragraphs 1.6.4.306 to 1.6.4.315 for the construction phase potential impact, and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.6.4.400 Therefore, the potential impact is not predicted to result in auditory injury of harbour porpoises and there is negligible risk of behavioural disturbance of harbour porpoises.

Conclusions

1.6.4.401 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which could undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.111. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.111: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The condition of supporting habitats and processes, and the availability of prey is maintained.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the harbour porpoise. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of elevated underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the condition of the habitats and their processes and the availability of prey from being maintained.</p>

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1.6.4.402 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

North Channel SAC

Harbour porpoise

1.6.4.403 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on harbour porpoise features of the North Channel SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area) outlined in 1.6.4.399 to 1.6.4.402, due to the proximity of the locations. As the North Channel SAC (64 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.404 Therefore, the potential impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.6.4.405 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.112. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.112: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The condition of supporting habitats and processes, and the availability of prey is maintained.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of harbour porpoise. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of elevated underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not</p>

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Conservation Objective	Conclusion
	prevent the condition of the habitats and their processes and the availability of prey from being maintained.

1.6.4.406 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Strangford Lough SAC

Harbour seal

1.6.4.407 On the basis of the rationale outlined in paragraphs 1.6.4.397 to 1.6.4.399 for the construction phase potential impact and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.6.4.408 Therefore, the potential impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.6.4.409 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which could undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.19) is discussed in Table 1.113. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.113: Conclusions against the conservation objectives of the Strangford Lough SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition Maintain and enhance, as appropriate, the harbour seal population	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site	There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound

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Conservation Objective	Conclusion
	producing activities associated with the Morgan Generation Assets will prevent physical features used by harbour seal within the site from being maintained or enhanced.

1.6.4.410 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Murlough SAC

Harbour seal

1.6.4.411 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (94.7 km from the Morgan Array Area) outlined in paragraphs 1.6.4.407 to 1.6.4.410, due to the proximity of the locations. As the Murlough SAC (98.4 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.412 Therefore, the potential impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.6.4.413 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which could undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.24) is discussed in Table 1.114. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.114: Conclusions against the conservation objectives of the Murlough SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population and distribution of harbour seal from being maintained or enhanced.</p>

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Conservation Objective	Conclusion
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

1.6.4.414 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC

Bottlenose dolphin

1.6.4.415 On the basis of the rationale outlined in paragraphs 1.6.4.397 to 1.6.4.399 for the construction phase potential impact, and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.6.4.416 Therefore, the potential impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Grey seal

1.6.4.417 On the basis of the rationale outlined in paragraphs 1.6.4.397 to 1.6.4.399 for the construction phase potential impact, and the lower number of vessels and other activities associated with the operations/maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.6.4.418 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.6.4.419 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin and grey seal features which could undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.115. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.115: Conclusions against the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC for elevated underwater sound due to

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vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as a viable component of their natural habitats. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not reduce nor likely reduce for the foreseeable future the natural range of the populations of bottlenose dolphin and grey seal.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p>

1.6.4.420 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

The Maidens SAC

Grey seal

1.6.4.421 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Maidens SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.415 to 1.6.4.420, due to the proximity of the locations. As the Maidens SAC (142 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.422 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.6.4.423 It is concluded that no adverse effects on the qualifying Annex II marine mammal features which could undermine the conservation objectives of The Maidens SAC will

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occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.55) is discussed in Table 1.116. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.116: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the physical features used by grey seal within the site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will prevent physical features used by grey seal within the site from being maintained or enhanced.</p>

1.6.4.424 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.4.425 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on bottlenose dolphin features of the Cardigan Bay/Bae Ceredigion SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Llwyn Peninsula and the Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.415 to 1.6.4.420, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (188.1 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Pen Llŷn a'r Sarnau/Llwyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.426 Therefore, the potential impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

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Grey seal

1.6.4.427 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.4.448.

Conclusions

1.6.4.428 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin features which could undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.61 to 1.6.2.65) is discussed in Table 1.117. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.117: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not reduce nor likely reduce for the foreseeable future the natural range of the population of bottlenose dolphin.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of bottlenose dolphin.</p>

1.6.4.429 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

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Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

- 1.6.4.430 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Pembrokeshire Marine/Sir Benfro Forol SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.415 to 1.6.4.420, due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (237.3 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.
- 1.6.4.431 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

- 1.6.4.432 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.71 to 1.6.2.74) is discussed in Table 1.118. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.118: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>Important elements are population size, structure, production, and condition of the species within the site</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not reduce nor likely reduce for the foreseeable future the natural range of the population of grey seal.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other</p>

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Conservation Objective	Conclusion
	(non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.6.4.433 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.4.434 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on harbour porpoise features of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area) outlined in paragraphs 1.6.4.399 to 1.6.4.402. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (300.5 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.435 Therefore, the potential impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.6.4.436 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.79 to 1.6.2.80) is discussed in Table 1.119. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.119: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species.</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not significantly disturb harbour porpoise.</p>
<p>The condition of supporting habitats and processes, and the availability of prey is maintained.</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the condition of the habitats and their processes and the availability of prey from being maintained.</p>

1.6.4.437 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Lundy SAC

Grey seal

1.6.4.438 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Lundy SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.415 to 1.6.4.420, due to the proximity of locations. As the Lundy SAC (335.1 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.439 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.6.4.440 It is concluded that no adverse effects on the qualifying Annex II grey seal features which could undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling)

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sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.85 to 1.6.2.87) is discussed in Table 1.120. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.120: Conclusions against the conservation objectives of the Lundy SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population and distribution of grey seal within the site from being maintained or restored.</p>

1.6.4.441 Therefore, it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Isles of Scilly Complex SAC

Grey seal

1.6.4.442 Impacts from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on grey seal features of the Isles of Scilly Complex SAC are predicted to be similar to those associated with the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (119.7 km from Morgan Array Area) outlined in paragraphs 1.6.4.415 to 1.6.4.420, due to the proximity of locations. As the Isles of Scilly Complex SAC (464.9 km from Morgan Array Area) is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.6.4.443 Therefore, the potential impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.6.4.444 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will

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occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during operations and maintenance. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.92 to 1.6.2.94) is discussed in Table 1.121. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.121: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Conclusion
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal or the supporting processes on which the habitats of grey seal rely from being maintained or restored.</p>
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets will not prevent the population and distribution of grey seal within the site from being maintained or restored.</p>

1.6.4.445 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities from the Morgan Generation Assets alone.

Sites assessed in line with the iterative approach

1.6.4.446 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.4.399 to 1.6.4.445 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.4.447 to 1.6.4.469.

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West Wales Marine/Gorllewin Cymru Forol SAC

- 1.6.4.447 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

- 1.6.4.448 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.4.415 to 1.6.4.420), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Rockabill to Dalkey Island SAC

- 1.6.4.449 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Saltee Islands SAC

- 1.6.4.450 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.4.415 to 1.6.4.420), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Roaringwater Bay and Islands SAC

- 1.6.4.451 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

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Blasket Islands SAC

- 1.6.4.452 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

- 1.6.4.453 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Abers - Côte des legends SCI

- 1.6.4.454 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Abers - Côte des legends SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Ouessant-Molène SCI

- 1.6.4.455 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Côte de Granit rose-Sept-Iles SCI

- 1.6.4.456 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Anse de Goulven, dunes de Keremma SCI

- 1.6.4.457 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

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SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Tregor Goëlo SCI

1.6.4.458 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Côtes de Crozon SCI

1.6.4.459 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Chaussée de Sein SCI

1.6.4.460 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Cap Sizun SCI

1.6.4.461 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Récifs du talus du golfe de Gascogne SCI

1.6.4.462 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel

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use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Anse de Vauville SCI

1.6.4.463 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Cap d'Erquy-Cap Fréhel SCI

1.6.4.464 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Baie de Saint-Brieuc – Est SCI

1.6.4.465 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Banc et récifs de Surtainville SCI

1.6.4.466 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.4.467 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

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Estuaire de la Rance SCI

- 1.6.4.468 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Baie du Mont Saint-Michel SCI

- 1.6.4.469 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.4.399 to 1.6.4.406), it can be concluded that beyond reasonable scientific doubt there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets alone.

Changes in fish and shellfish communities affecting prey availability

- 1.6.4.470 There is the potential for changes in marine mammal prey (e.g. fish species) abundance and distribution to arise as a result of construction and decommissioning activities which physically disturb the seabed, result in increased SSC or which generate underwater sound. Potential impacts to prey species may result in changes in the ability/success of marine mammals to forage in the area of the Morgan Generation Assets. The risk of effects on prey species is expected to be greatest during the construction phase (e.g. due to seabed disturbance and/or underwater sound during construction).
- 1.6.4.471 The HRA Stage 1 Screening Report (Document Reference E1.4) concluded that any potential temporary changes to the fish community in the vicinity of the Morgan Array Area as a result of construction and decommissioning potential impacts such as underwater sound, are unlikely to result in significant effects to Annex II marine mammal features given that the majority of potential impacts on prey species will be spatially limited to the Morgan Generation Assets (for habitat disturbance) and surrounding area (e.g. behavioural effects from underwater sound), particularly in the context of the foraging opportunities within the extensive ranges for marine mammal species and the highly mobile nature of these species. As such, no LSEs were anticipated to occur as a result of changes in prey availability to Annex II marine mammal features with the exception of the North Anglesey Marine/Gogledd Môn Forol SAC, which were screened in on a precautionary basis.
- 1.6.4.472 The potential for any adverse effects on prey were screened out for the operations and maintenance phase as effects are considered to be significantly reduced compared to the construction phase as underwater sound will be substantially lower (i.e. no piling will be required).
- 1.6.4.473 The MDS considered for the assessment of potential impacts on Annex marine mammal features from changes in prey availability is presented in Table 1.122.

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Table 1.122: Maximum design scenario considered for the assessment of potential impacts on marine mammals from changes in prey availability during the construction phase.

Phase	Maximum design scenario	Justification
Construction phase	<p>As described in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (F2.3) for:</p> <ul style="list-style-type: none"> • Temporary habitat loss/disturbance • Long term habitat loss • Increased SSC and associated sediment deposition • Disturbance/remobilisation of sediment-bound contaminants • Underwater sound during the construction phase impacting fish and shellfish receptors. 	<p>As described in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (F2.3).</p>

Measures adopted as part of the Morgan Generation Assets

1.6.4.474 The measures adopted as part of the Morgan Generation Assets that are relevant to effects from changes in prey availability are outlined in Table 1.123.

Table 1.123: Measures adopted as part of the project relevant to the assessment of adverse effect on European sites designated for Annex II marine mammal features from changes in prey availability.

Measure	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
<p>Development of, and adherence to, an Offshore EMP that will include a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.</p>	<p>To ensure that the potential for release of pollutants during construction, operations and maintenance, and decommissioning phases are minimised. These will likely include designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and tanks containing hazardous substances, and storage of these substances in impenetrable bunds. The MPCP will ensure that in the unlikely event that a pollution event occurs, that plans are in place to respond quickly and effectively to ensure any spillage is minimised and potential effects on the environment are ideally avoided or minimised.</p> <p>Implementation of these measures will ensure that accidental release of contaminants from vessels will be avoided or minimised, thus providing protection for marine life across all phases of Morgan Generation Assets.</p>	<p>A MPCP as part of the Offshore EMP is secured within the deemed marine licences of the draft DCO (Document Reference C1).</p>

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Measure	Justification	How the measure will be secured
<p>Development of, and adherence to, a Decommissioning Plan in accordance with the Energy Act 2004.</p> <p>A Decommissioning Programme is required under the provisions of the Energy Act 2004 and this must be approved by the Secretary of State before works commence.</p>	<p>The aim of this plan is to adhere to the existing UK legislation and guidance. Overall, this will ensure the legacy of the Morgan Generation Assets will result in the minimum amount of long-term disturbance to the environment.</p> <p>While this measure has been committed to as part of the Morgan Generation Assets, the MDS for the decommissioning phase has been considered in each of the impact assessments presented in section 1.6.4.</p>	<p>Legal obligation of the Energy Act 2004 and secured within the draft DCO (Document Reference C1).</p>

Construction phase

Information to support assessment

- 1.6.4.475 As outlined in the Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) the key prey species for Annex II marine mammals include small shoaling fish from demersal or pelagic habitats, particularly gadoids (e.g. cod *Gadus morhua*, haddock *Melanogrammus aeglefinus*, whiting *Merlangius merlangus*), whiting *Trisopterus spp*, clupeids (herring), European sprat *Sprattus sprattus*, sandeels, mackerel (*Scomber scombrus*), flatfish (plaice *Pleuronectes platessa*, sole, flounder, dab) and cephalopods.
- 1.6.4.476 Marine mammals exploit a range of different prey items and can forage widely and change prey sources, sometimes covering extensive distances. Given that the impacts of construction to prey resources will be localised and largely restricted to the boundaries of the Morgan Generation Assets, only a small area will be affected when compared to available foraging habitat in the Irish and Celtic Seas. The fish and shellfish communities found within the Morgan Fish and shellfish ecology study area are characteristic of the fish and shellfish assemblages in the wider Irish Sea and it is therefore reasonable to assume that, due to the highly mobile nature of marine mammals, there will be similar prey resources available in the wider area. There may be an energetic cost associated with increased travelling and two species, harbour porpoise and harbour seal, may be particularly vulnerable to this effect. Harbour porpoise has a high metabolic rate and only a limited energy storage capacity, which limits their ability to buffer against diminished food (Rojano-Doñate *et al.*, 2018). Conversely, harbour seal typically forage close to haul out sites, i.e. within nearest 50 km. Despite this, if animals do have to travel further to alternative foraging grounds, the impacts are expected to be short term in nature and reversible. It is expected that all marine mammal receptors would be resilient to the effect without any impact on reproduction and survival rates and would be able to return to previous activities once the impact had ceased.
- 1.6.4.477 Potential impacts on the marine mammal prey species outlined above during the construction and decommissioning phase have been assessed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) using the appropriate MDSs for these receptors. Impacts which may have indirect effects on marine mammals include temporary and long-term habitat loss/disturbance, underwater sound impacting fish and shellfish receptors, increased

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SSCs and associated sediment deposition, EMFs from subsea electrical cabling, colonisation of hard structures, and disturbance/remobilisation of sediment-bound contaminants.

- 1.6.4.478 The installation and removal of infrastructure within the Morgan Generation Assets may lead to temporary subtidal habitat loss/disturbance. There is the potential for temporary and habitat loss/disturbance to affect up to 61,422,400 m² of seabed during the construction phase, which equates to approximately 6.43% of the area within the Morgan Array Area overall, although only a small proportion of this will be impacted at any one time. For long term habitat loss, up to 760,452 m² may be lost (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement).
- 1.6.4.479 Habitat loss/disturbance could potentially affect spawning, nursery or feeding grounds of fish and shellfish receptors, which will impact those feeding higher up the food chain. However, as suggested in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement, only a small proportion of the maximum footprint of habitat loss/disturbance may be affected at any one time during the construction phase and areas will start to recover immediately after cessation of construction activities in the vicinity. Additionally, habitat disturbance during the construction phase will also expose benthic infaunal species from the sediment, potentially offering foraging opportunities to some fish and shellfish species (e.g. opportunistic scavenging species) immediately after completion of works.
- 1.6.4.480 With respect to underwater sound, marine mammals occurring within the predicted impact areas for fish and shellfish also have the potential to be directly affected as a result of impacts such as injury and disturbance from elevated underwater sound during piling and it is likely that the effects to prey resources (e.g. behavioural displacement) will occur over a similar, or lesser, extent and duration as those for marine mammals. There would, therefore, be no additional displacement of marine mammals as a result of any changes in prey resources during construction, as they would already be potentially disturbed as a result of underwater sound during piling. In addition, as prey resources are displaced from the areas of potential impact, marine mammals are likely to follow in order to exploit these resources.
- 1.6.4.481 There is also the potential for underwater sound during construction pile-driving to result in injury and/or disturbance to fish and shellfish communities. However, for auditory injury for most fish, the impact was predicted to be of regional spatial extent, medium term duration, intermittent and high reversibility, and is unlikely to lead to significant mortality due to primary mitigation.
- 1.6.4.482 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement determined the impact of underwater sound on most fish and shellfish receptors during the construction phase to predicted to be of regional spatial extent, relatively short-term duration, intermittent and of high reversibility, with the soundscape returning to near-baseline conditions upon completion of construction activities, with a magnitude of low for most species. However, due to the proximity of the Morgan Generation Assets to the nearby herring spawning grounds and given piling could take place during the herring spawning period (September to October), this impact for EIA was conservatively assessed as a moderate adverse significant effect for herring as a result of underwater sound.
- 1.6.4.483 As discussed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), whilst certain prey species may comprise the main part of their diet, all marine mammals in this assessment are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species. With most prey species having no significant adverse effect (see Volume 2, Chapter 3: Fish

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and shellfish ecology of the Environmental Statement) and the wide-ranging nature of marine mammals who can exploit numerous food sources, there would be a variety of prey species available for marine mammal foraging. Furthermore, the UWSMS with an Outline UWSMS submitted as part of the application (Document Reference J13), will present a review of relevant mitigation options in order to reduce the magnitude of impacts leading to significant effects (for the project alone) on fish and shellfish (such as herring spawning) to a non-significant effect, which would benefit marine mammal predators who may feed on these fish.

- 1.6.4.484 Other potential impacts included increased SSCs and associated sediment deposition which may result in short-term avoidance of affected areas by fish and shellfish receptors. Adult fish have high mobility and may show avoidance behaviour in areas of high sedimentation (Ecological Marine Unit, 2004), however, there may be impacts on the hatching success of fish and shellfish larvae and consequential effects on the viability of spawning stocks due to limited mobility (Bisson and Bilby, 1982; Berli *et al.*, 2014). However, most fish juveniles expected to occur in the Morgan Fish and Shellfish Ecology study area will be largely unaffected by the relatively low-level temporary increases in SSC and impacts will be short in duration, returning to background levels relatively quickly and the effect is predicted to be minor which will not impact marine mammals.
- 1.6.4.485 A moderate adverse effect, which is significant in EIA terms, was predicted for herring as a result of underwater sound during the construction phase of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). No other significant adverse effects were predicted to occur to fish and shellfish species (marine mammal prey) as a result of the construction of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). Therefore, changes in fish and shellfish communities affecting prey availability for marine mammals were predicted to be of local spatial extent, medium-term duration, intermittent and high reversibility.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

- 1.6.4.486 The impacts of construction and decommissioning will be highly localised and largely restricted to the boundaries of the Morgan Generation Assets, only a small area will be affected when compared to available foraging habitat in the Irish Sea. Harbour porpoise feed on a variety of prey including gobies, sandeel, whiting, herring and sprat (Santos and Pierce, 2003; Aarfjord, 1995). There may be an energetic cost associated with increased travelling and due to harbour porpoise high metabolic rate (see paragraph 1.6.4.476), this species may be particularly vulnerable to this effect. However, harbour porpoises have a widespread distribution and individuals have been documented either switching to different prey species depending on the prey availability (Santos and Pierce, 2003) or moving relatively large distances on a daily basis (Nielsen *et al.*, 2013). Based on findings of Benhemma-Le Gall *et al.* (2021), it can be anticipated that harbour porpoise can compensate for any resulting loss in energy intake by increasing foraging activities beyond impact zone. The availability of wider suitable habitat across the CIS MU suggest that individuals may move to alternative foraging grounds without affecting animals' health.
- 1.6.4.487 As outlined in paragraph 1.6.4.315, no significant adverse effects were predicted to occur to most fish and shellfish species (marine mammal prey) as a result of the construction of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and

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shellfish ecology of the Environmental Statement (Document Reference F2.3). However, there may be an adverse significant effect on herring (spawning grounds) but as stated in paragraph 1.6.4.483, harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species.

1.6.4.488 Therefore, the potential impact is not predicted to result in adverse effects (i.e. disruption to foraging) for harbour porpoise.

Conclusions

1.6.4.489 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of changes in fish and shellfish communities. An assessment of the potential impact against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.124. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.124: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for changes in prey availability during the construction phase.

Conservation Objective	Conclusion
<p>Harbour porpoise is a viable component of the site.</p> <p>There is no significant disturbance of the species.</p>	<p>Harbour porpoise may be affected in response to changes in fish and shellfish communities affecting prey availability in the vicinity of the Morgan Generation Assets boundaries, however, impacts to prey species are predicted to be localised, short term and intermittent, and harbour porpoise are expected to adapt (they are considered to be opportunistic feeders and are thus not reliant on a single prey species) and recover quickly. As such there is a negligible risk of disruption of foraging activities of harbour porpoise. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets will not significantly disturb the species.</p>
<p>The condition of supporting habitats and processes, and the availability of prey is maintained.</p>	<p>There is no pathway for changes in fish and shellfish communities affecting prey availability to result in adverse effects on the habitats of the qualifying species and there are no adverse effects expected for fish and shellfish species. No significant adverse effects were predicted to occur to most fish and shellfish species (marine mammal prey) as a result of the construction of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.4) but there may be an adverse significant effect on herring (spawning grounds). However, this adverse significant effect is only concluded during the spawning periods for herring and harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets will not prevent the condition of habitats and their processes and the availability of prey from being maintained.</p>

1.6.4.490 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of changes in prey availability from the Morgan Generation Assets alone.

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1.6.5 Assessment of adverse effects in-combination

- 1.6.5.1 The other developments (projects/plans) that could result in in-combination effects associated with the Morgan Generation Assets on Annex II marine mammal features of the designated sites identified have been summarised in Table 1.125 and shown in Figure 1.12.
- 1.6.5.2 As outlined in the HRA Stage 1 Screening Report (Document Reference E1.4), where the potential for LSE has been concluded with respect to the Morgan Generation Assets alone, the potential for LSE has also been concluded in-combination. For impacts where LSE has been ruled out with respect to the Morgan Generation Assets alone, there is either no pathway to effect, or the Morgan Generation Assets would result in only negligible or inconsequential effects that would not contribute (even collectively) or materially to in-combination effects and therefore, no additional in-combination issues are identified.
- 1.6.5.3 On this basis, the potential impacts identified for assessment as part of the Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), and which have been brought forward for consideration in the in-combination assessment of the HRA Stage 2 ISAA Part 2 – SAC assessments are:
- In-combination injury and disturbance from elevated underwater sound during piling
 - In-combination injury and disturbance from elevated underwater sound during UXO clearance
 - In-combination injury and disturbance from elevated underwater sound during pre-construction site investigation surveys
 - In-combination injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities
 - In-combination changes in fish and shellfish communities affecting prey availability.
- 1.6.5.4 The following assessments of the effects of the Morgan Generation Assets acting in-combination with other relevant plans and projects, on Annex II marine mammals have been informed by the detailed project-specific underwater sound modelling presented in Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document Reference F3.3.1) and the technical assessments presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). The Applicant has also made all reasonable efforts to ensure that the information included in the assessment relating to other projects is correct and sufficiently detailed, with any limitations on the information available acknowledged. The assessments have also drawn upon the sensitivity assessments of the relevant marine mammals detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on whether an Adverse Effect on Integrity on a European site(s) and qualifying features can or cannot be ruled out as a result of the Morgan Generation Assets in-combination with other plans and projects have been identified in light of the best scientific knowledge in the field and all reasonable scientific doubt can be ruled out.

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- 1.6.5.5 A full assessment of adverse effects on site integrity for the Morgan Generation Assets in-combination with other projects/plans has been undertaken for all the sites listed in Table 1.50 (see paragraph 1.6.1.9). In addition, as outlined in paragraph 1.6.1.10, an iterative approach to the assessment has been followed for the remaining European sites located exclusively in Welsh, Irish or French waters. The assessment for these additional sites is presented for each potential impact following the full assessments for the sites listed in Table 1.50.

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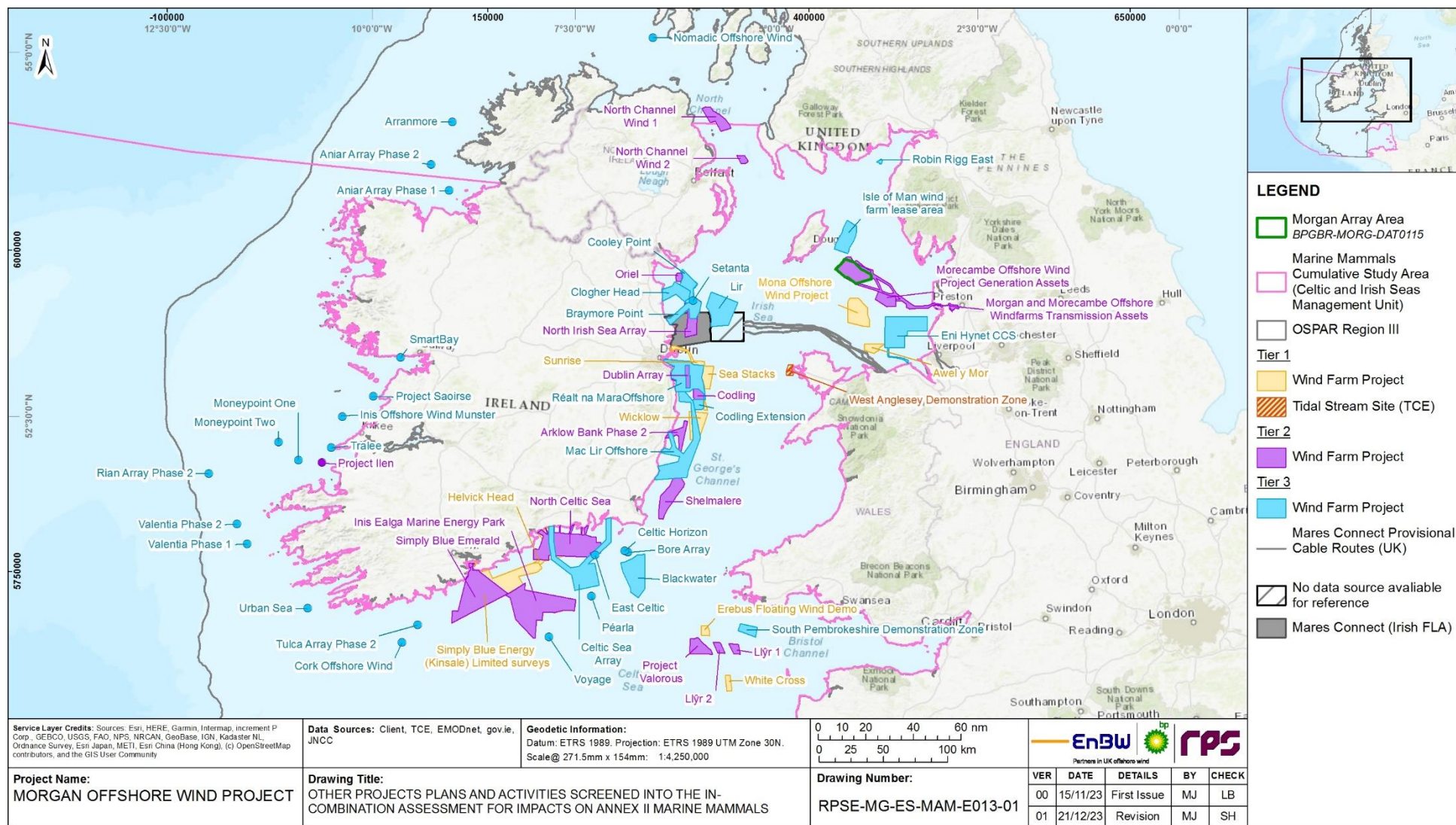


Figure 1.12: Location of other projects and plans considered for in-combination effects on SACs with Annex II marine mammal features

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Table 1.125: List of other projects and plans with potential for in-combination effects on Annex II marine mammal features.

*These offshore wind projects are only included in the grey seal extended screening area (OSPAR region III) and lie outside of the CIS MU screening area.

Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
Tier 1						
Mona Offshore Wind Project	Pre-application	11.1	Offshore Wind Farm	2026 to 2029	2030 to 2065	Construction and operational activities for the Morgan Generation Assets may overlap with construction and operational activities of Mona Offshore Wind Project.
Awel y Môr Offshore Wind Farm	Consented	46.8	Offshore Wind Farm	2026 to 2029	2030 to 2055	Construction and operational activities for the Morgan Generation Assets may overlap with construction and operational activities of Awel y Môr Offshore Wind Farm.
West Anglesey Demonstration Zone tidal site	Permitted but not yet implemented	79.3	Tidal Demonstration Zone	2021 to 2023	2024 to 2061	Operational activities for the Morgan Generation Assets may overlap with operational activities of West Anglesey Tidal Demonstration Zone.
Mainstream, Renewable Power Ltd-Site Investigations	Submitted but not yet determined	104.2	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						activities for Mainstream Dublin Northeast Wind.
Statkraft North Irish Sea Array (NISA) Site Investigations	Operational	107.6	Offshore Wind Farm: site investigations	n/a	2021 to 2026	Construction activities for the Morgan Generation Assets may overlap with site investigation activities for the Statkraft NISA.
Site Investigations for the proposed Sunrise Offshore Wind Farm	Submitted but not yet determined	124.7	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for Sunrise Offshore Wind Farm.
ESB Wind Development Limited Site Investigations at Sea Stacks Offshore Wind	Submitted but not yet determined	127.4	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for ESB Sea Stacks Offshore Wind.
Site Investigations for proposed Offshore Wind Farm	Submitted but not yet determined	133.1	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for Banba Offshore Wind Farm.
RWE Renewables Ireland Site Investigations for Dublin Array Offshore Wind Farm	Submitted but not yet determined	134.4	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						site investigation activities for RWE Renewables Dublin Array Offshore Wind Farm.
Site Investigations for the proposed Wicklow Project offshore wind farm	Submitted but not yet determined	149.7	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for Wicklow Project Offshore Wind Farm.
Shelmalere Offshore Wind Farm - Site Investigations	Submitted but not yet determined	182.8	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for Shelmalere Offshore Wind Farm.
Project Erebus	Under Construction	237.5	Floating Demonstration Projects	2024 to 2026	2026 to 2051	Construction activities for the Morgan Generation Assets may overlap with operational activities of Project Erebus.
SSE Renewables Celtic Sea surveys	Submitted but not yet determined	260.8	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for SSE Renewables Celtic Sea Offshore Wind Farm.

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
ESB Wind Development Limited Site Investigations off Waterford and Cork Coasts - Helvick Head Offshore Wind	Submitted but not yet determined	289.2	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for ESB Helvick Head Offshore Wind .
White Cross Offshore Wind Farm	Submitted but not yet determined	319.6	Test and Demonstration Floating Wind Farm	2025 to 2027	2027 to unknown	Construction and operational activities for the Morgan Generation Assets may overlap with construction and operational activities of White Cross.
ESB Celtic Offshore Wind - Site Investigations	Submitted but not yet determined	325.3	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for ESB Celtic Offshore Wind.
Simply Blue Energy (Kinsale) Limited surveys	Submitted but not yet determined	359.2	Floating Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with site investigation activities for Simply Blue Energy (Kinsale) Limited surveys.
Site Investigations for the proposed Kinsale Project offshore wind farm	Submitted but not yet determined	383.0	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities for the Morgan Generation Assets to overlap with

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						site investigation activities for Kinsale Project Offshore Wind Farm.
Twin Hub	Permitted but not yet implemented	407.7	Floating offshore wind platforms (32 MW)	2024 to 2026	2026 to unknown	Construction and operational activities at Morgan Generation Assets may overlap with operational activities of Twin Hub.
Tier 2						
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	Pre-application	0.0	Transmission Assets	2026 to 2029	2030 to 2065	Construction and operational activities for the Morgan Generation Assets may overlap with construction and operational activities of the Morgan and Morecambe Offshore Windfarms: Transmission Assets.
Moor Vannin Offshore Wind Farm	Pre-application	4.8	Offshore wind farm	2030 to 2032	Unknown	There is potential operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Moor Vannin Offshore Wind Farm
Morecambe Generation Assets	Pre-application	11.2	Offshore Wind Farm	2026 to 2029	2030 to 2089	Construction and operational activities at the Morgan Generation

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						Assets may overlap with construction and operational activities at Morecambe Generation Assets.
North Channel Wind 2	Pre-application	106.5	Floating Offshore Wind Farm	2027 to 2030	Unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with construction and operational activities at North Channel Wind 2.
North Irish Sea Array Offshore Wind Farm	Pre-application	107.6	Offshore Wind Farm	2025 to 2027	2027 to 2059	Construction and operational activities at the Morgan Generation Assets may overlap with construction and operational activities at North Irish Sea Array Offshore Wind Farm.
Oriel Offshore Wind Farm	Pre-application	119.4	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Oriel Offshore Wind Farm
Dublin Array Offshore Wind Farm	Pre-application	134.4	Offshore Wind Farm	2026 to 2028	2029 to 2062	Construction and operational activities at the Morgan Generation

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						Assets may overlap with construction and operational activities at Dublin Array.
North Channel Wind 1	Pre-application	134.5	Floating Offshore Wind Farm	2027 to 2030	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at North Channel Wind 1.
Codling Wind Park Offshore Wind Farm	Pre-application	141.2	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Codling Wind Park Offshore Wind Farm
Arklow Bank Wind Park Phase 2	Pre-application	165.3	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Arklow Bank Wind Park Phase 2
Project Valorous	Pre-application	170.5	Early commercial Floating	2028 to 2029	2029 to 2054	Construction and operational activities for the Morgan Generation

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
			Offshore Wind Farm			Assets may overlap with construction and operational activities of Project Valorous.
Shelmalere Offshore Wind Farm	Pre-application	201.4	Offshore Wind Farm	2028 to 2029	2030 to 2055	Construction and operational activities for the Morgan Generation Assets may overlap with construction and operational activities of Shelmalere Offshore Wind Farm.
North Celtic Sea Offshore Wind Farm	Pre-application	277.0	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at North Celtic Sea Offshore Wind Farm
Llŷr 2	Pre-application	295.0	Floating Demonstration Project	2025 to 2026	2026 to 2051	Construction and operational activities at the Morgan Generation Assets may overlap with operational activities at Llŷr 2.
Llŷr 1	Pre-application	298.5	Floating Demonstration Project	2025 to 2026	2026 to 2051	Construction and operational activities at the Morgan Generation Assets may overlap with operational activities at Llŷr 1.

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
Inis Ealga Marine Energy Park	Pre-application	327.0	Floating Offshore Wind Farm	2028 to 2030	2030 to unknown	Construction and operational activities at the Morgan Generation Assets may overlap with construction and operational activities at Inis Ealga Marine Energy Park.
Simply Blue Emerald	Pre-application	359.2	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Simply Blue Emerald.
Project Ilen	Pre-application	393.7	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Project Ilen.
*Spiorad na Mara – Offshore Wind Project	Pre-application	530.3	Offshore wind farm	2028 to unknown	2030 to unknown	There is potential for construction and operational activities for the Morgan Generation Assets to overlap with construction and operational activities for Spiorad na Mara – Offshore Wind Project.

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
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Tier 3

Eni Hynet CCS	Pre-application	31.0	Carbon Capture and Storage project in Liverpool Bay	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Eni Hynet CCS.
MaresConnect	Pre-application	48.2	Subsea and underground electricity interconnector cable between Republic of Ireland and North Wales	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at MaresConnect.
Lir Offshore Array*	Pre-application	80.5	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Lir Offshore Array.
Braymore Point	Pre-application	107.6	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						operational activities at Braymore Point.
Cooley Point Offshore Wind Farm	Pre-application	108.1	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Cooley Point Offshore Wind Farm.
Setanta Offshore Wind Park*	Pre-application	113.6	Offshore wind farm	2027 to 2029	2030 to unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Setanta Offshore Wind Park.
Clogher Head Offshore Wind Farm	Pre-application	114.3	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Clogher Head Offshore Wind Farm.
Realt na Mara*	Pre-application	127.1	Offshore wind farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						Assets to overlap with construction and operational activities at Realt na Mara.
Codling Wind Park Extension Offshore Wind Farm	Pre-application	141.2	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Codling Wind Park Extension Offshore Wind Farm.
Mac Lir*	Pre-application	143.9	Offshore wind farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Mac Lir.
Malin Sea Wind*	Pre-application	225.8	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Malin Sea Wind.
Nomadic Offshore Wind*	Pre-application	227.3	Floating Offshore Wind Farm	Unknown	2030 to unknown	There is potential for construction and operational activities for

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						the Morgan Generation Assets to overlap with construction and operational activities at Nomadic Offshore Wind.
Haven Offshore Array Wind Farm*	Pre-application	248.0	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Haven Offshore Array Wind Farm.
Machair Wind – Hybrid Energy Project*	Pre-application	255.0	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Machair Wind – Hybrid Energy Project.
Celtic Sea Array Offshore Wind Farm	Submitted but not yet determined	260.8	Offshore Wind Farm (1.2GW Capacity)	2027 to 2029	2030 to unknown	Construction and operational activities at the Morgan Generation Assets may overlap with construction and operational activities at Celtic Sea Array Offshore Wind Farm.
Blackwater Offshore Wind Farm	Pre-application	266.0	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Blackwater Offshore Wind Farm.
Bore Array*	Pre-application	272.9	Offshore wind farm	2027 to 2029	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Bore Array.
Celtic Horizon*	Pre-application	273.6	Offshore wind farm	2027 to 2029	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Celtic Horizon.
South Pembrokeshire Demonstration Zone	Submitted but not yet determined	278.2	Wave energy demonstration project	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at South Pembrokeshire Demonstration Zone.

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
East Celtic*	Pre-application	290.7	Offshore wind farm	Unknown	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with construction and operational activities at East Celtic.
Aniar Offshore Array (Fixed)*	Pre-application	307.3	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Aniar Offshore Array (Fixed).
Celtic Sea RWE Renewables	Pre-application	312.7	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Celtic Sea RWE Renewables.
Péarla Offshore Wind Farm*	Pre-application	317.5	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						Péarla Offshore Wind Farm.
Arranmore*	Pre-application	319.8	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Arranmore.
Aniar Offshore Array (Floating) *	Pre-application	325.4	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Aniar Offshore Array (Floating).
Voyage Offshore Array*	Pre-application	362.9	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Voyage Offshore Array.
Inis Offshore Wind Munster	Pre-application	383.0	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or

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Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						operational activities at Inis Offshore Wind Munster.
Project Saoirse	Pre-application	396.0	Wave energy demonstration project	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Project Saoirse.
Tralee*	Pre-application	416.5	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Tralee.
Tulca Offshore Array Phase 2*	Pre-application	427.2	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Tulca Offshore Array Phase 2.
Cork Offshore Wind Project	Pre-application	445.4	Offshore Wind Farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						construction and operational activities at Cork Offshore Wind project.
Moneypoint Offshore One*	Pre-application	443.9	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Moneypoint Offshore One.
Urban Sea*	Pre-application	488.4	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Urban Sea.
Valentia Phase 1*	Pre-application	505.8	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Valentia Phase 1.
Valentia Phase 2*	Pre-application	506.8	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Project/Plan name	Status	Distance from the Morgan Array Area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets
						Assets to overlap with construction and/or operational activities at Valentia Phase 2.
Rian Offshore Array Phase 2*	Pre-application	513.4	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Morgan Generation Assets to overlap with construction and/or operational activities at Rian Offshore Array Phase 2.
Talisk*	Pre-application	528.8	Floating Offshore Wind Farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Morgan Generation Assets to overlap with construction and operational activities at Talisk.

In-combination injury and disturbance from elevated underwater sound during piling

- 1.6.5.6 There is potential for injury and/or disturbance from elevated underwater sound as a result of activities associated with the Morgan Generation Assets during construction, in-combination with activities associated with the projects/plans outlined in Figure 1.12 and Table 1.125.
- 1.6.5.7 As for the assessment of the Morgan Generation Assets alone, the risk of injury in terms of PTS to most of the marine mammal receptors, as a result of elevated underwater sound due to piling, would be expected to be localised to within the boundaries of the respective projects. It is also anticipated that standard offshore wind industry construction methods (which include soft starts and visual and acoustic monitoring of marine mammals as standard) will be applied for all projects, thereby reducing the magnitude of the potential impact with respect to auditory injury occurring in marine mammals. The Morgan Generation Assets is developing an Outline UWSMS (Document Reference J13) which will set out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude of the project alone. Although it cannot be assumed that other projects and plans will implement sound reduction/NAS measures, there is still a very low potential for significant in-combination effects for injury from elevated underwater sound during piling and the in-combination assessment presented below therefore focuses on disturbance only.
- 1.6.5.8 The in-combination effects assessment has followed the methodology set out in Volume 1, Chapter 5: EIA methodology of the Environmental Statement. The assessment considered the impact of disturbance from elevated underwater sound during piling under the following in-combination scenarios (see section 1.4.5, paragraphs 1.4.5.5 to 1.4.5.9):
- Scenario 1: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets
 - Scenario 2: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets and the Morecambe Offshore Windfarm Generation Assets
 - Scenario 3: Morgan Generation Assets plus Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside all other projects, plans and activities. This assessment has been allocated into ‘tiers’ reflecting the current stage of the other projects, plans and activities within the planning and development process. This tiered approach is adopted to provide a clear assessment of the Morgan Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, alongside other projects, plans and activities.
- 1.6.5.9 Piling parameters for the Morgan Generation Assets; the Transmission Assets; Morecambe Offshore Windfarm: Generation Assets; and Tier 1 projects (Mona Offshore Wind Project, Awel y Môr Offshore Wind Farm, Project Erebus and White Cross Offshore Windfarm) are set out in Table 1.126. Table 1.127 sets out the numbers of animals predicted to be disturbed as a result of elevated underwater sound during piling for these projects.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.126: Piling parameters for Tier 1 projects and Tier 2 projects Morgan and Morecambe Offshore Windfarms Transmission Assets, Morecambe Offshore Windfarm: Generation Assets.

^a This table includes one OSP which is considered under both the Morgan Generation Assets and the Morgan and Morecambe Offshore Windfarms Transmission Assets; and one OSP which is considered under both the Morgan and Morecambe Offshore Windfarms Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets. This assessment therefore double counts the OSPs and is precautionary.

Project	Reference	Maximum number of piles	Scenario	Piling duration	Piling phase
Morgan Generation Assets	Section 1.6.4	454	<u>Maximum spatial scenario</u> Pin pile 3,000 kJ / 3,000 kJ Concurrent piling	90 days	24 months
		454	<u>Maximum temporal scenario</u> Pin pile 4,400 kJ / 3,000 kJ Single piling	114 days	
Tier 1					
Mona Offshore Wind Project	Mona Offshore Wind Ltd. (2023)	454	Pin pile 3,300 kJ Concurrent piling	90 days	24 months
Awel y Môr Offshore Wind Farm	RWE (2022b)	50	Monopile 5,000 kJ Sequential piling	201 days	12 months
Project Erebus	Blue Gem Wind (2020)	35	Pile 800 kJ	18 days	8 months
White Cross Offshore Windfarm	White Cross Offshore Wind (2023)	48	WTG: pin pile 800 kJ Single piling	5 days	6 months
		4	OSP: pin pile 2,500 kJ Single piling	1 day	
Tier 2					
Morecambe Offshore Windfarm: Generation Assets	Morecambe Offshore Windfarm Ltd (2023)	42	Monopile 5,000 kJ Single piling	42 days	24 months

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Project	Reference	Maximum number of piles	Scenario	Piling duration	Piling phase
Morgan and Morecambe Offshore Windfarms Transmission Assets	Morgan Offshore Wind Ltd. and Morecambe Offshore Windfarm Ltd. (2023)	4	Monopile 5,500 kJ / 5,000 kJ Concurrent piling	4 days	15 months

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.127: Cumulative assessment – numbers of animals predicted to be disturbed as a result of elevated underwater sound during piling for Tier 1 projects and Tier 2 Projects Morgan and Morecambe Offshore Windfarms Transmission Assets and Morecambe Offshore Windfarm: Generation Assets.

^a Based on realistic density of 0.13 animals/km² (JCP Phase III Tool estimate)

^b OSPAR Region III was applied as a broader population reference for all projects other than Morecambe Offshore Windfarm: Generation Assets. For Morecambe Offshore Windfarm: Generation Assets a combined MU of: SCOS MUs, Isle of Man population estimate, east Ireland and south east Ireland populations was applied.

^c White Cross Offshore Windfarm: number based on TTS as a proxy for disturbance (White Cross Offshore Wind (2023)).

^d White Cross Offshore Windfarm: number based on activation of an ADD for 31 minutes (White Cross Offshore Wind (2023)).

^e White Cross Offshore Windfarm: number based on activation of an ADD for 62 minutes (White Cross Offshore Wind (2023)).

^f White Cross Offshore Windfarm: number based on a 25 km known disturbance range for grey seal for piling (White Cross Offshore Wind (2023)).

Project	Harbour porpoise		Bottlenose dolphin		Grey seal		Harbour seal	
	Density (animals per km ²)	Max no animals disturbed (% CIS MU)	Density (animals per km ²)	Max no animals disturbed (% IS MU)	Density (animals per km ²)	Max no animals disturbed (% GSRP / % OSPAR Region III) ^b	Density (animals per km ²)	Max no animals disturbed (% HSRP)
Morgan Generation Assets (maximum spatial scenario)	0.262	1,007 (1.61%)	0.0012	5 (1.57%)	N/A – grid cell specific	61 (0.47% / 0.10%)	N/A – grid cell specific	< 1 (0.01%)
Morgan Generation Assets (maximum temporal scenario)	0.262	858 (1.37%)	0.0012	4 (1.34%)		54 (0.41% / 0.09%)		< 1 (0.01%)

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Project	Harbour porpoise		Bottlenose dolphin		Grey seal		Harbour seal	
	Density (animals per km ²)	Max no animals disturbed (% CIS MU)	Density (animals per km ²)	Max no animals disturbed (% IS MU)	Density (animals per km ²)	Max no animals disturbed (% GSRP / % OSPAR Region III) ^b	Density (animals per km ²)	Max no animals disturbed (% HSRP)
Tier 1								
Mona Offshore Wind Project	0.2773	1,142 (1.83%)	0.0017	7 (2.39%)	N/A – grid cell specific	31 (0.23%) / (0.05%)	N/A – grid cell specific	< 1 (0.01%)
Awel y Môr Offshore Wind Farm	1.0 (0.13 animals per km ²) ^a	2,112 (275) ^a (3.38%)	0.035 for the 20m depth contour 0.008 offshore	23 (7.9%)	0.43	81 (1.6%/0.1%)	Project did not consider effects on harbour seal	
White Cross Offshore Windfarm (WTG)	0.918	1,652 ^c (2.6%)	Not considered under CEA for bottlenose dolphin, as project outside IS MU		0.005	10 ^f (0.48% - SW England MU)	Project did not consider effects on harbour seal	
White Cross Offshore Windfarm (OSP)	0.918	2,754 ^c (4.4%)			10 ^f (0.48% - SW England MU)			
Project Erebus	0.04	1,967 (3.15%)	Not considered under CEA for bottlenose dolphin, as project outside IS MU		N/A – Grid cell specific	18 (0.3%/0.0%)	Project did not consider effects on harbour seal	

Tier 2

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Project	Harbour porpoise		Bottlenose dolphin		Grey seal		Harbour seal	
	Density (animals per km ²)	Max no animals disturbed (% CIS MU)	Density (animals per km ²)	Max no animals disturbed (% IS MU)	Density (animals per km ²)	Max no animals disturbed (% GSRP / % OSPAR Region III) ^b	Density (animals per km ²)	Max no animals disturbed (% HSRP)
Morgan and Morecambe Offshore Windfarms Transmission Assets	0.560	2,465 (3.94%)	0.35	11 (3.7%)	N/A – Grid cell specific	88 (0.65%/0.14%)	N/A – Grid cell specific	<1 (0.01%)
Morecambe Offshore Windfarm: Generation Assets	1.394	1,279 (2.0%)	0.0005	<1 (0.000017%)	0.084	11 (0.99%/0.098%)	0.024	3 (0.19%)

Scenario 1: Morgan Generation Assets together with the Transmission Assets

- 1.6.5.10 The construction of the Morgan Generation Assets, together with the construction of the Transmission Assets may lead to disturbance to marine mammals during piling.
- 1.6.5.11 Given there is a potential for temporal overlap of piling phases at the two projects, animals could be disturbed during piling at both projects simultaneously. Therefore, where cumulative numbers of animals potentially disturbed are presented (e.g. paragraph 1.6.5.13 for harbour porpoise) the number of animals are summed from both projects. One OSP (therefore 12 pin piles) at the Morgan Generation Assets is considered under both the Morgan Generation Assets and the Transmission Assets applications and therefore the number of days of piling and number of animals to be disturbed on each day of piling is conservative. Cumulative iPCoD modelling was conducted to support the CEA, incorporating numbers of animals disturbed by each project (which similarly considers one OSP under both projects).

Construction phase

- 1.6.5.12 There is potential for a cumulative effect of piling at the Transmission Assets with piling at the Morgan Generation Assets. The maximum duration of piling at Morgan Generation Assets is 89.5 days over the piling phase between 2027 and 2028 (based on the maximum temporal scenario). For the Transmission Assets, for concurrent piling (5,500 kJ/5,000 kJ) there will be up to four days of piling over the piling phase of 12 months between 2027 and 2028, within the four-year construction phase (Morgan Offshore Wind Ltd. and Morecambe Offshore Windfarm Ltd, 2023). The potential for temporal overlap of piling activities between Morgan Generation Assets and Transmission Assets is considered likely.

Harbour porpoise

- 1.6.5.13 The number of animals potentially disturbed at the Transmission Assets and Morgan Generation Assets is presented in Table 1.127. As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the in-combination assessment at the Morgan Generation Assets and Transmission Assets has the potential to affect up to 3,472 harbour porpoise (5.5% of the CIS MU) (1,007 and 2,465, respectively).
- 1.6.5.14 As outlined in paragraph 1.6.4.133, the EDR approach has also been used for the assessment of disturbance associated with pile driving during the construction phase for harbour porpoise features in-combination with other plans and projects. As outlined in section 1.6.4 the use of a 15 km EDR rules out potential disturbance from in-combination effects to harbour porpoise features of all SACs screened into the ISAA. All SACs are located in excess of 15 km from the Morgan Generation Assets and therefore it can be concluded that the Morgan Generation Assets will not contribute to an in-combination effect on these SACs if using the EDR approach.
- 1.6.5.15 Figure 1.13 shows the 15 km EDR for the Morgan Generation Assets and 26 km EDR for Transmission Assets (as presented in the Transmission Assets PEIR). The Transmission Assets PEIR ruled out potential disturbance to harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC based on lack of overlap of the 26 km EDR for all SACs screened into the HRA Stage 2 ISAA.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

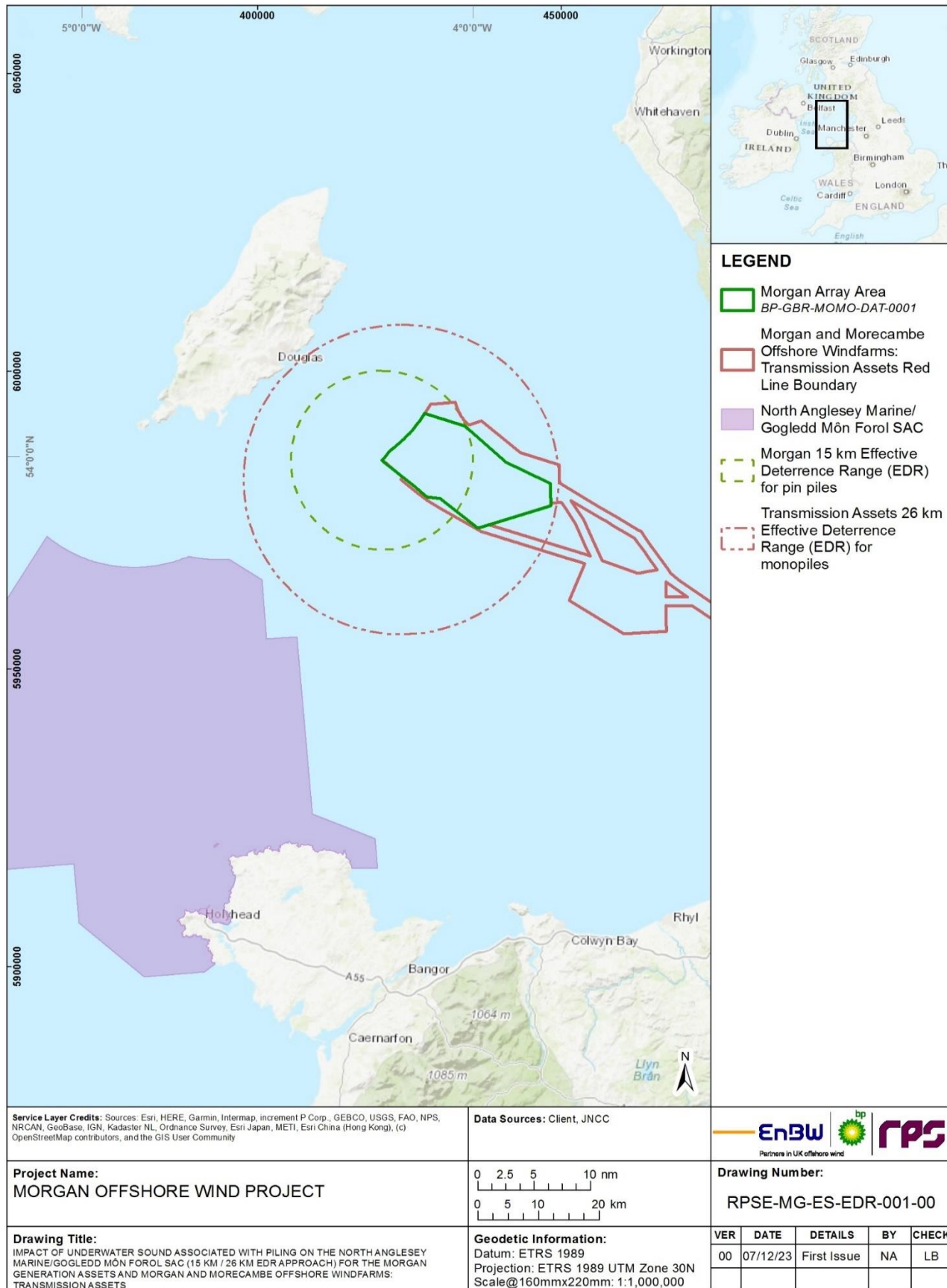


Figure 1.13: Maximum spatial overlap of elevated underwater sound impacts associated with piling at the Morgan Generation Assets and Morecambe Offshore Windfarms Transmission Assets on the North Anglesey Marine/Gogledd Môn Forol SAC, based on the EDR approach.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.16 As outlined in paragraph 1.6.4.40, in parallel with the EDR approach, the unweighted sound threshold value of 143 dB re 1 μ Pa²s SEL_{ss} (Tougaard *et al.*, 2021) as set out in NRW's 'Position on assessing behavioural disturbance of harbour porpoise from underwater noise' (NRW, 2023) has also been applied. This demonstrated an overlap of 0.002% of the total North Anglesey Marine/Gogledd Môn Forol SAC area for the west piling location (single piling of 4,400 kJ). In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 0.06 km², over 114 days of piling across the construction phase (see Table 1.127) would result in an average of 0.001% of the relevant area of the SAC being affected over the season). This therefore falls well within the threshold of 20% of the relevant area of the SAC in any given day and 10% of the relevant area of the site over the season. As this is the closest piling location, disturbance associated with all other piling locations within the Morgan Array Area would be reduced. However, the unweighted 143 dB re 1 μ Pa²s SEL_{ss} contour approach has not been applied to the assessment of disturbance for harbour porpoise features with Transmission Assets, as this would require the generation of project-specific unweighted 143 dB re 1 μ Pa²s SEL_{ss} contours for Transmission Assets, which are not publicly available. Furthermore, the Transmission Assets also ruled out any overlap of 143 dB re 1 μ Pa²s SEL_{ss} sound contours with the the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.17 As overlap of the SAC, applying the 26 km EDR approach, was ruled out in Transmission Assets, there is no increase in disturbance to the North Anglesey Marine/Gogledd Môn Forol SAC compared to the project alone (0.002% on any given day). This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

Bottlenose dolphin, grey seal, harbour seal

- 1.6.5.18 The consequences of potential simultaneous piling in 2027 and 2028, i.e. larger area of strong disturbance compared to the Morgan Generation Assets alone and longer duration of the effect, are described in more detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).
- 1.6.5.19 As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the in-combination assessment at the Morgan Generation Assets and Transmission Assets has the potential to affect up to 11 bottlenose dolphin (5 and 6, respectively), 142 grey seal (61 and 54, respectively) and 2 harbour seal (1 and 1, respectively). However, this is likely to be an overestimate, given the proximity of the sites and likelihood that sound contours will overlap.
- 1.6.5.20 Population modelling was carried out for Morgan Generation Assets and Transmission Assets for bottlenose dolphin and grey seal, as presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). This demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation), however, there may be a small reduction in population size for the impacted populations. As outlined above, it should be noted that this assessment is highly precautionary and does not take into account the measures adopted as part of the Morgan Generation Assets that are outlined in Table 1.56.

Scenario 2: Morgan Generation Assets together with the Morgan and Morecambe Offshore Wind Farms Transmission Assets Morecambe Offshore Wind Farms Transmission Assets

- 1.6.5.21 The construction of the Morgan Generation Assets, together with the construction of the Transmission Assets and the Morecambe Offshore Wind Farm: Generation Assets may lead to disturbance to marine mammals during piling.
- 1.6.5.22 As per the cumulative assessment of the Morgan Generation Assets and the Morgan and Morecambe Offshore Windfarms Transmission Assets (paragraph 1.6.5.11), given there is a potential for temporal overlap of piling phases at all three projects, animals could potentially be disturbed during piling simultaneously, and therefore the number of animals are summed from all three projects. One OSP at the Morgan Generation Assets is also considered under the Morgan and Morecambe Offshore Windfarms Transmission Assets and two OSPs at the Morecambe Offshore Wind Farm: Generation Assets are also considered under the Morgan and Morecambe Offshore Windfarms Transmission Assets therefore the number of days of piling and number of animals to be disturbed on each day of piling is highly conservative. Cumulative iPCoD modelling was conducted (see Volume 2 Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)) to support the In-combination assessment, incorporating numbers of animals disturbed by each project, which considers OSPs in line with this In-combination assessment.

Construction phase

- 1.6.5.23 There is potential for a cumulative effect of piling at the Morgan Generation Assets with piling at the Transmission Assets and Morecambe Offshore Windfarm: Generation Assets. For the Morecambe Offshore Windfarm: Generation Assets, for single piling (5,500 kJ) there will be up to 42 days of piling over the piling phase of 24 months between 2027 and 2028, within the 2.5 year construction phase (Morecambe Offshore Windfarm Ltd, 2023). Project information for Transmission Assets is set out in Table 1.126. The potential for temporal overlap of piling activities between Morgan Generation Assets, Transmission Assets and Morecambe Offshore Windfarm: Generation Assets is considered likely.

Harbour porpoise

- 1.6.5.24 The number of animals potentially disturbed at the Morgan Generation Assets, Transmission Assets and Morecambe Offshore Windfarm: Generation Assets is presented in Table 1.127. As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the in-combination assessment has the potential to affect up to 4,751 harbour porpoise (8.18% of the CIS MU) (1,007, 2,465 and 1,279, respectively).
- 1.6.5.25 As set out in 1.6.5.15, all SACs are located in excess of 15 km from the Morgan Generation Assets and therefore it can be concluded that the Morgan Generation Assets will not contribute to an in-combination effect on these SACs if using the EDR approach. Figure 1.14 shows the 15 km EDR for the Morgan Generation Assets and 26 km EDR for Transmission Assets (as presented in the Transmission Assets PEIR) and Morecambe Offshore Windfarm: Generation Assets (as presented in the Morecambe Offshore Windfarm: Generation Assets PEIR). In line with the Transmission Assets, the Morecambe Offshore Windfarm: Generation Assets PEIR ruled out potential disturbance to harbour porpoise features of the North Anglesey

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Marine/Gogledd Môn Forol SAC based on lack of overlap of the 26 km EDR for all SACs screened into the HRA Stage 2 ISAA.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

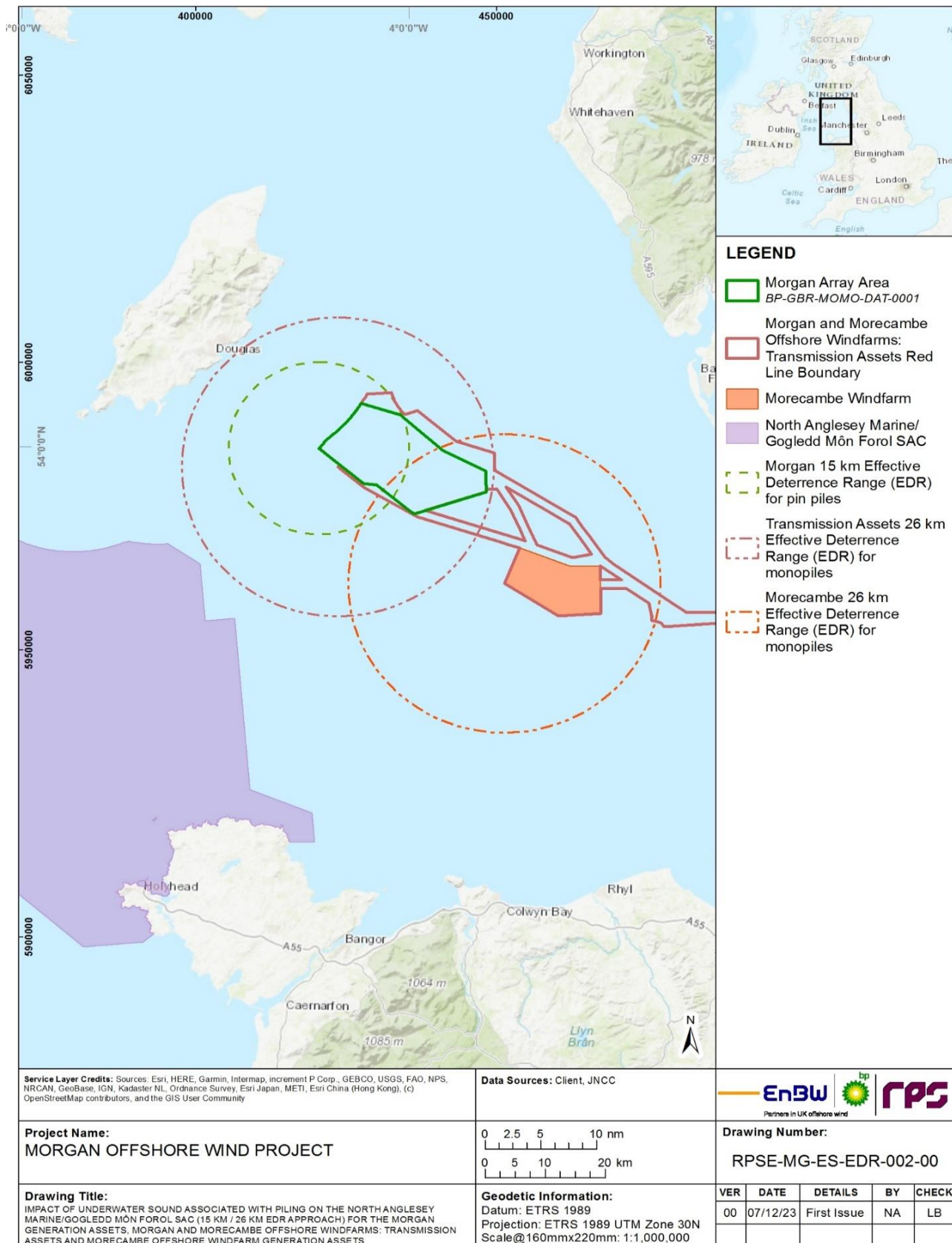


Figure 1.14: Maximum spatial overlap of elevated underwater sound impacts associated with piling at the Morgan Generation Assets, Morgan and Morecambe Offshore Windfarms Transmission Assets and Morecambe Generation Assets, on the North Anglesey Marine/Gogledd Môn Forol SAC, based on the EDR approach.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.26 As set out in paragraph 1.6.5.16, the use of the area-based sounds threshold value of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} identified an overlap of 0.002% of the total North Anglesey Marine/Gogledd Môn Forol SAC at the Morgan Generation Assets. Averaged over the season (summer, 183 days), this equates to a daily footprint of 0.06 km², over 114 days of piling across the construction phase (or 0.001% of the relevant area of the SAC affected over the season). The unweighted 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} sound contour approach has not been applied to the assessment of disturbance for harbour porpoise features with Transmission Assets or Morecambe Offshore Windfarm: Generation Assets, as this would require the generation of project-specific unweighted 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} sound contours for Transmission Assets, which are not publicly available.
- 1.6.5.27 As overlap of the SAC, applying the EDR approach, was ruled out in both the Transmission Assets and Morecambe Offshore Windfarm: Generation Assets, there is no increase in disturbance to the North Anglesey Marine/Gogledd Môn Forol SAC compared to the project alone (0.002% on any given day). This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the SAC over the season.

Bottlenose dolphin, grey seal, harbour seal

- 1.6.5.28 The consequences of potential simultaneous piling in 2027 and 2028, i.e. larger area of strong disturbance compared to the Morgan Generation Assets alone and longer duration of the effect, are described in more detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).
- 1.6.5.29 As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the in-combination assessment at the Morgan Generation Assets, Transmission Assets and Morecambe Offshore Windfarm: Generation Assets has the potential to affect up to 12 bottlenose dolphin (five, six and one respectively), 153 grey seal (61, 54 and 11 respectively) and five harbour seal (one, one and three respectively). However, this is likely to be an overestimate, given the proximity of the sites and likelihood that sound contours will overlap.
- 1.6.5.30 Population modelling was carried out for Morgan Generation Assets, Transmission Assets and Morecambe Offshore Windfarm: Generation Assets for bottlenose dolphin and grey seal, as presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). This demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation), however, there may be a small reduction in population size for the impacted populations.

Scenario 3: Morgan Offshore Wind Project: Generation Assets together with the Transmission Assets and all other relevant projects

Construction phase

Tier 1

- 1.6.5.31 The construction of Morgan Generation Assets, together with construction of Tier 1 projects identified in Figure 1.12 and Table 1.125 may lead to disturbance to marine mammals during piling. Tier 1 projects screened into the in-combination assessment include Mona Offshore Wind Project, Awel y Môr Offshore Wind Farm, Project Erebus and White Cross Offshore Windfarm.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.32 The assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross Offshore Windfarm did not consider effects on harbour seal, as this species was scoped out. Given, that the cumulative assessment for piling is provided on species-by-species basis, harbour seal will not be considered further for Tier 1 projects.
- 1.6.5.33 There is potential for a cumulative effect of piling at Mona Offshore Wind Project with piling at the Morgan Generation Assets. The maximum duration of piling at Morgan Generation Assets is 114 days over the piling phase between 2027 and 2028. For Mona Offshore Wind Project there will be up to 90 days of piling over the piling phase of two-year phase between 2027 and 2028 (Mona Offshore Wind Ltd, 2023). The potential for temporal overlap of piling activities between Morgan Generation Assets and Awel y Môr is considered likely.
- 1.6.5.34 There is potential for a cumulative effect of piling at Awel y Môr Offshore Wind Farm with piling at the Morgan Generation Assets. The maximum duration of piling at Morgan Generation Assets is 70 days over the piling phase between 2027 and 2028. For Awel y Môr, there will be up to 201 days of piling over the piling phase of 12 months in 2028, within the four year construction phase (RWE, 2022b). The potential for temporal overlap of piling activities between Morgan Generation Assets and Awel y Môr is considered likely. Subsequently, simultaneous piling may take place, generating high levels of underwater sound.
- 1.6.5.35 There is potential for a cumulative effect of piling at White Cross Offshore Windfarm with piling at the Morgan Generation Assets. For White Cross Offshore Windfarm there will be up to six days of piling (five days for WTG mooring pin piles and one day for OSP pin piles) over the piling phase of six months between 2025 and 2027 (onshore and offshore construction phase) (White Cross Offshore Wind Limited, 2023). The potential for temporal overlap of piling activities between the Morgan Generation Assets alongside Mona Offshore Wind Project, Awel y Môr Offshore Wind Farm and White Cross Offshore Windfarm is considered likely. As such, simultaneous piling may occur, generating significant levels of underwater sound.
- 1.6.5.36 Project Erebus is a demonstration scale floating offshore wind farm, comprising six to ten wind turbines and a range of foundation options, including pile driven anchors. The construction is planned to take place in 2025 with only 18 days over which piling may occur. The number of harbour porpoise predicted to be affected by disturbance is based on densities from site-specific surveys (Blue Gem Wind, 2020). It is, however, important to note that Project Erebus is located in close proximity to the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC designated for harbour porpoise. The construction of Project Erebus is planned to take place in 2025 with only 18 days over which piling may occur and therefore there is no potential for piling activity to coincide with piling at Morgan Generation Assets or Awel y Môr.
- 1.6.5.37 The potential for temporal overlap of piling activities between Morgan Generation Assets alongside Mona Offshore Wind Project and White Cross Offshore Windfarm (2027) or Morgan Generation Assets alongside Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm (2028) is considered likely. As such, simultaneous piling may occur, generating significant levels of underwater sound. Since the construction phases at Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm commence in 2026, there is no potential for piling activity at Project Erebus to coincide with piling at these projects and therefore, spatially, there would be no larger cumulative area of disturbance as a result of Project Erebus. There is potential for temporal overlap with White Cross Offshore Windfarm in 2025. Temporally, Project Erebus would make a slight contribution to the overall duration of piling.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Harbour porpoise

- 1.6.5.38 As outlined in paragraph 1.6.4.38, the EDR approach has also been used for the assessment of disturbance associated with pile driving during the construction phase for harbour porpoise features in-combination with other plans and projects. As outlined in section 1.6.4 the use of a 15 km EDR rules out potential disturbance from in-combination effects to harbour porpoise features of all SACs screened into the ISAA. All SACs are located in excess of 15 km from the Morgan Generation Assets and therefore it can be concluded that the Morgan Generation Assets will not contribute to an in-combination effect on these SACs if using the EDR approach.
- 1.6.5.39 All Tier 1 projects screened into the in-combination assessment are located out with the 15 km EDR used for the assessment and therefore will not contribute to an in-combination effect on Annex II harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.40 As outlined in paragraph 1.6.4.40, in parallel with the EDR approach, the sound threshold of unweighted 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} (Tougaard *et al.*, 2021) as set out in NRW's 'Position on assessing behavioural disturbance of harbour porpoise from underwater noise' (NRW, 2023) has also been applied. This demonstrated an overlap of 0.002% of the total North Anglesey Marine/Gogledd Môn Forol SAC area for the west piling location (single piling of 4,400 kJ). In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 0.06 km², over 114 days of piling across the construction phase (see Table 1.127) would result in an average of 0.001% of the relevant area of the SAC being affected over the season. This therefore falls well within the threshold of 20% of the relevant area of the site in any given day and 10% of the relevant area of the site over the season. As this is the closest piling location, disturbance associated with all other piling locations within the Morgan Array Area would be reduced. However, the unweighted 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} sound contour approach has not been applied to the assessment of disturbance for harbour porpoise features in-combination with other plans and projects with the exception of the Mona Offshore Wind Project, as this would require the generation of project-specific unweighted 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} sound contours for these Tier 1 projects, which are not publicly available.
- 1.6.5.41 At the Mona Offshore Wind Project the Report to Inform Appropriate Assessment (RIAA) concluded that the footprint of disturbance (based on an EDR of 15 km and a single piling activity at the worst-case location) would rule out potential disturbance to harbour porpoise features of all SACs screened into the ISAA, as there is no potential overlap between the 15 km EDR and the North Anglesey Marine/Gogledd Môn Forol SAC. In parallel with the EDR approach, the sound threshold of unweighted 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} (Tougaard *et al.*, 2021) as set out in NRW's 'Position on assessing behavioural disturbance of harbour porpoise from underwater noise' (NRW, 2023) has also been applied for the Mona Offshore Wind Project. Using the unweighted sound threshold value of 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss}, the SW piling location has the greatest overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (4.33% of the total SAC area) during the single piling scenario with hammer energy of 4,400 kJ, due to proximity, which is below the daily 20% guidance threshold from JNCC (2020). In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 140.67 km², over 114 days of piling across the construction phase (see Table 1.126) would result in an average of 2.69% of the relevant area of the SAC being affected over the season. This therefore falls well below the threshold of 10% of the relevant area of the site over the season.

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- 1.6.5.42 At the Awel y Môr Offshore Wind Farm, the RIAA concluded that the footprint of disturbance (based on an EDR of 26 km and a single piling activity at the worst-case location) would at most be 0.84% of the total area (based on a footprint of disturbance of 27.3 km² within the total North Anglesey Marine/Gogledd Môn Forol SAC area of 3,249 km² of the SAC and therefore well within the daily 20% threshold (other piling locations within the array would have a reduced level of impact) (RWE, 2022b). Should such activity occur every day of the season in sufficient proximity to the site (which would not be possible, as only a limited proportion of the array area falls within 26 km), the contribution to the 10% seasonal threshold would be at most 0.84% and therefore well within the 10% threshold.
- 1.6.5.43 White Cross Offshore Windfarm is located 319.6 km from the Morgan Generation Assets and 246.3 km from the North Anglesey Marine/Gogledd Môn Forol SAC. The White Cross Offshore Windfarm Environmental Statement reported a maximum of 12 km of sound level contours (White Cross Offshore Wind Ltd., 2023), and therefore there is no potential for overlap of the footprint of disturbance with the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.44 Considering there is a potential for temporal overlap of piling activities of Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm, the footprints of disturbance from the all three projects have been summed to assess the potential for in-combination effects. Whilst piling at White Cross Offshore Windfarm could also temporally overlap with Morgan Generation Assets there is no potential for overlap of the footprint of disturbance of White Cross Offshore Windfarm with the North Anglesey Marine/Gogledd Môn Forol SAC, and therefore this has not been included in this approach.
- 1.6.5.45 Using the EDR approaches available in Mona Offshore Wind Project, Awel y Môr Offshore Wind Farm and the Morgan Generation Assets the disturbance footprints associated with these projects in-combination would result in potential disturbance across an area equating to 0.84% of the total area of the SAC (see paragraphs 1.6.5.38, 1.6.5.41 and 1.6.5.42). This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.
- 1.6.5.46 It is acknowledged that a number of methods are available to determine the potential for significant disturbance to marine mammals, which means most individual project assessments are not directly comparable. This excludes the Mona Offshore Wind Project and the Morgan Generation Assets, which can be compared, as both projects use the same methodology to determine the potential for significant disturbance to marine mammals. A highly precautionary approach has been used for the assessment, which uses the 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{ss} sound threshold approach for Morgan Generation Assets and the Mona Offshore Wind Project in-combination with the EDR ranges from Awel y Môr Offshore Wind Farm; the disturbance footprints associated with both projects would result in potential disturbance across an area equating to 5.172% of the total area of the SAC per day, which is well below the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season. These disturbance footprints for the three relevant projects are presented below in Figure 1.15.

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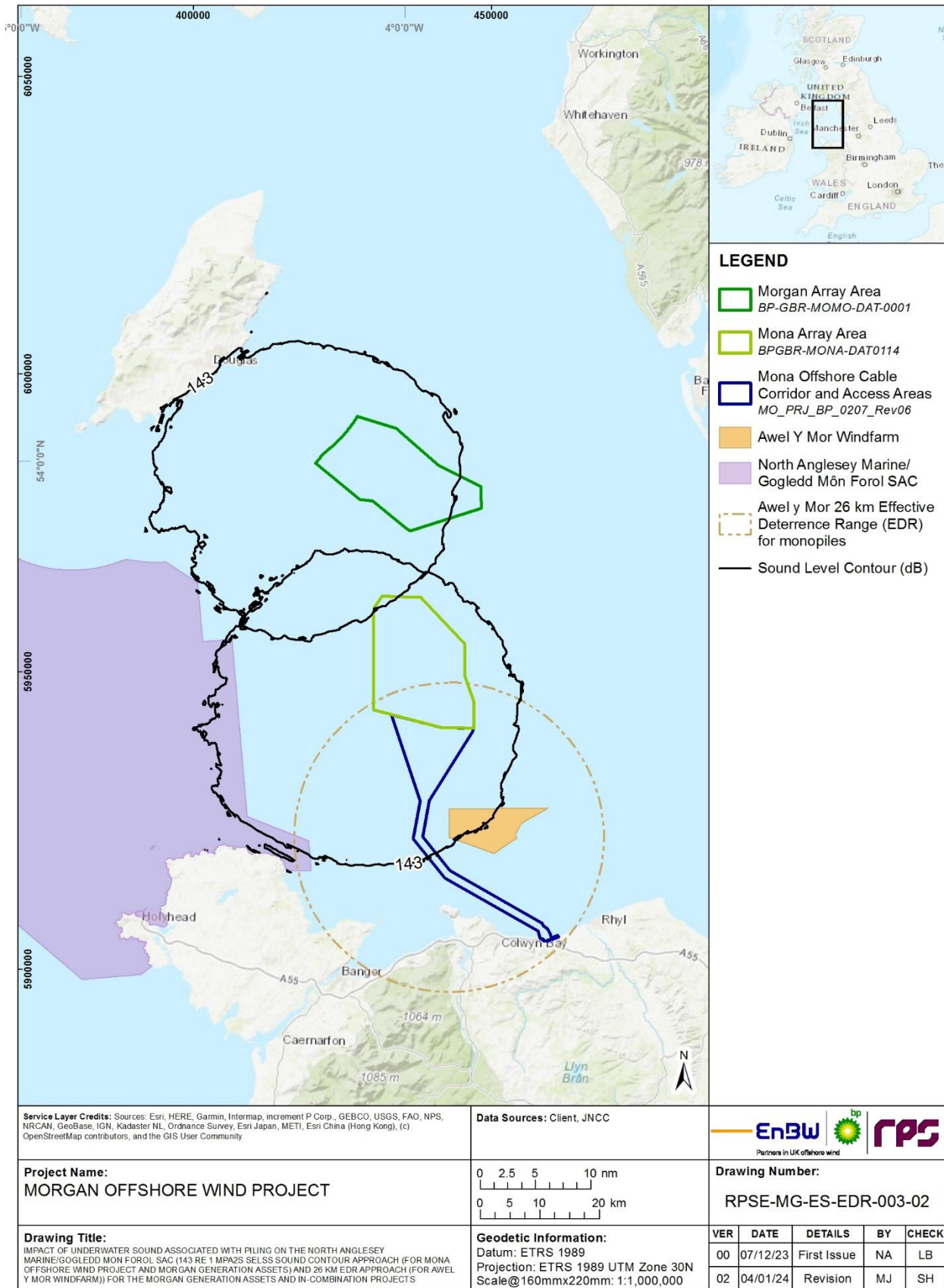


Figure 1.15: Impact of elevated underwater sound associated with piling on the North Anglesey Marine/Gogledd Mon Forol SAC from the Morgan Generation Assets, Mona Offshore Wind Project (143 dB re 1 µPa2s SEL_{SS} approach) and Awel Y Mor Offshore Windfarm (26 km EDR approach).

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Bottlenose dolphin

- 1.6.5.47 The potential for temporal overlap of piling activities between Morgan Generation Assets alongside Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm is considered likely. The consequences of potential simultaneous piling in 2028, i.e. larger area of strong disturbance compared to the Morgan Generation Assets alone and longer duration of the effect, are described in more detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).
- 1.6.5.48 Only projects within the bottlenose dolphin IS MU will be assessed for the in-combination assessment for bottlenose dolphin, as this MU largely represents the coastal bottlenose dolphin ecotype (of which there are only a few hundred). Therefore, Project Erebus and White Cross Offshore Windfarm, which lie in the Offshore Channel and Southwest England MU (offshore ecotype), is not considered for this species. This approach was agreed with the marine mammal EWG.
- 1.6.5.49 As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the in-combination assessment therefore assumes piling at Morgan Generation Assets and Mona Offshore Wind Project in 2027 affecting up to five and seven bottlenose dolphin, respectively. Subsequently piling at Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm in 2028 (potentially affecting five, seven and 23 bottlenose dolphin respectively) which may coincide and potentially affect up to 35 bottlenose dolphin (11.94% of the IS MU in total), see Table 1.127. However, this is likely to be an overestimate given highly precautionary densities were used for the respective assessments and that, due to the proximity of the sites, the sound contours are likely to overlap.
- 1.6.5.50 For additional context, modelling for Tier 1 projects presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) (i.e. Morgan Generation Assets alongside Mona Offshore Wind Project and Awel y Môr Offshore Wind farm) demonstrated these changes are not enough to significantly affect the population trajectory over a generational scale (i.e. the trajectory falls within natural variation). There may, however, be a small reduction in population size for the impacted population with seven fewer animals at six years (2.04% of the IS MU) and five fewer animals at the time point of 25 years (1.70% of the IS MU). It should, however, be highlighted that these small differences are predicted against a background of a modelled declining population (based on precautionary demographic parameters recommended by NRW, which uses a 0.22 fertility rate from Arso Civil et al., 2017) (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). As discussed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4, it is important to highlight that whilst any model is sensitive to input parameters, the model chosen represents a conservative assessment of population changes. The trend for the IS MU is stable (though Cardigan Bay appears to have a declining population), and therefore the interpretation is with respect to the difference between the impacted and unimpacted populations.
- 1.6.5.51 As outlined above, it should be noted that this assessment is highly precautionary and does not take into account the measures adopted as part of the Morgan Generation Assets that are outlined in Table 1.56.

Grey seal

- 1.6.5.52 Table 1.127 provides information detailing the duration of piling associated with Tier 1 projects considered in the in-combination assessment for grey seal.

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1.6.5.53 As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the in-combination assessment therefore assumes there would be piling at Project Erebus in 2025 affecting 18 grey seal, and piling at White Cross Offshore Windfarm, affecting up to 10 grey seal. Subsequently, there would be piling in 2027 at Morgan Generation Assets, affecting up to 61 grey seal, Mona Offshore Wind Project affecting up to 31 grey seal and piling at White Cross Offshore Windfarm. In 2028, there would be piling at Morgan Generation Assets; Mona Offshore Wind Project; and Awel y Môr Offshore Wind Farm which may coincide and affect up to 183 grey seal (1.42% of the GSRP or 0.3% of the OSPAR Region III reference population).

1.6.5.54 Modelling of Tier 1 projects presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) considered that there is no potential for long-term effects on this species.

Tier 2

1.6.5.55 There may be a temporal overlap between the construction of the Morgan Generation Assets and the construction of Tier 1 projects and the following Tier 2 projects: Transmission Assets (assessed in paragraph 1.6.5.12 to 1.6.5.20), Morecambe Generation Assets (assessed in paragraphs 1.6.5.23 to 1.6.5.30), Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park, Llŷr 1, Llŷr 2, North Celtic Sea Offshore Wind Farm, North Channel Wind 1, North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen, Project Valorous, Shelmalere Offshore Wind Farm and Simply Blue Emerald. This may lead to in-combination disturbance to Annex II marine mammal features from piling.

1.6.5.56 The indicative timelines suggest that there will be a temporal overlap of construction phase of Morgan Generation Assets with the construction phases of all listed tier 2 projects. The construction phase of the Llŷr projects finishes in 2025 but both projects are screened into cumulative assessment due to the potential for sequential piling. The construction dates are unknown for Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, North Celtic Sea Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm and Project Ilen, however, conservatively these projects were screened into the cumulative assessment in the event that a temporal overlap occurs. It is noted that the description of the projects provided in the respective EIA Scoping Reports is indicative and may be further refined.

1.6.5.57 The EIA Scoping Reports do not provide detailed information about impacts of elevated underwater sound as a result of piling and therefore it is not possible to undertake a full, quantitative assessment for this impact. As such, a qualitative assessment is provided below. For the Transmission Assets and Morecambe Generation Assets PEIRs are available and more detailed information is included above, in paragraph 1.6.5.12 *et seq.* and paragraphs 1.6.5.23 *et seq.* respectively.

1.6.5.58 In temporal terms, the first construction phases are anticipated to start in 2025, for North Irish Sea Array and the Llŷr Projects. The construction of some of the cumulative projects will last until 2029, including Inis Ealga Marine Energy Park, Transmission Assets, North Channel Wind 1 and 2, and Shelmalere Offshore Wind Farm. This timescale constitutes a total of five years where construction activities, including piling, may occur across the Irish and Celtic Seas. Piling activities will occur intermittently over the construction phase of respective projects, therefore, whilst this will not result in a continuous risk of disturbance to marine mammals, it may affect multiple breeding

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seasons for marine mammal species. In the context of the life cycle of respective species (see Volume 4, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference F4.4.1) for more details), the duration of the impact is classified as medium term, as the exposure to elevated sound levels could occur over a meaningful proportion of their lifespan.

1.6.5.59 Additionally, in spatial terms depending on the type of foundation installation technique, piling at each wind farm is likely to affect marine mammals behaviourally over different spatial scales. Due to the proximity of Morecambe Offshore Wind Farm Generation Assets, Transmission Assets, North Irish Sea Array and Oriel Offshore Wind Farm to the Morgan Generation Assets, there is a potential for overlap of sound disturbance contours during piling. Animals may be displaced from an area comparable to piling contours at the Morgan Generation Assets alone (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). However, where there is a potential for simultaneous piling to take place, it may potentially result in a larger area of strong disturbance (160 dB re 1 μ Pa SPL_{rms}) compared to piling at the Morgan Generation Assets alone.

1.6.5.60 In the context of the wider habitat available within the Irish Sea and wider Celtic Sea Morgan regional marine mammal study area, it is anticipated that this will not result in a long-term population-level effect on harbour porpoise, grey seal or harbour seal. There was also no noticeable difference in the iPCoD models with the addition of the Tier 2 projects Morecambe Offshore Wind Farm Generation Assets, and Transmission Assets.

However, cumulative piling of Tier 1 and Tier 2 projects could contribute to a reduction in IS MU population size for bottlenose dolphin, although it must be noted there was a difference of only one animal in the iPCoD model with the addition of the Tier 2 projects (Morecambe Offshore Wind Farm Generation Assets and Transmission Assets) to the Tier 1 cumulative scenario for Morgan Generation Assets alone.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.6.5.61 For Scenario 1 (see paragraphs 1.6.5.13 to 1.6.5.17), the in-combination assessment for piling at the Morgan Generation Assets and the Transmission Assets has the potential to affect up to 3,472 harbour porpoise (5.5% of the CIS MU) (1,007 and 2,465, respectively). In addition, when applying the EDR approach (see Figure 1.13), there is no increase in disturbance to the North Anglesey Marine/Gogledd Môn Forol SAC compared to the project alone (0.002% on any given day). This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the SAC over the season.

1.6.5.62 For Scenario 2 (see paragraphs 1.6.5.24 to 1.6.5.27), from in-combination piling at Morgan Generation Assets, Transmission Assets and Morecambe Offshore Wind Project: Generation Assets, up to 4,751 harbour porpoise (8.18% of the CIS MU) (1,007, 2,465 and 1,279, respectively) may potentially be affected. In addition, when applying the EDR approach, there is no increase in disturbance to the North Anglesey Marine/Gogledd Môn Forol SAC compared to the project alone (0.002% on any given day). This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the SAC over the season.

1.6.5.63 The assessment of disturbance on harbour porpoise features associated with pile driving during the construction phase of the Morgan Generation Assets in-combination with other plans and projects considered under Scenario 3 is presented in paragraphs

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1.6.5.38 to 1.6.5.46. The assessment concluded that for both the EDR approach and the 143 dB re 1 $\mu\text{Pa}^2\text{s}$ SEL_{SS} sound threshold approach for the Morgan Generation Assets and the Mona Offshore Wind Project in-combination with the EDR ranges from Awel y Môr Offshore Wind Farm, the potential disturbance would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

Conclusions

- 1.6.5.64 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound during piling during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of underwater sound generated from piling against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.128. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.128: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>As outlined in paragraph 1.6.5.16, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from piling at Morgan Generation Assets would be 0.002% (on any given day) which does not exceed either of the thresholds for significant disturbance in the SAC.</p> <p>As outlined in paragraph 1.6.5.17 the Transmission Assets (and as presented in the Transmission Assets PEIR) identified no overlap of the 26 km EDR with the North Anglesey Marine/Gogledd Môn Forol Sac.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not cause significant disturbance of harbour porpoise.</p>	<p>As outlined in paragraph 1.6.5.26, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from piling at Morgan Generation Assets would be 0.002% (on any given day) which does not exceed either of the thresholds for significant disturbance.</p> <p>As outlined in paragraph 1.6.5.27, both the Transmission Assets and the Morecambe Offshore Windfarm identified no overlap of the 26 km EDR with the North Anglesey Marine/Gogledd Môn Forol SAC (as presented in the Transmission Assets PEIR and in the Morecambe Generation Assets PEIR) .</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets will not cause significant disturbance of harbour porpoise.</p>	<p>As outlined in paragraph 1.6.5.26, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from the Morgan Generation Assets, Transmission Assets, Tier 1, Tier 2 and Tier 3 projects considered within the in-combination assessment (as presented in Table 1.125 and paragraphs 1.6.5.31 to 1.6.5.60) would be 5.17% (on any given day) which does not exceed either of the thresholds for significant disturbance.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1 and Tier 2 projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with other projects will not cause significant disturbance of harbour porpoise.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) In-combination with the Transmission Assets (as presented in the Transmission Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p> <p>Therefore, under Scenario 1, there is no potential for in-combination effects.</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) In-combination with the Transmission Assets (as presented in the Transmission Assets PEIR) and the Morecambe Offshore Windfarm: Generation Assets (as presented in the Morecambe Offshore Windfarm: Generation Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p> <p>Therefore, under Scenario 2, there is no potential for in-combination effects.</p>	<p>Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) In-combination with the Transmission Assets, Tier 1, Tier 2 and Tier 3 projects (as detailed in respective publications), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p> <p>Therefore, under Scenario 3, there is no potential for in-combination effects.</p>

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- 1.6.5.65 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

- 1.6.5.66 The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from the Morgan Array Area), assessed in paragraphs 1.6.5.13 to 1.6.5.46. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.67 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound during piling during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.129. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.129: Conclusions against the conservation objectives of the North Channel SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>As summarised in Table 1.128, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from piling at Morgan Generation Assets would be 0.002% (on any given day) which does not exceed either of the thresholds for significant disturbance for the SAC. Further there was no overlap identified with the 26 km EDR of the North Anglesey Marine/Gogledd Môn Forol SAC and the Transmission Assets (as presented in the Transmission Assets PEIR).</p> <p>The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude (i.e. no more than one individual affected by PTS).</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated</p>	<p>As outlined in section 1.6.4, the 15 km EDR for the Morgan Generation Assets does not overlap with the North Channel SAC (located 64 km from the Morgan Array Area). Therefore, underwater sound from piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Generation Assets (as presented in the projects' respective PEIRs) will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with these projects will not cause significant disturbance of harbour porpoise.</p>	<p>As outlined in section 1.6.4, the 15 km EDR for the Morgan Generation Assets does not overlap with the North Channel SAC (located 64 km from the Morgan Array Area). Therefore, underwater sound from piling associated with the Morgan Generation Assets in-combination with the Transmission Assets, Tier 1, Tier 2 and Tier 3 projects (as presented in Table 1.125 and paragraphs 1.6.5.31 to 1.6.5.60) will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the projects considered under Scenario 3 will not cause significant disturbance of harbour porpoise.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not cause significant disturbance of harbour porpoise.		
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained	Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) in-combination with the Transmission Assets (as presented in the Transmission Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.	Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) in-combination with the Transmission Assets (as presented in the Transmission Assets PEIR) and the Morecambe Offshore Windfarm: Generation Assets (as presented in the Morecambe Offshore Windfarm: Generation Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.	Habitats and processes will not be affected by elevated underwater sound during piling. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) in-combination with the Transmission Assets (as presented in the Transmission Assets PEIR), Tier 1, Tier 2 and Tier 3 projects, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.

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- 1.6.5.68 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

- 1.6.5.69 For Scenario 1 (see paragraphs 1.6.5.18 to 1.6.5.20), during piling at Morgan Generation Assets and Transmission Assets, up to 2 harbour seal may potentially be disturbed, which is unlikely to significantly affect populations trajectories over a generational scale (i.e. the trajectory falls within natural variation).
- 1.6.5.70 For Scenario 2 (see paragraphs 1.6.5.28 to 1.6.5.30), during piling at Morgan Generation Assets, Transmission Assets and Morecambe Offshore Wind Project: Generation Assets, up to five harbour seal may potentially be disturbed which is unlikely to significantly affect populations trajectories over a generational scale (i.e. the trajectory falls within natural variation).
- 1.6.5.71 For Scenario 3 (see paragraphs 1.6.5.34 to 0) ,the assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross Offshore Wind Farm did not consider effects on harbour seal, as this species was scoped out due to a lack of presence within the site specific digital aerial surveys. For Mona Offshore Wind Project during piling in-combination with Morgan Generation Assets up to 2 harbour seal may potentially be disturbed which equates to 0.14% of the reference population. No quantitative information was presented for EIA Scoping Reports for other Tier 2 projects.
- 1.6.5.72 Harbour seal have a large foraging range (up to 273 km reported in Carter *et al.* (2022)) and could therefore move to alternative foraging grounds during piling associated with the Morgan Generation Assets and other projects considered in the in-combination assessment.
- 1.6.5.73 Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr in 2028.

Conclusions

- 1.6.5.74 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound during piling during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraph 1.6.2.19) are discussed in Table 1.130. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.130: Conclusions against the conservation objectives of the Strangford Lough SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20, elevated underwater sound from piling at the Morgan Generation Assets in-combination with the Transmission Assets may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented above for Scenario 1 are inconsequential in the context of the harbour seal reference population.</p> <p>As outlined in paragraphs 1.6.5.69 to 1.6.5.73, the population modelling carried out for Scenario 1 demonstrated that any changes to harbour seal populations are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>Harbour seal also have a large foraging range (up to 273 km reported in Carter <i>et al.</i> (2022)) and could therefore move to alternative foraging grounds during piling associated with the Morgan Generation Assets and the Transmission Assets. Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour seal using the SAC and harbour seal will be maintained (or restored where appropriate) to favourable condition. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, elevated underwater sound from the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented above for Scenario 2 are inconsequential in the context of the harbour seal reference population.</p> <p>As outlined in paragraphs 1.6.5.69 to 1.6.5.73, the population modelling carried out for Scenario 2 demonstrated that any changes to harbour seal populations are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not affect the survivability and reproductive potential of harbour seal using the SAC and harbour seal will be maintained (or restored where appropriate) to favourable condition. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the projects considered under Scenario 2 will not cause significant disturbance of harbour</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets in-combination with the Transmission Assets, other Tier 1, Tier 2 and Tier 3 projects considered within the in-combination assessment (as presented in Table 1.125 and paragraphs 1.6.5.31 to 1.6.5.60) may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented above for Scenario 3 are inconsequential in the context of the harbour seal reference population (see below).</p> <p>In the context of the wider habitat available within the Irish Sea and wider Celtic Sea regional Morgan marine mammal study area, it is anticipated that this in-combination impact will not result in a long-term population-level effect on the harbour seal. There was also no noticeable difference in the iPCoD models with the addition of the Tier 2 projects Morecambe Offshore Wind Farm Generation Assets, and the Transmission Assets.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets, other Tier 1, Tier 2 and Tier 3 projects will not affect the survivability and reproductive potential of harbour seal using the SAC and harbour seal will be maintained (or restored where</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	Transmission Assets will not cause significant disturbance of harbour seal, and so will not affect the harbour seal population.	seal, and so will not affect the harbour seal population.	appropriate) to favourable condition. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the projects considered under Scenario 3 will not cause significant disturbance of harbour seal, and so will not affect the harbour seal population.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site	There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets (as presented in the Transmission Assets PEIR) to result in adverse effects on the physical features used by the harbour seal features within the site.	There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets (as presented in the respective projects PEIRs) to result in adverse effects on the physical features used by the harbour seal features within the site.	There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the other projects considered under Scenario 3 to result in adverse effects on the physical features used by the harbour seal features within the site.

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- 1.6.5.75 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of Strangford Lough SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Murlough SAC

Harbour seal

- 1.6.5.76 The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC (94.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.69 to 1.6.5.75. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.77 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound during piling during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraph 1.6.2.24) are discussed in Table 1.131. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.131: Conclusions against the conservation objectives of the Murlough SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>As summarised in Table 1.130, the piling at the Morgan Generation Assets in-combination with the Transmission Assets may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented for Scenario 1 (see paragraph 1.6.5.69) are inconsequential in the context of the harbour seal reference population.</p> <p>The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude (i.e. no more than two harbour seals would be affected for Scenario 1).</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour seal using the SAC and harbour seal will be maintained (or restored where appropriate) to favourable condition. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not cause significant disturbance of harbour seal, and</p>	<p>As summarised in Table 1.130, the piling at the Morgan Generation Assets in-combination with the Transmission Assets and with the Morecambe Generation Assets may result in disturbance of Annex II harbour seal features of the SAC. However, the numbers presented for Scenario 2 (see paragraph 1.6.5.70) are inconsequential in the context of the harbour seal reference population.</p> <p>The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and with the Morecambe Generation Assets will not affect the survivability and reproductive potential of harbour seal using the SAC and harbour seal will be maintained (or restored where appropriate) to favourable condition. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and with the</p>	<p>As summarised in Table 1.130, the piling at the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.71) are inconsequential in the context of the harbour seal reference population. In addition, as concluded for the Strangford Lough SAC, there will be any long-term population-level effects on the harbour seal with the addition of Tier 2 or Tier 3 projects.</p> <p>The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects will not affect the survivability and reproductive potential of harbour seal using the SAC and harbour seal will be maintained (or restored where appropriate) to favourable condition. Similarly, elevated</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>so will not affect the harbour seal population.</p>	<p>Morecambe Generation Assets will not cause significant disturbance of harbour seal, and so will not affect the harbour seal population.</p>	<p>underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects will not cause significant disturbance of harbour seal, and so will not affect the harbour seal population.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets (as presented in the Transmission Assets PEIR) to result in adverse effects on the physical features used by the harbour seal features within the site.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets (as presented in the respective projects PEIRs) to result in adverse effects on the physical features used by the harbour seal features within the site.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the other projects considered under Scenario 3 to result in adverse effects on the physical features used by the harbour seal features within the site.</p>

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1.6.5.78 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of Murlough SAC as a result of elevated underwater sound during piling respect to the Morgan Generation Assets in combination with other plans/projects.

Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC

Bottlenose dolphin

1.6.5.79 Given that bottlenose dolphin can travel over large distances, there is a possibility that a small number of individuals from the SAC may be occasionally present within the disturbance contours.

1.6.5.80 For Scenario 1 (see paragraphs 1.6.5.18 to 1.6.5.20 during piling at Morgan Generation Assets and Transmission Assets, there is potential to affect up to 11 bottlenose dolphin, which is unlikely to significantly affect populations trajectories over a generational scale (i.e. the trajectory falls within natural variation).

1.6.5.81 For Scenario 2 (see paragraphs 1.6.5.28 to 1.6.5.30) during piling at Morgan Generation Assets, Transmission Assets and Morecambe Offshore Wind Project: Generation Assets, there is potential to affect up to 12 bottlenose dolphin, which is unlikely to significantly affect populations trajectories over a generational scale (i.e. the trajectory falls within natural variation).

1.6.5.82 For Scenario 3 (see paragraphs 1.6.5.31 to 0), it is considered likely that there is potential for a temporal overlap of piling of Tier 1 projects. The in-combination assessment therefore assumes piling at Morgan Generation Assets and Mona Offshore Wind Project in 2027 affecting up to five and seven bottlenose dolphins, respectively. Subsequently piling at Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm in 2028 (affecting five, seven and 23 bottlenose dolphins respectively) which may coincide and affect up to 35 bottlenose dolphins (11.94% of the IS MU in total). Modelling for Tier 1 projects demonstrated that these changes are not enough to significantly affect the population trajectory over a generational scale (i.e. the trajectory falls within natural variation). However, cumulative piling of Tier 1 and Tier 2 projects could contribute to a reduction in IS MU population size for bottlenose dolphin, although it must be noted there was a difference of only one animal in the iPCoD model with the addition of the Tier 2 projects (Morecambe Offshore Wind Farm Generation Assets and Transmission Assets) to the Tier 1 cumulative scenario for Morgan Generation Assets alone. However, based on the iPCoD modelling (presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement), these changes are not enough to significantly affect the population trajectory over a generational scale (i.e. the trajectory falls within natural variation).

Grey seal

1.6.5.83 For Scenario 1 (see paragraphs 1.6.5.18 to 1.6.5.20) during piling at Morgan Generation Assets and Transmission Assets, there is potential to affect up to 142 grey seal, which is unlikely to significantly affect populations trajectories over a generational scale (i.e. the trajectory falls within natural variation).

1.6.5.84 For Scenario 2 (see paragraphs 1.6.5.28 to 1.6.5.30) during piling at Morgan Generation Assets, Transmission Assets and Morecambe Offshore Wind Project: Generation Assets, there is potential to affect up to 153 grey seal, which is unlikely to significantly affect populations trajectories over a generational scale (i.e. the trajectory falls within natural variation).

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1.6.5.85 For Scenario 3 (paragraphs 1.6.5.34 to 0), the in-combination assessment assumes there would be piling at Project Erebus in 2025 affecting 18 grey seal, and piling at White Cross Offshore Windfarm, affecting up to 10 grey seal. Subsequently, there would be piling in 2027 at Morgan Generation Assets, affecting up to 61 grey seal, Mona Offshore Wind Project affecting up to 31 grey seal and piling at White Cross Offshore Windfarm. In 2028, there would be piling at Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm which may coincide and affect up to 183 grey seal (1.42% of the GSRP or 0.3% of the OSPAR Region III) reference population. Therefore, it was concluded that for in-combination effects from piling at Tier 1 projects there is no potential for long term effects on grey seal. For Tier 2 projects, there was no noticeable difference in the population modelling with the addition of these projects. Therefore, in the context of the wider habitat available within the Irish Sea and wider Celtic Sea Morgan regional marine mammal study area, it is anticipated that this will not result in a long-term population-level effect on grey seal.

Conclusions

1.6.5.86 It is concluded that no adverse effects on the qualifying bottlenose dolphin and grey seal features which undermine the conservation objectives of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC will occur for grey seal or bottlenose dolphin as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.34 to 1.6.2.36) are discussed in Table 1.132.

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Table 1.132: Conclusions against the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 11 bottlenose dolphin and 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>Given the overlap of projects and proximity of piling events, it is expected that animals would potentially be disturbed over a very similar area and a large proportion of disturbance contours are predicted to overlap. Therefore, any cumulative disturbance numbers presented are likely to be overestimates.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the population from maintaining itself on a long-term basis as a viable component of its natural habitat.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets (Scenario 2) may result in disturbance of Annex II grey seal and bottlenose dolphin features of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 12 bottlenose dolphin and 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not prevent the population from maintaining itself on a long-term basis as a viable component of its natural habitat.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound during piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects (Scenario 3) may result in disturbance of Annex II grey seal and bottlenose dolphin features of the SAC, however the numbers presented above for Scenario 3 will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The in-combination assessment for elevated underwater sound for Scenario 3 Tier 1 Projects Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr Offshore Wind Farm has the potential to affect up to 35 bottlenose dolphin and 183 grey seal. It was demonstrated through population modelling that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>For the grey seal feature of the SAC, with the addition of Tier 2 projects, there was no noticeable difference in the population modelling with the addition of these projects. Therefore, in the context of the wider habitat available within the Irish Sea and wider Celtic Sea Morgan regional marine mammal study area, it is anticipated</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>that this will not result in a long-term population-level effect on grey seal.</p> <p>However, for the bottlenose dolphin feature of the SAC, cumulative piling of Tier 1 and Tier 2 projects could contribute to a reduction in IS MU population size for bottlenose dolphin. However, based on the iPCoD modelling, these changes are not enough to significantly affect the population trajectory over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>Therefore, for both the grey seal and bottlenose dolphin features of the SAC, it is not expected that elevated underwater sound for the Morgan Generation Assets In-combination with the projects considered under Scenario 3 will prevent the population is maintaining itself on a long-term basis as a viable component of its natural habitat.</p>
<p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 11 bottlenose dolphin and 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>Given the overlap of projects and proximity of piling events, it is expected that animals</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets (Scenario 2) may result in disturbance of Annex II grey seal and bottlenose dolphin features of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 12 bottlenose dolphin and 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects (Scenario 3) may result in disturbance of Annex II grey seal and bottlenose dolphin features of the SAC, however the numbers presented above for Scenario 3 will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in In-combination effects from elevated underwater sound from piling associated with the Morgan Generation</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>would potentially be disturbed over a very similar area and a large proportion of disturbance contours are predicted to overlap. Therefore, any cumulative disturbance numbers presented are likely to be overestimates.</p> <p>In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets are not anticipated to significantly reduce the population or make it likely that it would be reduced in the foreseeable future.</p>	<p>trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 2 are not anticipated to significantly reduce the population or make it likely that it would be reduced in the foreseeable future.</p>	<p>Assets and the projects considered under Scenario 3 are not anticipated to significantly reduce the population or make it likely that it would be reduced in the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>The presence, abundance, condition and diversity of habitats will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with Transmission Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and the Transmission Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of bottlenose dolphin and grey seal within the site and</p>	<p>The presence, abundance, condition and diversity of habitats will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with Scenario 2 projects (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and the Transmission Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of bottlenose dolphin and grey seal within the site and</p>	<p>The presence, abundance, condition and diversity of habitats will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with Scenario 3 projects (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and the Transmission Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of bottlenose dolphin and grey seal within the site and</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	populations beyond the site will not be prevented from remaining stable or increasing.	populations beyond the site will not be prevented from remaining stable or increasing.	populations beyond the site will not be prevented from remaining stable or increasing.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.87 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

The Maidens SAC

Grey seal

- 1.6.5.88 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.83 to 1.6.5.88. As The Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.89 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraph 1.6.2.55) are discussed in Table 1.133.

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Table 1.133: Conclusions against the conservation objectives of The Maidens SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation). The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude. As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at other projects may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation). As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at other Tier 1 projects may result in disturbance of Annex II grey seal feature of the SAC, however the numbers presented above for Scenario 3 will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation). The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude. Therefore for the grey seal feature of the SAC, it is not expected that elevated underwater sound for the Morgan Generation Assets In-combination with the Scenario 3 projects will prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20, although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 2 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets and the Transmission Assets In-combination with other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.85) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 3 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.90 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

- 1.6.5.91 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.79 to 1.6.5.87. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generations Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Grey seal

- 1.6.5.92 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.5.109.

Conclusions

- 1.6.5.93 It is concluded that no adverse effects on the qualifying bottlenose dolphin features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.61 to 1.6.2.65) are discussed in Table 1.134.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.134: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 11 bottlenose dolphin. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the population from maintaining itself on a long-</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II bottlenose dolphin and bottlenose dolphin features of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 12 bottlenose dolphin. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not prevent the population from maintaining itself on a long-term basis as a viable component of its natural habitat.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II bottlenose dolphin feature of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.82) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>Therefore for the bottlenose dolphin feature of the SAC, it is not expected that elevated underwater sound for the Morgan Generation Assets In-combination with the projects considered under Scenario 3 will prevent the population from maintaining</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>term basis as a viable component of its natural habitat.</p> <p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 11 bottlenose dolphin. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not reduce the population in its natural range or reduce the population in the foreseeable future.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II bottlenose dolphin and bottlenose dolphin features of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 12 bottlenose dolphin. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not reduce the population in its natural range or reduce the population in the foreseeable future.</p>	<p>itself on a long-term basis as a viable component of its natural habitat.</p> <p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II bottlenose dolphin features of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.82) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 3 are not anticipated to reduce the population in its natural range or reduce the population in the foreseeable future.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>The presence, abundance, condition and diversity of habitats will not be affected by underwater sound from pilling associated with the Morgan Generation Assets in-combination with the Transmission Assets. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with the Transmission Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and the Transmission Assets PEIR, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of bottlenose dolphin within the site and population beyond the site will not be prevented from remaining stable or increasing.</p>	<p>The presence, abundance, condition and diversity of habitats will not be affected by underwater sound from pilling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Offshore Windfarm (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and the Transmission Assets and Morecambe Offshore Windfarm PEIRs, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of bottlenose dolphin within the site and population beyond the site will not be prevented from remaining stable or increasing.</p>	<p>The presence, abundance, condition and diversity of habitats will not be affected by underwater sound from pilling associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the projects considered under Scenario 3 (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of bottlenose dolphin within the site and population beyond the site will not be prevented from remaining stable or increasing.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.94 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of Cardigan Bay/Bae Ceredigion SAC Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

- 1.6.5.95 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.79 to 1.6.5.87. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.96 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.71 to 1.6.2.74) are discussed in Table 1.135.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.135: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the grey seal feature being maintained (or</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal feature of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.85) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>Therefore, for the grey seal feature of the SAC, it is not expected that elevated underwater sound for the Morgan Generation Assets In-combination with the projects considered under Scenario 3 will prevent the grey seal feature being</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	restored where appropriate) to favourable condition.		maintained (or restored where appropriate) to favourable condition.
To maintain (and if feasible enhance) population numbers and distribution of grey seal	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 2 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.85) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 3) are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.97 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

- 1.6.5.98 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.13 to 1.6.5.46. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.99 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.79 to 1.6.2.80) are discussed in Table 1.136. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.136: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>As summarised in Table 1.128, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from piling at Morgan Generation Assets would be 0.002% (on any given day) which does not exceed either of the thresholds for significant disturbance. Furthermore, there was no overlap identified with the 15 km EDR of the North Anglesey Marine/Gogledd Môn Forol SAC and the Transmission Assets.</p> <p>The Bristol Channel Approaches/ Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the Bristol Channel Approaches/ Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude (i.e. no more than one individual affected by PTS).</p> <p>Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated</p>	<p>As outlined in section 1.6.4, the 15 km EDR for the Morgan Generation Assets does not overlap with the Bristol Channel Approaches/ Dynesfeydd Môr Hafren SAC (located 300.5 km from the Morgan Array Area). Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets will not cause significant disturbance of harbour porpoise.</p>	<p>As outlined in section 1.6.4, the 15 km EDR for the Morgan Generation Assets does not overlap with the Bristol Channel Approaches/ Dynesfeydd Môr Hafren SAC (located 300.5 km from the Morgan Array Area). Therefore, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during piling associated with the Morgan Generation Assets in-combination with the projects considered under Scenario 3 will not cause significant disturbance of harbour porpoise.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	underwater sound during piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not cause significant disturbance of harbour porpoise.		
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained	<p>Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with the Transmission Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) and the Transmission Assets PEIR), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.</p> <p>Therefore, there is no potential for In-combination effects.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.100 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Lundy SAC

Grey seal

1.6.5.101 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.79 to 1.6.5.87. As The Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.102 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.85 to 1.6.2.87) are discussed in Table 1.137. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.137: Conclusions against the conservation objectives of the Lundy SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20, although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Offshore Windfarm may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal feature of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.196) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>Therefore, for the grey seal feature of the SAC, it is not expected that elevated underwater sound for the Morgan Generation Assets In-combination with the projects considered under Scenario 3 will prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20, although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Offshore Windfarm may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 2 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.196) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 3 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.103 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of Lundy SAC as a result of elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

- 1.6.5.104 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.79 to 1.6.5.87. As Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.105 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound during piling during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during piling against each relevant conservation objective (see paragraphs 1.6.2.92 to 1.6.2.94) are discussed in Table 1.138. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.138: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for in-combination elevated underwater sound during piling during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20, although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, in-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at other projects may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for the projects considered under Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, In-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and projects considered in Scenario 2 will not prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal feature of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.196) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>Therefore, for the grey seal feature of the SAC, it is not expected that elevated underwater sound for the Morgan Generation Assets In-combination with the projects considered under Scenario 3 will prevent the grey seal feature being maintained (or restored where appropriate) to favourable condition.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>As outlined in paragraphs 1.6.5.18 to 1.6.5.20 , although likely to be an over estimate given the highly precautionary densities used, the in-combination assessment at the Morgan Generation Assets and Transmission Assets (Scenario 1) has the potential to affect up to 142 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects on the conservation objectives would be of similar if not lower magnitude.</p> <p>As such, in-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.28 to 1.6.5.30, piling at the Morgan Generation Assets In-combination with the Transmission Assets and the Morecambe Generation Assets may result in disturbance of Annex II grey seal feature of the SAC, although likely to be an over estimate given the highly precautionary densities used. The in-combination assessment for Scenario 2 has the potential to affect up to 153 grey seal. However, population modelling demonstrated that these changes are not enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 2 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>	<p>As outlined in paragraphs 1.6.5.32 and 1.6.5.60, elevated underwater sound from piling at the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects may result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above for Scenario 3 (see paragraph 1.6.5.196) will not be enough to significantly affect population trajectories over a generational scale (i.e. the trajectory falls within natural variation).</p> <p>As such, in-combination effects from elevated underwater sound from piling associated with the Morgan Generation Assets and the projects considered under Scenario 3 are not anticipated to prevent population numbers and distribution of grey seal from being maintained.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the Transmission Assets and the Morecambe Generation Assets to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from piling associated with Morgan Generation Assets in-combination with the other projects considered under Scenario 3 to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.5.106 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of Isles of Scilly Complex SAC as a result elevated underwater sound during piling with respect to the Morgan Generation Assets in-combination with other plans/projects.

Sites assessed in line with the iterative approach

- 1.6.5.107 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Report Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.5.64 to 1.6.5.106 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.5.108 to 1.6.5.130.

West Wales Marine/Gorllewin Cymru Forol SAC

- 1.6.5.108 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

- 1.6.5.109 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC (paragraphs 1.6.5.79 to 1.6.5.87), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

- 1.6.5.110 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Saltee Islands SAC

- 1.6.5.111 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.5.79 to 1.6.5.87), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

- 1.6.5.112 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Blasket Islands SAC

- 1.6.5.113 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Mers Celtiques – Talus du golfe de Gascogne SCI

- 1.6.5.114 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Abers – Côte des legends SCI

- 1.6.5.115 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Abers – Côte des legends SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Ouessant-Molène SCI

- 1.6.5.116 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable

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scientific doubt, there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.6.5.117 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.6.5.118 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Tregor Goëlo SCI

1.6.5.119 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côtes de Crozon SCI

1.6.5.120 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Chaussée de Sein SCI

1.6.5.121 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Cap Sizun SCI

- 1.6.5.122 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

- 1.6.5.123 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Vauville SCI

- 1.6.5.124 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

- 1.6.5.125 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

- 1.6.5.126 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

- 1.6.5.127 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

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SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.5.128 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Estuaire de la Rance SCI

1.6.5.129 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.6.5.130 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.64 to 1.6.5.68), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound during piling with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

In-combination injury and disturbance from elevated underwater sound during UXO clearance

1.6.5.131 There is potential for injury and/or disturbance (presented as TTS/moving away response) from elevated underwater sound during UXO clearance as a result of activities associated with the Morgan Generation Assets during construction, in-combination with activities associated with the projects/plans outlined in Table 1.125.

1.6.5.132 As presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), the duration of effect for each UXO detonation is less than one second. Behavioural effects are therefore considered to be negligible in this context. TTS is presented as a temporary auditory injury but also represents a threshold for the onset of the moving away response in line with recommendation from Southall *et al.* (2007).

1.6.5.133 The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would

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represent duplication. Scenario 1 (paragraph 1.6.5.135) presents the assessment of Morgan Generation Assets alongside the Transmission Assets, and Scenario 3 presents the assessment of Morgan Generation Assets alongside the Transmission Assets and relevant Tier 1, Tier 2 and Tier 3 projects (paragraph 1.6.5.141).

- 1.6.5.134 The assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross did not consider effects on harbour seal, as this was not included as a key species in these assessments. Therefore, harbour seal has not been considered further in this in-combination effects section.

Scenario 1: Morgan Generation Assets together with the Transmission Assets

Construction phase

- 1.6.5.135 The construction of the Morgan Generation Assets together with construction phase of the Transmission Assets may lead to in-combination effects of injury and disturbance from elevated underwater sound during UXO clearance.
- 1.6.5.136 The Transmission Assets PEIR assumed there may be up to 51 UXOs requiring clearance. This number includes all UXO likely to be found within the Morgan Generation Assets (n = up to 13), and therefore these UXO are assessed as part of both applications. Out of the 51 UXOs requiring clearance at the Transmission Assets, 38 are considered additional to the those assumed to require clearance at the Morgan Generation Assets and therefore an assessment of the in-combination impact of both projects is presented.
- 1.6.5.137 Although the Transmission Assets PEIR presents a range of impacts for low order clearance as well as low-yield donor charges, the assessment is based on the high order clearance of the maximum UXO size of 907 kg. An explosive mass of 907 kg (high order explosion) yielded the largest PTS ranges for all species, with the greatest injury range (15,370 m) seen for harbour porpoise (Table 1.139). With primary measures in place the assessment found that there would be a residual risk of injury over a range of 2,290 m that would require additional tertiary measures and therefore the Transmission Assets will be adopting standard industry practice (JNCC, 2010b) tertiary measures as part of a MMMP, discussed and agreed with consultees post-consent. Behavioural disturbance (using TTS-onset as a proxy) could affect harbour porpoise across largest range of up to 28 km (Table 1.139). Construction is expected to be from 2026 to 2029 and therefore may have three years of overlap with Morgan Generation Assets, though the exact dates are uncertain at this stage.
- 1.6.5.138 Impacts including PTS and disturbance ranges are similar to those from Morgan Generation Assets and given the local proximity there is potential for in-combination effects to occur with Transmission Assets. Adopting a precautionary approach, and assuming application of standard industry measures (such as MMOs, PAM and ADDs), the assessment considered the magnitude of impact for a high order detonation.

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Table 1.139: Number of animals with the potential to experience onset PTS and disturbance (using TTS-onset as a proxy) during high order UXO clearance at the Transmission Assets and Morgan Generation Assets.

Species	Maximum charge size leading to highest impact (kg)	Metric	Maximum range (m)	Estimated number of animals within impact area
PTS				
Harbour porpoise	907	SPL _{pk}	15,370	416
Bottlenose dolphin			890	<1
Grey seal			3,015	4
Harbour seal				<1
Behavioural disturbance				
Harbour porpoise	907	SPL _{pk}	28,230	1,411
Bottlenose dolphin			1,635	<1
Grey seal			6,470	11
Harbour seal				<1

1.6.5.139 In line with guidance from stakeholders (JNCC, and Natural England) the EDR approach has also been used for the in-combination assessment of disturbance associated with UXO detonation during the construction phase for harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC (as the closest site). The EDR approach, as outlined in JNCC (2020), recommends the use of 26 km deterrence range for UXO. The assessment considered UXO detonation could occur at the closest location within the Morgan Array Area and the Transmission Assets to the North Anglesey Marine/Gogledd Môn Forol SAC.

1.6.5.140 As shown in Figure 1.16 the implementation of a 26 km EDR for the Morgan Generation Assets does not result in any overlap with the North Anglesey Marine/Gogledd Môn Forol SAC, given that it is located 28.2 km away from the Morgan Array Area. The implementation of the 26 km EDR for the Transmission Assets also does not result in an overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (Figure 1.16). Therefore, using the disturbance footprints associated with the Morgan Generation Assets and the Transmission Assets, this does not result in any potential disturbance across an area of the North Anglesey Marine/Gogledd Môn Forol SAC. Therefore, disturbance associated with UXO detonation from both projects in-combination using the 26 km EDR approach would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

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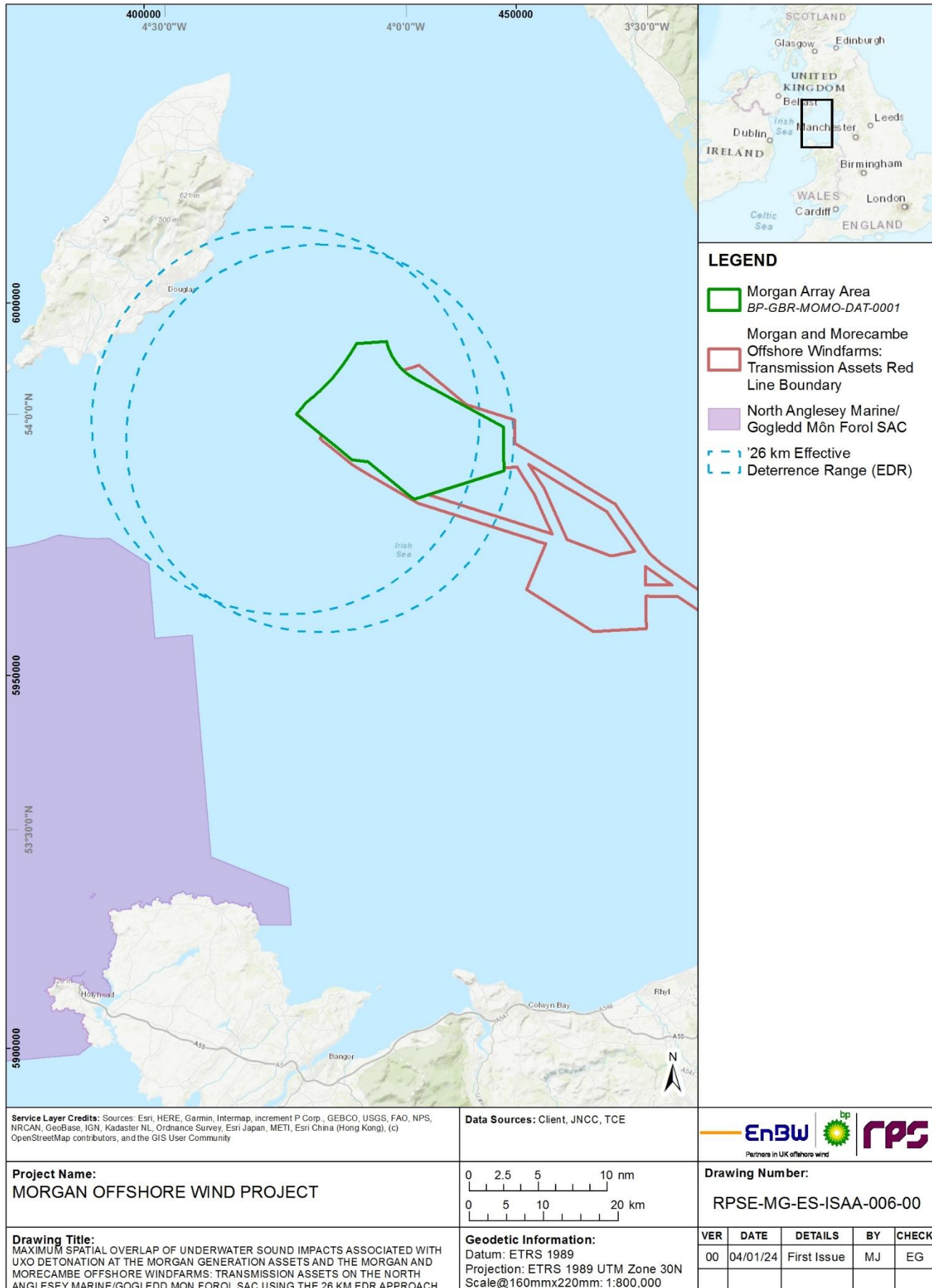


Figure 1.16: Maximum spatial overlap of underwater sound impacts associated with UXO detonation at the Morgan Generation Assets on the North Anglesey Marine/Gogledd Môn Forol SAC using the 26 km EDR approach

Scenario 3: Morgan Generation Assets together with the Transmission Assets and relevant Tier 1, Tier 2 and Tier 3 projects

Construction phase

Tier 1

- 1.6.5.141 The construction of the Morgan Generation Assets, together with construction phase of the Transmission Assets, Mona Offshore Wind Project, Awel y Môr Offshore Wind Farm, Project Erebus and White Cross Offshore Windfarm may lead to in-combination effects of injury and disturbance from elevated underwater sound during UXO clearance.
- 1.6.5.142 Maximum impact ranges from UXO and numbers of animals predicted to be injured as a result of elevated underwater sound during UXO clearance for Tier 1 projects is presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) and Table 1.140. The disturbance ranges and number of animals potentially disturbed as a result of elevated underwater sound during UXO clearance at Tier 1 projects using TTS-onset as a proxy is presented in Table 1.141.
- 1.6.5.143 Mona Offshore Wind Project is located 11.1 km from the Morgan Array Area. As presented in the Mona Offshore Wind Environmental Statement, there will be up to 22 UXOs requiring clearance. Although the Environmental Statement presents a range of impacts for low order clearance as well as low-yield donor charges, the assessment is based on the high order clearance of the maximum UXO size of 907 kg (Table 1.140). The Environmental Statement assessed both PTS, disturbance as well as TTS as a result of UXO clearance, additional information on the assessment method is detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). The Mona Offshore Wind Project Environmental Statement identified that there would be a residual risk of injury for harbour porpoise over a range of 2,290 m (SPL_{pk} metric) that would require further mitigation. Mona Offshore Wind Project will be adopting standard industry practice (JNCC, 2010b) tertiary measures as part of an MMMP, which will be discussed and agreed with consultees post-consent.
- 1.6.5.144 The assessment of potential behavioural disturbance in marine mammals from UXO detonations provided in the Mona Offshore Wind Project ES used various disturbance thresholds including TTS-onset thresholds for high-order detonations, 26 km EDR for high order detonations and 5 km EDR for low order clearance. Behavioural disturbance (using TTS-onset as a proxy) could affect harbour porpoise across the largest ranges of up to 28.23 km (SPL_{pk} metric) and 34.36 km (SEL_{cum} metric), respectively (Table 1.141). Construction is expected from 2026 to 2029 and therefore there may be three years of overlap with Morgan Generation Assets, though the exact dates are uncertain at this stage. Impacts including PTS and disturbance are similar to those identified for Morgan Generation Assets and given the proximity of the two projects, there is potential for in-combination effects to occur with Mona Offshore Wind Project.
- 1.6.5.145 Awel y Môr is located 46.8 km from the Morgan Array Area. The MDS for Awel y Môr anticipated 10 UXOs requiring clearance, with two clearance events every 24 hours but up to 10 detonations in 10 days. The assessed clearance method was high-order detonation, though low-order is more likely. The Environmental Statement assessed both PTS, disturbance as well as TTS as a result of UXO clearance, additional information on the assessment method is detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). The exact mitigation measures contained with the UXO MMMP for Awel y Môr are yet to be determined and agreed with NRW. Residual impacts for PTS from UXO were therefore

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considered unlikely for harbour porpoise and grey seal and minor adverse significance for bottlenose dolphin (RWE, 2022b). In the absence of agreed thresholds to assess the potential for behavioural disturbance in marine mammals from UXO detonations, the Awel y Môr assessment presented results for various disturbance thresholds, including a 26 km EDR for high order detonations, 5 km EDR for low order and TTS-onset thresholds for high-order detonations.

- 1.6.5.146 Awel y Môr used TTS-onset as a proxy for disturbance but caveated this is likely to over-estimate true behavioural response due to UXO comprising a single pulse source sound and not lasting a full diel cycle. Large TTS-onset impact ranges were predicted for harbour porpoise (16 km using SPL_{pk} , Table 1.141). As highlighted in the Awel y Môr Environmental Statement, these ranges may be highly over-precautionary as these do not account for the impulsive sound losing harmful impulsive characteristics and becoming non-impulsive as it propagates from the source (RWE, 2022b). Based on the predicted impact ranges and numbers of animals affected Awel y Môr concluded that the magnitude of the effects of TTS would be low for all species. In the Awel y Môr RIAA, it is reported that the impact range of 16 km would not extend far enough to overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (which is a minimum distance of 21 km from the Awel y Môr array area).
- 1.6.5.147 Project Erebus anticipated one UXO detonation via low-order deflagration but included assessment for high-order detonations for completeness, highlighting this is not realistic. Additional information on the method of assessment and densities used is provided in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). The number of marine mammals expected to experience PTS-onset as a result of UXO detonation for project Erebus is less than one for all species and charge sizes, apart from 0.5 kg and 2 kg NEQ, which could result in PTS in up to two and five harbour porpoise respectively (Table 1.140). For high-order detonation, which is not in the project design for Project Erebus, up to 212 harbour porpoise could be affected by PTS (Blue Gem Wind, 2020), see Table 1.140. The Environmental Statement for Project Erebus used a EDR of 5 km for low order clearance and 26 km for high-order clearance. Additionally, Project Erebus used TTS-onset as a proxy for disturbance, and maximum predicted TTS-onset impact range was 20 km for grey seal (Table 1.141). The Erebus Environmental Statement highlighted that TTS-onset as a proxy for disturbance is expected to over-estimate the actual biological consequences (Blue Gem Wind, 2020). For disturbance from both low-order or high-order UXO detonation, Project Erebus concluded that the impact was unlikely to significantly affect marine mammal receptors (Blue Gem Wind, 2020).
- 1.6.5.148 White Cross Offshore Windfarm is located 319.6 km from the Morgan Array Area. The number of UXO requiring clearance and duration of UXO clearance operations at White Cross Offshore Windfarm was unknown at the time of publication of the Environmental Statement. A UXO Risk Assessment identified different types of UX that may pose a threat to the study site, with a range NEQs (ranging from 0.06 kg to 309.4 kg). The assessed clearance method modelled was high-order detonation (up to 309 kg NEQ) and low-order clearance (2 kg). For injury, with the implementation of an MMMP the significance of effect for all species was considered to be minor adverse for all species for PTS from high-order and low-order detonation (Table 1.140).
- 1.6.5.149 The Environmental Statement for White Cross Offshore Windfarm assessed PTS and TTS/ fleeing response as a proxy for behavioural disturbance, as well as applying a 26 km EDR for harbour porpoise, based on current SNCB guidance (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) for more details). For TTS (and behavioural disturbance), from high-order detonation the significance of effect for harbour porpoise and grey seal was considered

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to be minor adverse, and for HF species was considered to be negligible (Table 1.141). For TTS (and behavioural disturbance) from low-order detonation the significance of effect for harbour porpoise was considered to be minor adverse, and for all other species was considered to be negligible. Large TTS impact ranges were predicted for grey seal at 16 km, with the potential to affect up to 96 individuals, respectively (Table 1.141). For harbour porpoise, for a 20 km disturbance range, up to 1,154 individuals were predicted to potentially be disturbed (Table 1.141). This is based on high-order detonation of the largest UXO size of 309 kg NEQ, whereas the White Cross Offshore Wind Farm Environmental Statement identified that UXO likely to be found in the site would range from 0.06 kg to 309.4 kg.

1.6.5.150 UXO clearance activities coinciding at the respective projects is considered highly unlikely, as due to safety reasons the UXO clearance activities takes place before other construction activities commence. Temporally, sequential UXO clearance at respective projects could lead to a longer duration of impact on marine mammals. Awel y Môr construction dates are from 2026 therefore there may be some overlap in pre-construction activities with Morgan Generation Assets. There is a potential for temporal overlap with UXO clearance activities at Mona Offshore Wind Project. These timelines are, however, indicative and subject to change. UXO clearance at each of these projects will occur as a discrete stage within the overall construction phase and therefore will not coincide continuously over the duration of temporal overlap. Furthermore, each clearance event results in very short duration of sound emission (seconds) (as outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)) event so the impact will be short in temporal duration and therefore the overlap is unlikely. Construction of Project Erebus is likely to be completed a year before the commencement of construction activities at Morgan Generation Assets and therefore will not overlap with associated UXO clearance.

1.6.5.151 The maximum number of animals potentially affected by PTS (harbour porpoise) in the Morgan regional marine mammal study area is 650 animals (Table 1.140). However, as outlined in paragraph 1.6.5.144, this is using modelled high-order UXO clearance for Project Erebus which is very unlikely to occur in practice as the project is seeking consent for one low-order detonation. Therefore, with the implementation of mitigation measures applied at other projects (i.e. use of low order clearance only for Project Erebus, MMMPs for Awel y Môr, Mona Offshore Wind Project and White Cross), the residual risk of injury is likely to be very small.

Table 1.140: Number of animals with the potential to experience PTS during high-order UXO clearance at Tier 1 projects.

Project	Species	Maximum charge size (kg)	Metric	Maximum PTS range (m)	Estimated number within PTS range
Morgan Generation Assets	Harbour porpoise	907	SPL _{pk}	15,370	195
	Bottlenose dolphin			890	<1
	Grey seal		SPL _{pk}	3,015	2
	Harbour seal			3,015	<1
Mona Offshore Wind Project	Harbour porpoise	907	SPL _{pk}	15,370	206
	Bottlenose dolphin			890	<1

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Project	Species	Maximum charge size (kg)	Metric	Maximum PTS range (m)	Estimated number within PTS range
	Grey seal		SPL _{pk}	3,015	6
	Harbour seal			3,015	<1
Awel y Môr Offshore Wind Farm	Harbour porpoise	164	SPL _{pk}	8,600	232
	Bottlenose dolphin			500	<1
	Grey seal		SPL _{pk}	1,600	3
White Cross Offshore Wind Farm	Harbour porpoise	309	SPL _{pk}	11,000	349
	Bottlenose dolphin			610	< 1
	Grey seal			2,000	2
Project Erebus	Harbour porpoise	525	SPL _{pk}	13,000	212
	Bottlenose dolphin			730	<1 (bottlenose dolphin)
	Grey seal		SPL _{pk}	2,500	1

1.6.5.152 Production of underwater sound during UXO clearance from the Tier 1 projects have the potential to cause behavioural disturbance (using TTS-onset as a proxy) in marine mammal receptors in-combination with the Morgan Generation Assets, however, this effect will be short-lived and reversible. The maximum impact ranges and estimated number of Annex II marine mammals estimated in the impact area associated with Tier 1 projects are listed in Table 1.141. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited, even for multiple projects within the Morgan regional marine mammal study area. It is assumed whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance (e.g. cessation of feeding), these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.

Table 1.141: Number of animals with the potential to experience TTS during high-order UXO clearance at Tier 1 projects.

Project	Species	Maximum charge size (kg)	Metric	Maximum range (m)	Estimated number within the range
Morgan Generation Assets	Harbour porpoise	907	SPL _{pk}	28,230	661
	Bottlenose dolphin			1,635	<1
	Grey seal		SEL _{pk}	6,470	6
	Harbour seal		SEL _{pk}	6,470	<1
Mona Offshore Wind Project	Harbour porpoise	907	SPL _{pk}	28,230	245
	Bottlenose dolphin			1,635	<1

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Project	Species	Maximum charge size (kg)	Metric	Maximum range (m)	Estimated number within the range
	Grey seal		SEL _{cum}	6,470	26
	Harbour seal		SEL _{cum}	6,470	<1
Awel y Môr Offshore Wind Farm	Harbour porpoise	164	SPL _{pk}	16,000	804
	Bottlenose dolphin			920	<1
	Grey seal		SPL _{pk}	310	13
White Cross Offshore Wind Farm	Harbour porpoise	309	SPL _{pk}	20,000	1,154
	Bottlenose dolphin			1,100	<1
	Grey seal			16,000	96
Project Erebus	Harbour porpoise	525	SPL _{pk}	23,000	665
	Bottlenose dolphin			1,300	<1 (bottlenose dolphin)
	Grey seal			20,000	52

- 1.6.5.153 As outlined in paragraph 1.6.5.139, the EDR approach, as outlined in JNCC (2020), recommends the use of 26 km deterrence range for UXO. The assessment considered UXO detonation could occur at the closest location within the Morgan Array Area and the other relevant Tier 1 projects to the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.154 As shown in Figure 1.17 the implementation of a 26 km EDR for the Morgan Generation Assets and for the Transmission Assets does not result in any overlap with the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.155 The implementation of a 26 km EDR for Tier 1 Awel y Môr Offshore Wind Farm would result in potential disturbance within 0.24% (based on a footprint of disturbance of 13.26 km²; see Figure 1.17) within the total North Anglesey Marine/Gogledd Môn Forol SAC area of 3,249 km² of the SAC (Awel y Môr Offshore Wind Farm Limited, 2022).
- 1.6.5.156 The implementation of a 26 km EDR for the Tier 1 Mona Offshore Wind Project could result in an overlap of 66.06 km² overlap with the North Anglesey Marine/Gogledd Môn Forol SAC, which corresponds to 2.03% of the SAC (see Figure 1.17).
- 1.6.5.157 Therefore, both Mona Offshore Wind Project and Awel y Môr, using the 26 km EDR approach may result in an overlap with the North Anglesey Marine/Gogledd Môn Forol SAC. Using the EDR approaches available as outlined in paragraph 1.6.5.155 and 1.6.5.156, the maximum disturbance footprints associated with both projects in-combination would result in maximum potential disturbance from Tier 1 projects across an area equating to 2.27% of the total area of the North Anglesey Marine/Gogledd Môn Forol SAC. This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.
- 1.6.5.158 The next closest SAC designated for harbour porpoise is located 64 km away from the Morgan Array Area. Therefore, with the implementation of a 26 km EDR for the Morgan Generation Assets in-combination with the relevant Tier 1 projects, there will be no overlap with the North Channel SAC or any other SACs designated for harbour

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porpoise and disturbance associated with UXO detonation will not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

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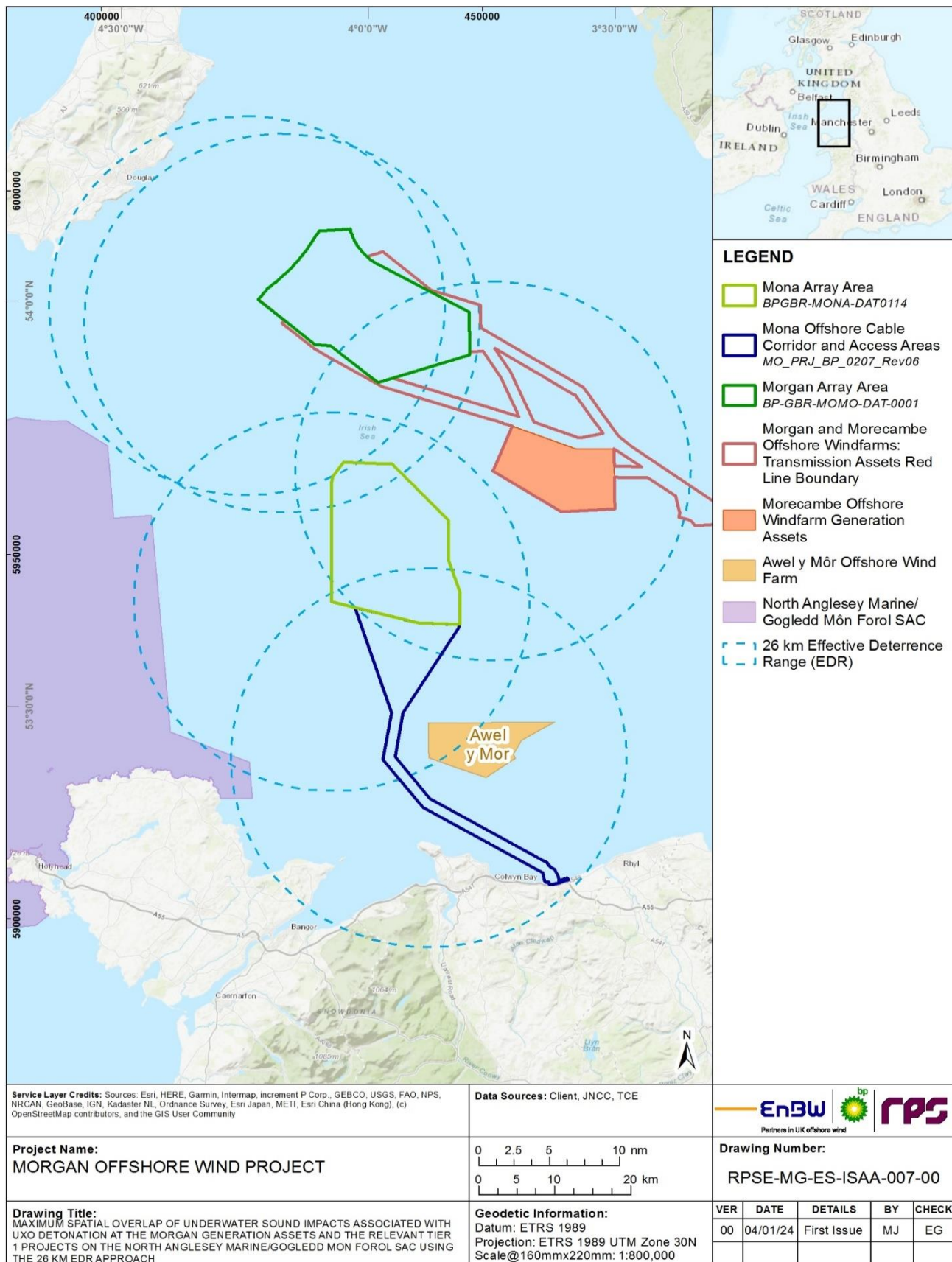


Figure 1.17: Maximum spatial overlap of underwater sound impacts associated with UXO clearance at the Morgan Generation Assets and the relevant Tier 1 projects on the North Anglesey Marine/Gogledd Môn Forol SAC using the 26 km EDR approach.

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Tier 2

- 1.6.5.159 The construction of the Morgan Generation Assets, together with construction phase of the Transmission Assets and Morecambe Generation Assets as well as construction and/or operations and maintenance phases of Tier 2 projects (Inis Ealga Marine Energy Park, LIÿr 1, LIÿr 2, North Channel Wind 1, North Channel Wind 2, Project Valorous, Shelmalere Offshore Wind Farm, Codling Wind Park Offshore Wind Farm, North Celtic Sea Offshore Wind Farm, Project Ilen, Simply Blue Emerald) may lead to injury and disturbance from elevated underwater sound during UXO clearance
- 1.6.5.160 For Tier 2 projects, except Morecambe Generation Assets and Transmission Assets, beyond EIA scoping report there was not enough information to do a quantitative assessment. The EIA Scoping Reports do not provide detailed information about the potential impact of sound from UXO clearance. These projects are likely to have effects similar to the Morgan Generation Assets and will likely have similar measures (e.g. MMMPs or separate marine licences) to avoid injury; but at this stage a more detailed assessment cannot be presented. As stated in paragraph 1.6.5.133 the in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that this would represent duplication. Full assessment of impacts in-combination with Transmission Assets is presented as Scenario 1 in paragraph 1.6.5.135 *et seq* and is not reiterated here.
- 1.6.5.161 The EIA Scoping Report for Shelmalere Offshore Wind Farm (Shelmalere Offshore Wind Farm Ltd., 2022) concluded that a detailed UXO survey would be undertaken post-consent. No further information on UXO clearance method was given. Construction activities are planned from 2028, therefore it is unlikely there will be overlap in UXO clearance with the Morgan Generation Assets. This, in addition to the distance from the Morgan Generation Assets (201.4 km) means minimal spatial overlap in UXO PTS and TTS ranges and limited potential for in-combination effects.
- 1.6.5.162 The LIÿr Projects (LIÿr 1/LIÿr 2) EIA Scoping Report confirms UXO surveys will be undertaken before construction and suggested the potential for UXO clearance will be high due to proximity of the inshore part of the study area to Castlemartin Range (Floventis Energy Ltd., 2022). LIÿr 1 and LIÿr 2 construction period is planned from 2024 to 2025 and therefore it is unlikely there will be overlap in UXO clearance with the Morgan Generation Assets. This, in addition to the distances from the Morgan Generation Assets (298.5 km and 295 km) mean minimal spatial overlap in UXO PTS and TTS ranges, and limited potential for in-combination effects.
- 1.6.5.163 The EIA Scoping Report for Inis Ealga Marine Energy Park proposed that UXO is scoped into the EIA (Inis Ealga Marine Energy Park Ltd., 2022). Construction is planned in 2028, therefore it is unlikely there will be overlap in UXO clearance with the Morgan Generation Assets as it will be carried out after Morgan Generation Assets construction period. This, in addition to the distance from the Morgan Generation Assets (327 km) means likely minimal spatial overlap in UXO PTS and TTS ranges and limited potential for in-combination effects.
- 1.6.5.164 Codling Wind Park does not explicitly scope in or out sound from UXO clearance but does mention it will consider a MMMP for any potential UXO work (Codling Wind Park Limited, 2020). The construction phase is planned to be complete by 2027 and therefore some temporal overlap with Morgan Generation Assets construction is possible. Despite the lack of information, the smaller proposed extent (less UXOs within the area) and location on the east of Ireland (141.2 km from Morgan Generation Assets) means there is limited potential for in-combination effects with Codling Wind Park.

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- 1.6.5.165 The North Celtic Sea Offshore Wind Farm EIA Scoping Report assumes that UXO clearance may result in injury and/or disturbance to marine mammals from elevated underwater sound (North Celtic Sea Wind Limited, 2023). However, the timeline for the construction phase of the North Celtic Sea Offshore Wind Farm is unknown and therefore the temporal overlap with the Morgan Generation Assets UXO clearance is not possible to assess. However, given that the North Celtic Sea Offshore Wind Farm will be located approximately 277 km from the Morgan Generation Assets, the spatial overlap of sound contours and therefore in-combination impacts are unlikely.
- 1.6.5.166 Injury and disturbance due to UXO clearance has also been scoped in for further consideration as a potential impact to marine mammals in North Channel Wind 1 and 2 Projects EIA Scoping Report (North Channel Wind Limited, 2023). The use of low order clearance techniques (deflagration) was acknowledged as preferred approach and the project committed to appropriate mitigation measures, (e.g. ADDs and soft starts) (North Channel Wind Limited, 2023). The construction of North Channel Wind 1 and 2 Projects is planned to take place in 2029 and since the UXO clearance usually takes place at the beginning of its construction phase (commencing in 2026 at Morgan Generation Assets), the temporal overlap and therefore in-combination impacts are unlikely.
- 1.6.5.167 The Project Ilen EIA Scoping Report identified that underwater sound due to clearance of UXO may have detrimental effects on marine mammals, including physical or auditory injury as well as short-term behavioural effects (Western Star Wind Ltd, 2023). The use of low order clearance techniques (deflagration) was acknowledged as preferred approach and the project committed to appropriate mitigation measures, e.g. ADDs and soft starts. However, as for Simply Blue Emerald, the timeline for the construction phase of the Project Ilen is unknown and therefore the temporal overlap with the Morgan Generation Assets UXO clearance is not possible to assess. However, considering that the Project Ilen will be located to the west of Ireland and approximately 393.7 km from the Morgan Generation Assets, the spatial overlap of sound contours and therefore in-combination impacts are unlikely.
- 1.6.5.168 The Project Valorous EIA Scoping Report assumes that given the proximity to the Castlemartin firing range, there is potential for UXOs to be present in the area and that their controlled detonation can cause injury to marine mammals (Blue Gem Wind, 2020). Though it is not certain that UXOs will be discovered at the scoping stage, the impact has been scoped in due to its potential severity (Blue Gen Wind, 2020). It has been acknowledged that Project Valorous would follow best practice measures to limit the impacts of sound on sensitive receptors, such as adhering to the JNCC's guidelines on mitigation measures for UXO detonation (JNCC, 2010b). The construction of Project Valorous is planned to take place in 2029 and since the UXO clearance usually takes place at the beginning of its construction phase (commencing in 2026 at Morgan Offshore Wind Project), the temporal overlap and therefore in-combination impacts are unlikely.
- 1.6.5.169 The Simply Blue Emerald EIA Scoping Report assumes that if UXO clearance will be required, disposal could be a significant sound source depending on the selected disposal methods and this impact has been scoped in for further consideration in the EIA process (Emerald Floating Wind, 2023). The EIA Scoping Reports anticipated that a number of mitigation measures could possibly be used, including methods to reduce underwater sound from the project, such as the use of low order detonation methods for UXO disposal. Nevertheless, the timeline for the construction phase of the Simply Blue Emerald project is unknown and therefore the temporal overlap with the Morgan Generation Assets UXO clearance is not possible to assess. However, considering that the Simply Blue Emerald will be located approximately 359.2 km from the Morgan

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Generation Assets, the spatial overlap of sound contours and therefore in-combination impacts are unlikely.

- 1.6.5.170 On the basis of information available at the time of writing, there are no Tier 2 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on marine mammals due to UXO clearance.
- 1.6.5.171 Adopting a precautionary approach, and assuming application of standard industry measures (such as MMOs, PAM and ADDs) measures, the assessment considered the impact for a high order detonation.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

- 1.6.5.172 There is potential for injury and/or disturbance (presented as TTS/moving away response) from elevated underwater sound from UXO clearance on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of activities associated with the Morgan Generation Assets during construction, in-combination with activities associated with other projects/plans.
- 1.6.5.173 As outlined in paragraph 1.6.5.132, behavioural effects are therefore considered to be negligible in this context. TTS is presented as a temporary auditory injury but also represents a threshold for the onset of the moving away response in line with recommendation from Southall *et al.* (2007).
- 1.6.5.174 For Scenario 1 (see paragraphs 1.6.5.135 to 1.6.5.138 and Volume 2 Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)), during high order UXO clearance at Morgan Generation Assets and Transmission Assets, there is a potential injury range of 15,370 m for harbour porpoise, which with the implementation of primary measures is reduced to a residual risk of injury over the range of 2,290 m. Behavioural disturbance (using TTS-onset as a proxy) could affect harbour porpoise across largest range of up to 28 km. In addition, the risk of injury and disturbance is expected to be further reduced with the implementation of tertiary measures, including a MMMP. The in-combination impact resulting from high order detonation is predicted to be of regional spatial extent, short term duration and behavioural effects are considered reversible. Therefore, although there may be a residual risk of PTS to a small number of individuals, these impacts when considered in the context of the conservation objectives of the SAC for the harbour porpoise feature, are not expected to be significant (see Table 1.142).
- 1.6.5.175 For Scenario 3 (see paragraphs 1.6.5.141 to 1.6.5.152) UXO clearance coinciding at Tier 1 projects was considered highly unlikely, as due to safety reasons the UXO clearance activities takes place before other construction activities commence. In addition, UXO clearance at each of these projects will not coincide continuously over the duration of temporal overlap. Furthermore, each clearance event results in very short duration of sound emission (seconds) event so the impact will be short in temporal duration and therefore the overlap is unlikely. The maximum number of harbour porpoise potentially affected by PTS during high order UXO clearance was 650 animals. However, this modelled number of animals is highly unlikely to occur in practice (see paragraph 1.6.5.151). Therefore, with the implementation of mitigation measures applied at other projects (i.e. use of low order clearance only for Project Erebus, MMMPs for Awel y Môr, Mona Offshore Wind Project and White Cross), the residual risk of injury from Tier 1 projects is likely to be very small. The elevation of underwater sound during UXO clearance from the Tier 1 projects have the potential to cause behavioural disturbance (using TTS-onset as a proxy) in harbour porpoise in-

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combination with the Morgan Generation Assets, however, this effect will be short-lived and reversible. It is assumed whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance from the Morgan Generation Assets in-combination with Tier 1 projects (e.g. cessation of feeding), these are reversible on recovery of harbour porpoise hearing and therefore not considered likely to lead to any long-term effects on the individual.

- 1.6.5.176 The construction of the Morgan Generation Assets, together with the construction of Tier 2 projects (considered as part of Scenario 3, see paragraphs 1.6.5.159 to 1.6.5.171) could lead to injury and disturbance of harbour porpoise from underwater sound generation from UXO clearance. These projects are likely to have effects similar to the Morgan Generation Assets and will likely have similar measures (e.g. MMMPs or separate marine licences) to avoid injury; but at this stage a more detailed assessment cannot be presented, due to limited available information at the time of writing. On the basis of information available at the time of writing, there are no Tier 2 projects (except Transmission Assets and Morecambe Generation Assets which are considered in Scenario 1) that could contribute to a in-combination effect on harbour porpoise due to UXO clearance. Therefore, the conclusions on the conservation objectives of the SAC are likely to be the same as for the assessment of Tier 1 projects presented above (see Table 1.142).

Conclusions

- 1.6.5.177 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.142.

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Table 1.142: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination elevated underwater sound during UXO clearance during the construction phase

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p>	<p>As shown in Table 1.139, the maximum injury range for harbour porpoise from a high order UXO clearance was 15,370 m, which yields an estimated 416 animals within the impact area. The behavioural range for the Morgan Generation Assets In-combination with the Transmission Assets was found to be approximately 28 km, which yields an estimated 1,411 animals within the impact area.</p> <p>However, assuming standard industry measures (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56, including MMOs, PAM and ADDs) are applied for both projects, it is anticipated that harbour porpoise would be deterred from the injury zone (predicted to be 2,290 m following the application of primary measures) and therefore the risk of PTS would be low. This range, and potential risk of injury to harbour porpoise will be further reduced with the application of tertiary measures adopted for both projects as part of a MMMP (Document Reference J17), which will be agreed with consultees post-consent. Therefore, it is anticipated that most individuals will be deterred from the injury zone and the risk of PTS is reduced. Whilst some ecological functions could be inhibited in the short-term due to large TTS ranges, these are reversible on recovery of the animals hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.</p>	<p>As described in paragraphs 1.6.5.175 and 1.6.5.176, the maximum number of harbour porpoise potentially affected by PTS during high order UXO clearance of the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects was 650 animals. In addition, the potential for behavioural disturbance on harbour porpoise from the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects was assessed to be unlikely to be significant, given that the effects would be short-lived and reversible.</p> <p>In addition, assuming standard industry measures (e.g. the measures adopted as part of the Morgan Generation Assets, the use of low order clearance only for Project Erebus, MMMPs for Awel y Môr, Mona Offshore Wind Project and White Cross) are applied for each relevant project considered under Scenario 3, the residual risk of injury to harbour porpoise is likely to be very small.</p> <p>For Tier 2 projects, there was limited available information to assess the impact of elevated underwater sound during UXO clearance on harbour porpoise. However, the effects resulting from these projects are likely to be similar to the Morgan Generation Assets. Therefore, on the basis of the information available at the time of writing, there are no Tier 2 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on harbour porpoise due to UXO clearance.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>There is no significant disturbance of the species</p>	<p>As described in paragraph 1.6.5.132, the duration of effect for each UXO detonation is less than one second. As such, behavioural effects are considered negligible in this context. TTS is presented as a temporary auditory injury but also represents a threshold for the onset of the moving away response in line with recommendation from Southall <i>et al.</i> (2007). The total number of harbour porpoise estimated to be within the impact area (approximately 28 km) during high order UXO clearance was 1,411. However, assuming the application of standard industry measures (such as MMOs, PAM and ADDs) and the implementation of a MMMP, as agreed with consultees, are applied for both the Morgan Generation Assets and the Transmission Assets this impact is predicted to be reduced. In addition, the in-combination impacts are expected to be of regional spatial extent, short-term duration, intermittent and both the impact itself (i.e. elevated underwater sound during the detonation event only) and effect of behavioural disturbance is reversible.</p> <p>As a result, the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets In-combination with the Transmission Assets is not expected to surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance of the Morgan Generation Assets in-combination with the Transmission Assets is unlikely to be significant. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb harbour porpoise.</p>	<p>will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.</p> <p>A described in paragraphs 1.6.5.175 and 11.6.5.176, the potential for behavioural disturbance of harbour porpoise resulting from the Morgan Generation Assets In-combination with the projects assessed under Scenario 3 are not likely to be significant.</p> <p>Since elevated underwater sound due to UXO clearance is predicted to be of regional spatial extent, short-term duration, intermittent and both the impact itself (i.e. elevated underwater sound during the detonation event only) and the effect of behavioural disturbance is reversible, the potential for significant behavioural disturbance is considered unlikely for the Morgan Generation Assets In-combination with the projects considered under Scenario 3. It is assumed that whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance from the Morgan Generation Assets in-combination with Tier 1 projects (e.g. cessation of feeding), these are reversible on recovery of harbour porpoise hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>The effects of elevated underwater sound generation from UXO clearance for the Morgan Generation Assets in-combination with Tier 2 projects are likely to be similar to the assessment of Tier 1 projects presented above (although of note, this is based on the limited available information at the time of writing).</p> <p>There is limited/no information on the construction/operation dates or whether UXO clearance will be considered in respective EIA assessments for Tier 3 projects. Although temporal and/or spatial overlap with Tier 3 projects cannot be discounted, at current time it is not possible to undertake any kind of meaningful assessment. As such the conclusions for Tier 1, Tier 2 and Tier 3 projects combined is</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
		<p>concluded to be no different than for Tier 1 and Tier 2 projects combined.</p> <p>As a result, the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets in-combination with Tier 1, Tier 2 and Tier 3 projects is not expected to surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance in-combination with other projects is unlikely to be significant. Underwater sound from UXO detonation associated with the Morgan Generation Assets in-combination with other projects will not significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from UXO clearance from the Morgan Generation Assets in-combination with the Transmission Assets to result in adverse effects on the habitats of harbour porpoise (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the Transmission Assets, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. (see paragraph 1.6.4.470)</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from UXO clearance from the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects to result in adverse effects on the habitats of harbour porpoise (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with other plans and projects considered under Scenario 3, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. (see paragraph 1.6.4.470)</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>

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1.6.5.178 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.6.5.179 The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC assessed in paragraphs 1.6.5.132 to 1.6.5.176. As The North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.180 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.143.

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Table 1.143: Conclusions against the conservation objectives of the North Channel SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p>	<p>Assuming standard industry measures (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56, including MMOs, PAM and ADDs) are applied for the Morgan Generation Assets and the Transmission Assets, it is anticipated that harbour porpoise would be deterred from the injury zone (predicted to be 2,290 m following the application of primary measures) and therefore the risk of PTS from In-combination elevated underwater sound during UXO clearance would be low. This range, and potential risk of injury to harbour porpoise will be further reduced with the application of tertiary measures adopted for both projects as part of a MMMP (Document Reference J17), which will be agreed with consultees post-consent. Therefore, it is anticipated that most individuals will be deterred from the injury zone and the risk of PTS is reduced. Whilst some ecological functions could be inhibited in the short-term due to large TTS ranges, these are reversible on recovery of the animals hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the</p>	<p>Assuming standard industry measures (e.g. the measures adopted a part of the Morgan Generation Assets, the use of low order clearance only for Project Erebus, MMMPs for Awel y Môr, Mona Offshore Wind Project and White Cross) are applied for each relevant project considered under Scenario 3, the residual risk of injury to harbour porpoise is likely to be very small. In addition, it is considered that there are no Tier 2 projects or Tier 3 (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on harbour porpoise due to UXO clearance (see Table 1.142).</p> <p>The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.</p>	
<p>There is no significant disturbance of the species</p>	<p>As described in Table 1.142 for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC, the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets In-combination with the Transmission Assets is not expected to surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance from the Morgan Generation Assets In-combination with the Transmission Assets was concluded as unlikely to be significant.</p> <p>Given that the North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb harbour porpoise.</p>	<p>As described in Table 1.142 for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC, the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects is not expected to surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance in-combination with other projects is unlikely to be significant.</p> <p>Given that the North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from UXO clearance from the Morgan Generation Assets In-combination with the Transmission Assets to result in adverse effects on the habitats of harbour porpoise (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the Transmission Assets, effects are not considered to be significant or long-term ensuring that the project will not</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from UXO clearance from the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects to result in adverse effects on the habitats of harbour porpoise (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with other plans and projects considered under Scenario 3, effects are not</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, underwater sound from UXO detonation associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. (see paragraph 1.6.4.470). Therefore, underwater sound from UXO detonation associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>

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1.6.5.181 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.6.5.182 For Scenario 1 (see Table 1.139) during high order UXO clearance at the Transmission Assets and Morgan Generation Assets, less than one harbour seal was estimated to be within the impact area for injury or behavioural disturbance. Therefore, effects from this impact on the harbour seal feature of this SAC were considered unlikely.

1.6.5.183 For Scenario 3, the assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross did not consider effects on harbour seal, as this was not included as a key species in these assessments. Therefore, harbour seal has not been considered further in this in-combination effects section for the aforementioned projects. Table 1.137 presents the estimated number of harbour seal with potential to experience PTS during high-order UXO clearance at relevant Tier 1 projects. For each project considered, it was estimated that there would be less than one individual within the PTS range. Furthermore, less than one individual harbour seal was estimated within the range to experience TTS during high-order UXO clearance at Tier 1 projects (see Table 1.138).

1.6.5.184 It was also concluded under Scenario 3 that on the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are considered under Scenario 1) that could contribute to an in-combination effect on harbour seal due to UXO clearance.

1.6.5.185 Furthermore, harbour seal has a large foraging range (up to 273 km reported in Carter *et al.* (2022)) and could therefore move to alternative foraging grounds during piling associated with the Morgan Generation Assets and other projects considered in the in-combination assessment (for both Scenario 1 and Scenario 3).

1.6.5.186 Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects considered under Scenario 1 and Scenario 3. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Morgan Generation Assets, Mona Offshore Wind Project and Awel y Môr in 2028.

1.6.5.187 There may be the potential for in-combination effects on harbour seal with the Morgan Generation Assets In-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects. However, assuming standard industry measures applied for each project, it is anticipated that most animals would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst the implementation of standard industry mitigation measures for each project, this potential impact is considered to be short-term with and full recovery of the animal's hearing is anticipated therefore no long-term effects on the individual are not expected to occur.

1.6.5.188 Although information was not available for this project to inform a quantitative assessment for all the projects considered under Scenario 3, it is considered that standard industry measures (such as a MMOs/PAM and ADDs) measures will also be employed for these projects which will reduce the risk of injury to harbour seal.

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Conclusions

- 1.6.5.189 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraph 1.6.2.19) are discussed in Table 1.96. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.144: Conclusions against the conservation objectives of the Strangford Lough SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>As outlined in paragraphs 1.6.5.182 to 1.6.5.188, less than one harbour seal was estimated to be within the impact area for injury or for behavioural disturbance from elevated underwater sound from high order UXO detonation from the Morgan Generation Assets In-combination with the Transmission Assets.</p> <p>In addition, with the implementation of standard industry mitigation measures such as those outlined for the Morgan Generation Assets (Table 1.56) for both projects, it is anticipated that mitigation such as ADDs will deter animals from the injury zone and therefore the risk of PTS would be low for both projects when considered in-combination. Whilst the implementation of mitigation such as ADDs may exacerbate the number of animals at risk of TTS, this potential impact is considered to be short-term and with full recovery of the animal's hearing is anticipated therefore no long-term effects on the individual are expected to occur.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored at favourable condition. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As outlined in paragraphs 1.6.5.182 to 1.6.5.188, harbour seal was not considered in the in-combination effects section for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross. In addition, for the remaining Tier 1 projects considered under Scenario 3, it was estimated that there would be less than one individual within the PTS range. Furthermore, less than one individual harbour seal was estimated within the range to experience TTS during high-order UXO clearance at Tier 1 projects. On the basis of information available at the time of writing, there are also no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to a in-combination effect on harbour seal due to UXO clearance.</p> <p>In addition, with the implementation of standard industry mitigation measures such as those outlined for the Morgan Generation Assets (Table 1.56) for all projects considered under Scenario 3, it is anticipated that mitigation such as ADDs will deter animals from the injury zone and therefore the risk of PTS would be low for both projects considered. Whilst the implementation of mitigation such as ADDs may exacerbate the number of animals at risk of TTS, this potential impact is considered to be short-term and full recovery of the animal's hearing is anticipated therefore no long-term effects on the individual are expected to occur.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not prevent the harbour seal feature from being maintained or restored at favourable condition. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		combination with the projects considered under Scenario 3 will not prevent the population of harbour seal from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site	There is no pathway for underwater sound in-combination effects from UXO clearance associated with Morgan Generation Assets in-combination with the Transmission Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound associated with UXO clearance) to result in adverse effects on the physical features used by the harbour seal features within the site. Therefore, there is no potential for In-combination effects.	There is no pathway for underwater sound in-combination effects from UXO clearance associated with Morgan Generation Assets in-combination with the other projects considered under Scenario 3 (i.e. there will be no habitat loss/disturbance from elevated underwater sound associated with UXO clearance) to result in adverse effects on the physical features used by the harbour seal features within the site. Therefore, there is no potential for In-combination effects.

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1.6.5.190 Therefore, it can be concluded beyond reasonable scientific doubt, that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.6.5.191 The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC (94.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.182 to 1.6.5.190. As the Murlough SAC is located at an increased distance from the Morgan Generations Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.192 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraph 1.6.2.24) are discussed in Table 1.145. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.145: Conclusions against the conservation objectives of the Murlough SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>As described in Table 1.144 for the Strangford Lough SAC , with the implementation of standard industry mitigation measures such as those outlined for the Morgan Generation Assets (Table 1.56) for both projects, it is anticipated that mitigation such as ADDs will deter animals from the injury zone and therefore the risk of PTS would be low for the impacts from the Morgan Generation Assets In-combination with the Transmission Assets. The risk of TTS from this impact is also considered to be short-term with and full recovery of the animal’s hearing is anticipated therefore no long-term effects on the individual are expected to occur.</p> <p>Given that the Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC, it is considered that effects from this impact would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored at favourable condition. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Asset will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As described in Table 1.144 for the Strangford Lough SAC, with the implementation of standard industry mitigation measures such as those outlined for the Morgan Generation Assets (Table 1.56) for all projects considered under Scenario 3, it is anticipated that mitigation such as ADDs will deter animals from the injury zone and therefore the risk of PTS would be low for both projects considered. The risk of TTS from this impact for the projects considered under Scenario 3 is also considered to be short-term with and full recovery of the animal’s hearing is anticipated therefore no long-term effects on the individuals are expected to occur.</p> <p>Of note, under the assessment for Scenario 3, it was determined that there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are considered under Scenario 1) that could contribute to an in-combination effect on harbour seal due to UXO clearance.</p> <p>Given that the Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC, it is considered that effects from this impact would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not prevent the harbour seal feature from being maintained or restored at favourable condition. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the projects considered under Scenario 3</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
Maintain and enhance, as appropriate, physical features used by harbour seal within the site	<p>There is no pathway for underwater sound in-combination effects from UXO detonation associated with Morgan Generation Assets in-combination with the Transmission Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance) to result in adverse effects on the physical features used by the harbour seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>will not prevent the population of harbour seal from being maintained or enhanced.</p> <p>There is no pathway for underwater sound in-combination effects from UXO detonation associated with Morgan Generation Assets in-combination with other projects considered under Scenario 3 (i.e. there will be no habitat loss/disturbance from elevated underwater sound associated with UXO clearance) to result in adverse effects on the physical features used by the harbour seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>

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- 1.6.5.193 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC

Bottlenose dolphin and grey seal

- 1.6.5.194 For Scenario 1 (see Table 1.139) during high order UXO clearance at the Transmission Assets and Morgan Generation Assets, less than one bottlenose dolphin and four grey seal were estimated to be within the impact area for injury (PTS). For behavioural disturbance, less than one bottlenose dolphin and 11 grey seal were estimated to be within the impact area. Therefore, assuming the application of standard injury measures are applied for the Morgan Generation Assets and the Transmission Assets, the potential for injury from these two projects in-combination on the bottlenose dolphin and grey seal features of this SAC is unlikely to be significant. The potential for disturbance to these features is also considered unlikely to be significant as the impact is predicted to be of regional spatial extent, short-term duration, intermittent and both the impact itself (i.e. elevated underwater sound during the detonation event only) and effect of behavioural disturbance is reversible.
- 1.6.5.195 For Scenario 3, the estimated number of bottlenose dolphin with potential to experience PTS or TTS during high-order UXO clearance at Tier 1 projects was less than one individual for all Tier 1 projects considered in the assessment. For grey seal, the total estimated number with potential to experience PTS from all Tier 1 projects was 14 grey seal. The total number of grey seal with the potential to experience TTS during high-order UXO clearance at Tier 1 projects was 188 individuals. Therefore, elevated underwater sound during UXO clearance from the Tier 1 projects has the potential to cause behavioural disturbance (using TTS-onset as a proxy) in Annex II marine mammal features of this SAC in-combination with the Morgan Generation Assets. However, this effect will be short-lived and reversible, and reduced through the implementation of standard industry measures for each project. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited; therefore, long-term effects on either feature of the SAC are considered unlikely.
- 1.6.5.196 On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on marine mammals due to elevated underwater sound during UXO clearance.

Conclusions

- 1.6.5.197 It is concluded that no adverse effects on the qualifying bottlenose dolphin and grey seal features which undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC will occur as a result of elevated underwater sound during UXO clearance during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.34 to 1.6.2.36) are discussed in Table 1.146.

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Table 1.146: Conclusions against the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p>	<p>As described in paragraphs 1.6.5.194 to 1.6.5.196, during high order UXO clearance at the Transmission Assets and the Morgan Generation Assets, less than one bottlenose dolphin and four grey seal was estimated to be within the impact area for injury. For behavioural disturbance, less than one bottlenose dolphin and 11 grey seal were estimated to be within the impact area.</p> <p>Assuming standard industry measures are applied for both projects (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that bottlenose dolphin and grey seal would be deterred from the injury zone and therefore the risk of PTS from the Morgan Generation Assets In-combination with the Transmission Assets would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of bottlenose dolphin or grey seal features using the SAC and bottlenose dolphin and grey seal will remain a viable component of their natural habitats.</p>	<p>As described in paragraphs 1.6.5.194 to 1.6.5.196, for bottlenose dolphin during high order UXO clearance at the Morgan Generation Assets In-combination with all relevant Tier 1 projects, less than one individual was estimated to be able to experience PTS or TTS. For grey seal, the total estimated number with potential to experience PTS from all Tier 1 projects was 14 grey seal. The total number of grey seal with the potential to experience TTS during high-order UXO clearance at Tier 1 projects was 188 individuals.</p> <p>Assuming standard industry measures are applied to all Tier 1 projects considered under Scenario 3 (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that the effects will be short-lived and reversible. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impacts from the Morgan Generation Assets In-combination with the relevant Tier 1 projects is considered to be very limited, long-term effects on either feature of the SAC are considered unlikely.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are considered under Scenario 1) that could contribute to a in-combination effect on marine mammals due to UXO clearance.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not affect the survivability and reproductive potential of bottlenose dolphin or grey seal features using the SAC and</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
		<p>bottlenose dolphin and grey seal will remain a viable component of their natural habitats.</p>
<p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The maximum range for grey seal to experience onset PTS during high order UXO clearance at the Transmission Assets and the Morgan Generation Assets is 3,015 m and the range for disturbance effects is 6,470 m. For bottlenose dolphin the maximum range to experience onset of PTS during high order UXO clearance at the Transmission Assets and the Morgan Generation Assets is 890 m and the range for disturbance is 1,635 m.</p> <p>Given the distance of Morgan Generation Assets from the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km), the PTS and/or TTS ranges of the potential impact associated with the Morgan Generation Assets is unlikely to extend to the SAC.</p> <p>The Morgan Generation Assets will, therefore, not contribute to an in-combination impact for Scenario 1. Therefore, the populations of bottlenose dolphin and grey seal within the site are such that the natural ranges of the populations are not being reduced or likely to be reduced for the foreseeable future as a result of the Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>The maximum ranges for grey seal and bottlenose dolphin to experience onset PTS during high-order UXO clearance at Tier 1 projects is shown in Table 1.140. For both the Morgan Generation Assets and the Mona Offshore Wind Project, the PTS ranges for bottlenose dolphin to experience PTS during high order UXO clearance were 890 m. For grey seal these values were 3,015 m for both projects. For TTS, the maximum range for animals to experience TTS during high-order UXO clearance at Tier 1 projects was 1,635 for bottlenose dolphin and 6,470 for grey seal for the Morgan Generation Assets and the Mona Offshore Wind Project.</p> <p>For all of the remaining Tier 1 projects assessed under Scenario 3, these PTS and TTS ranges were less than for the above described projects.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are assessed under Scenario 1) that could contribute to a in-combination effect on marine mammals due to UXO clearance.</p> <p>Given the distance of the Morgan Generation Assets from the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km), the PTS and/or TTS ranges of the potential impact associated with the Morgan Generation Assets in-</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		<p>combination with the projects considered under Scenario 3 is unlikely to extend to the SAC.</p> <p>The Morgan Generation Assets will, therefore, not contribute to an in-combination impact for Scenario 3. Therefore, the populations of bottlenose dolphin and grey seal within the site are such that the natural ranges of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Morgan Generation Assets in-combination with the Transmission Assets and relevant Tier 1, Tier 2 and Tier 3 projects.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for elevated underwater sound in-combination effects from UXO clearance from the Morgan Generation Assets and the Transmission Assets to result in adverse effects on the habitats of bottlenose dolphin and grey seal (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the Transmission Assets (see Volume 2 Chapter 3: Fish and shellfish ecology of the Environmental Statement), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p> <p>Therefore, there is no potential for in-combination effects.</p>	<p>There is no pathway for elevated underwater sound in-combination effects from UXO clearance from the Morgan Generation Assets and the other projects considered under Scenario 3 to result in adverse effects on the habitats of bottlenose dolphin and grey seal (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with Scenario 3 projects (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance from UXO detonation associated with the Morgan Generation Assets in-combination with other plans and projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p> <p>Therefore, there is no potential for In-combination effects.</p>

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1.6.5.198 Therefore, it can be concluded beyond reasonable scientific doubt, that there **is no risk of an adverse effect on the integrity** of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.6.5.199 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.197 to 1.6.5.198. As The Maidens SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.200 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.4.56 to 1.6.4.67) are discussed in Table 1.147. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.147: Conclusions against the conservation objectives of The Maidens SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for both the Morgan Generation Assets and the Transmission Assets (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that grey seal would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Given that The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not inhibit the maintenance (or restoration where appropriate) of the grey seal feature of this SAC. Similarly, these impacts will not significantly impact the population or distribution of grey seal at this SAC.</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied all relevant Tier 1 projects (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that the effects of this impact from the Morgan Generation Assets In-combination with the relevant Tier 1 projects will be short-lived and reversible. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited, long-term effects on the grey seal feature of the SAC are considered unlikely.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are considered under Scenario 1) that could contribute to a in-combination effect on grey seal due to UXO clearance.</p> <p>Given that The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142.0 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not inhibit the maintenance (or restoration where appropriate) of the grey seal feature of this SAC. Similarly these impacts will not significantly impact the population or distribution of grey seal at this SAC.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from UXO detonation associated with Morgan Generation Assets in-combination with the Transmission Assets (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance) to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>	<p>There is no pathway for underwater sound in-combination effects from UXO detonation associated with Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance) to result in adverse effects on the physical features used by the grey seal features within the site.</p> <p>Therefore, there is no potential for In-combination effects.</p>

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1.6.5.201 Therefore, it can be concluded that there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.5.202 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.197 to 1.6.5.198. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generations Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Grey seal

1.6.5.203 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.5.220.

Conclusions

1.6.5.204 It is concluded that no adverse effects on the qualifying bottlenose dolphin features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.61 to 1.6.2.65) are discussed in Table 1.148

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Table 1.148: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for both the Morgan Generation Assets and the Transmission Assets (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that bottlenose dolphin would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Given that the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of bottlenose dolphin using the SAC and bottlenose dolphin will remain a viable component of their natural habitats.</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied all considered Tier 1 projects (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that the effects will be short-lived and reversible. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impacts from the Morgan Generation Assets In-combination with the Transmission Assets and other relevant Tier 1 projects t is considered to be very limited, long-term effects on the bottlenose dolphin feature of the SAC are considered unlikely.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except the Transmission Assets and Morecambe Generation Assets, which are assessed under Scenario 1) that could contribute to an in-combination effect on bottlenose dolphin due to UXO clearance.</p> <p>Given that the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not inhibit the maintenance (or restoration where appropriate) of the bottlenose dolphin feature of this SAC. Similarly, these impacts will not</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, the PTS and/or TTS ranges of the potential impact associated with the Morgan Generation Assets is unlikely to extend to the SAC. The Morgan Generation Assets will, therefore, not contribute to an in-combination impact with the Transmission Assets.</p> <p>Given that the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the N Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, the population of bottlenose dolphin within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>significantly impact the population or distribution of bottlenose dolphin at this SAC.</p> <p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, the PTS and/or TTS ranges of the potential impact associated with the Morgan Generation Assets is unlikely to extend to the SAC (see PTS and TTS ranges for Tier 1 projects in Table 1.140). The Morgan Generation Assets will, therefore, not contribute to an in-combination impact with any of the projects considered under Scenario 3.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on bottlenose dolphin due to UXO clearance.</p> <p>Given that the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the N Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>The Morgan Generation Assets will, therefore, not contribute to an in-combination impact for Scenario 3. Therefore, the populations of bottlenose dolphin within the site are such that the natural ranges of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the</p>	<p>There is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of bottlenose dolphin (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species,</p>	<p>There is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of bottlenose dolphin (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species,</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>species within the site and population beyond the site is stable or increasing</p>	<p>although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the Transmission Assets, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of bottlenose dolphin.</p>	<p>although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the projects considered under Scenario 3, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of bottlenose dolphin.</p>

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- 1.6.5.205 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during UXO clearance with respect to the Morgan Generations Assets in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

- 1.6.5.206 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.197 to 1.6.5.198. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.207 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.71 to 1.6.2.74) are discussed in Table 1.149.

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Table 1.149: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for both the Morgan Generation Assets and the Transmission Assets (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that grey seal would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Given that the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of bottlenose dolphin using the SAC and grey seal will remain a viable component of their natural habitats.</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for all considered Tier 1 projects (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that the effects will be short-lived and reversible. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited, long-term effects on the grey seal feature of the SAC are considered unlikely.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are considered under Scenario 1) that could contribute to an in-combination effect on grey seal due to UXO clearance.</p> <p>Given that the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not inhibit the maintenance (or restoration where appropriate) of the grey seal feature of this SAC. Similarly, these impacts will not significantly impact the population or distribution of grey seal at this SAC.</p>

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<p>Conservation Objective</p>	<p>Scenario 1 Morgan Generation Assets + Transmission Assets</p>	<p>Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects</p>
<p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, the PTS and/or TTS ranges of the potential impact associated with the Morgan Generation Assets is unlikely to extend to the SAC. The Morgan Generation Assets will, therefore, not contribute to an in-combination impact with the Transmission Assets.</p> <p>Given that the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, the population of grey seal within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Morgan Generation Assets in-combination with the Transmission Assets.</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, the PTS and/or TTS ranges of the potential impact associated with the Morgan Generation Assets is unlikely to extend to the SAC (see PTS and TTS ranges for Tier 1 projects in Table 1.140). The Morgan Generation Assets will, therefore, not contribute to an in-combination impact with any of the projects considered under Scenario 3.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on grey seal due to UXO clearance.</p> <p>Given that the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>The Morgan Generation Assets will, therefore, not contribute to an in-combination impact for Scenario 3. Therefore, the populations of grey seal within the site are such that the natural ranges of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the Transmission Assets, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of grey seal.</p>	<p>There is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the projects considered under Scenario 3, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of grey seal.</p>

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- 1.6.5.208 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

- 1.6.5.209 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC assessed in paragraphs 1.6.5.132 to 1.6.5.176. As The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.210 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.79 to 1.6.2.80) are discussed in Table 1.150.

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Table 1.150: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p>	<p>Assuming standard industry measures (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56, including MMOs, PAM and ADDs) are applied for both the Morgan Generation Assets and the Transmission Assets, it is anticipated that for harbour porpoise would be deterred from the injury zone (predicted to be 2,290 m following the application of primary measures) and therefore the risk of PTS would be low. This range, and potential risk of injury to harbour porpoise will be further reduced with the application of tertiary measures adopted for both projects as part of a MMMP (Document Reference J17), which will be agreed with consultees post-consent. Therefore, it is anticipated that most individuals will be deterred from the injury zone and the risk of PTS is reduced. Whilst some ecological functions could be inhibited in the short-term due to large TTS ranges, these are reversible on recovery of the animals hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the</p>	<p>Assuming standard industry measures (e.g. the measures adopted a part of the Morgan Generation Assets, the use of low order clearance only for Project Erebus, MMMPs for Awel y Môr, Mona Offshore Wind Project and White Cross) are applied for the Morgan Generation Assets and each relevant Tier 1 project, the residual risk of injury to harbour porpoise is likely to be very small. In addition, it is considered that there are no Tier 2 projects or Tier 3 (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on harbour porpoise due to UXO clearance.</p> <p>The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.</p>	
<p>There is no significant disturbance of the species</p>	<p>As described in Table 1.142 for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC, the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets and Transmission Assets is not expected to surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance in-combination with other projects was concluded as unlikely to be significant.</p> <p>Given that the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb harbour porpoise.</p>	<p>As described in Table 1.142 for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC, the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets In-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects is not expected to surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance in-combination with other projects considered under Scenario 3 is unlikely to be significant.</p> <p>Given that the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not significantly disturb harbour porpoise.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of harbour porpoise (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with the Transmission Assets, effects are not considered to be significant or long-term ensuring that the project will not</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of harbour porpoise (i.e. there will be no habitat loss/disturbance from elevated underwater sound during UXO clearance). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Morgan Generation Assets in-combination with other plans and projects considered under Scenario 3, effects are not considered to be significant or long-term ensuring that the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>affect prey species populations being maintained in the long term. (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>project will not affect prey species populations being maintained in the long term. (see paragraph 1.6.4.470). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>

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1.6.5.211 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

Lundy SAC

Grey seal

1.6.5.212 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.197 to 1.6.5.198. As The Lundy SAC is located at an increased distance from the Morgan Generation Assets than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.213 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.85 to 1.6.2.87) are discussed in Table 1.151. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.151: Conclusions against the conservation objectives of the Lundy SAC for in-combination elevated underwater sound during UXO clearance from UXO detonation during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p> <p>The populations of qualifying species are maintained</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for both the Morgan Generation Assets and the Transmission Assets (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that grey seal would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Given that The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly affect the extent, distribution, structure or function of the grey seal at this SAC. Similarly, underwater sound from UXO clearance associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the population of grey seal from being maintained or restored.</p> <p>Furthermore, there is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, elevated</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for the Morgan Generation Assets and all Tier 1 projects considered under Scenario 3 (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that the effects will be short-lived and reversible. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited, long-term effects on the grey seal feature of the SAC are considered unlikely.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets) that could contribute to an in-combination effect on grey seal due to UXO clearance.</p> <p>Given that The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, underwater sound from UXO detonation associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not significantly affect the extent, distribution, structure or function of the grey seal at this SAC. Similarly, underwater sound from UXO clearance associated with the Morgan Generation Assets In-combination with the projects considered under Scenario 3 will not prevent the population of grey seal from being maintained or restored.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination the Transmission Assets will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of grey seal from being maintained or restored.</p>	<p>Furthermore, there is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of grey seal from being maintained or restored.</p>
<p>The distributions of qualifying species within the site are maintained</p>	<p>Given the distance of Morgan Generation Assets from the Lundy SAC (335.1 km), the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets will not overlap with the SAC. Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the distribution of grey seal from being maintained or restored.</p>	<p>Given the distance of Morgan Generation Assets from the Lundy SAC (335.1 km), the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets will not overlap with the SAC. Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects will not prevent the distribution of grey seal from being maintained or restored.</p>

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- 1.6.5.214 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

- 1.6.5.215 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.197 to 1.6.5.198. As Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.

Conclusions

- 1.6.5.216 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound during UXO clearance during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during UXO clearance against each relevant conservation objective (see paragraphs 1.6.2.92 to 1.6.2.94) are discussed in Table 1.152. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.152: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for in-combination elevated underwater sound during UXO clearance during the construction phase.

The in-combination assessment has not considered Morgan Generation Assets alongside both the Transmission Assets and Morecambe Generation Assets on the basis that the Transmission Assets PEIR already accounts for all UXO predicted to occur under the Morecambe Generation Assets application and therefore this would represent duplication.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p> <p>The populations of qualifying species are maintained</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied for both the Morgan Generation Assets and the Transmission Assets (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that grey seal would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.</p> <p>Given that the Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly affect the extent, distribution, structure or function of the grey seal at this SAC. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets In-combination with the Transmission Assets will not prevent the population of grey seal from being maintained or restored.</p> <p>Furthermore, there is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from underwater sound associated</p>	<p>As described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC in Table 1.146, assuming standard industry measures applied at the Morgan Generation Assets and all Tier 1 projects considered under Scenario 3 (e.g. the measures adopted a part of the Morgan Generation Assets, as outlined in Table 1.56), it is anticipated that the effects will be short-lived and reversible. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited, long-term effects on the grey seal feature of the SAC are considered unlikely.</p> <p>On the basis of information available at the time of writing, there are no Tier 2 or Tier 3 projects (except Transmission Assets and Morecambe Generation Assets, which are assessed under Scenario 1) that could contribute to a in-combination effect on grey seal due to UXO clearance.</p> <p>Given that the Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with other projects considered under Scenario 3 will not significantly affect the extent, distribution, structure or function of the grey seal at this SAC. Similarly, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets In-combination with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>with UXO detonation). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination the Transmission Assets will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of grey seal from being maintained or restored.</p>	<p>projects considered under Scenario 3 will not prevent the population of grey seal from being maintained or restored. Furthermore, there is no pathway for underwater sound in-combination effects from UXO clearance to result in adverse effects on the habitats of grey seal (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and other Tier 1, Tier 2 and Tier 3 projects will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of grey seal from being maintained or restored.</p>
<p>The distributions of qualifying species within the site are maintained</p>	<p>Given the distance of Morgan Generation Assets from the Isles of Scilly Complex SAC (464.9 km), the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets will not overlap with the SAC. Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the distribution of grey seal from being maintained or restored.</p>	<p>Given the distance of Morgan Generation Assets from the Isles of Scilly Complex SAC (464.9 km), the PTS and/or TTS range of the potential impact associated with the Morgan Generation Assets will not overlap with the SAC. Therefore, elevated underwater sound during UXO clearance associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1, Tier 2 and Tier 3 projects will not prevent the distribution of grey seal from being maintained or restored.</p>

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1.6.5.217 Therefore, it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound during UXO clearance with respect to the Morgan Generation Assets in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.6.5.218 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Report Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.5.172 to 1.6.5.217 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.5.219 to 1.6.5.241.

West Wales Marine/Gorllewin Cymru Forol SAC

1.6.5.219 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.6.5.220 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC (paragraphs 1.6.5.197 to 1.6.5.198), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.6.5.221 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Saltee Islands SAC

- 1.6.5.222 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs 1.6.5.197 to 1.6.5.198), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

- 1.6.5.223 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Blasket Islands SAC

- 1.6.5.224 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Mers Celtiques – Talus du golfe de Gascogne SCI

- 1.6.5.225 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Abers – Côte des legends SCI

- 1.6.5.226 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Abers – Côte des legends SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Ouessant-Molène SCI

- 1.6.5.227 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that there is **no risk of**

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an adverse effect on the integrity of the Ouessant-Molène SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.6.5.228 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.6.5.229 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Tregor Goëlo SCI

1.6.5.230 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côtes de Crozon SCI

1.6.5.231 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Chaussée de Sein SCI

1.6.5.232 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Cap Sizun SCI

1.6.5.233 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.6.5.234 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Vauville SCI

1.6.5.235 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.6.5.236 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.6.5.237 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.6.5.238 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

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SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.5.239 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Estuaire de la Rance SCI

1.6.5.240 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.6.5.241 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.172 to 1.6.5.181), it can be concluded that beyond reasonable scientific doubt, there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound during UXO clearance with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

In-combination injury and disturbance from elevated underwater sound during pre-construction site investigation surveys

1.6.5.242 There is potential for injury and disturbance from elevated underwater sound during pre-construction site investigation surveys as a result of activities associated with the Morgan Generation Assets during construction, in-combination with other projects and plans. The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets. Scenario 1 therefore presents the assessment of Morgan Generation Assets alongside the Transmission Assets (paragraph 1.6.5.244 *et seq.*), and Scenario 3 presents the assessment of Morgan Generation Assets alongside Transmission Assets and relevant Tier 1, Tier 2 and Tier 3 projects (paragraph 1.6.5.247 *et seq.*).

1.6.5.243 The risk of injury to marine mammal receptors in terms of PTS as a result of elevated underwater sound during pre-construction site investigation surveys would be

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expected to be localised to within the boundaries of the respective projects. The assessment for the Morgan Generation Assets found that the ranges of effect are expected to be relatively small and the magnitude of the potential impact with respect to auditory injury occurring in marine mammals has been conservatively assessed to be low (see paragraphs 1.6.4.203 *et seq.* and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4). Therefore, there is very low potential for in-combination effects for injury from elevated underwater sound during pre-construction site investigation surveys and the in-combination assessment provided here focuses on disturbance only.

Scenario 1: Morgan Generation Assets together with the Transmission Assets

Construction phase

- 1.6.5.244 The construction of the Morgan Generation Assets together with construction phase of the Transmission Assets may lead to in-combination effects of injury and disturbance from elevated underwater sound during pre-construction site investigation surveys.
- 1.6.5.245 The Transmission Assets PEIR assessed potential disturbance ranges to be within 100s of meters from the sound source, with maximum disturbance ranges predicted out to 17.3 km for vibro-coring for all relevant species. The majority of the disturbance ranges for the Morgan Generation Assets were also within 100s of metres, with the largest disturbance range predicted out to 55 km during vibro-coring for all relevant species (due to the higher source levels for this survey equipment in comparison to the others). Based on the spatial overlap of the two projects, if pre-construction site investigation surveys were to temporally overlap, spatial overlap of disturbance ranges would occur. As such, animals are likely to be displaced from an area comparable to disturbance ranges at the Morgan Generation Assets alone.
- 1.6.5.246 The impact of site investigation surveys leading to behavioural effects is predicted to be of local to regional spatial extent. It is assumed whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance (e.g. cessation of feeding), these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.

Scenario 3: Morgan Generation Assets together with the Transmission Assets and all relevant Tier 1, Tier 2 and Tier 3 projects

Construction phase

Tier 1

- 1.6.5.247 The construction of the Morgan Generation Assets, together with construction phase of the Transmission Assets and Mona Offshore Wind Project as well as construction and/or operations and maintenance phases of other relevant Tier 1 projects (ESB Celtic Offshore Wind - Site Investigations off Waterford and Cork, ESB Wind Development Limited Site Investigations at Sea Stacks Offshore Wind off Dublin and Wicklow, ESB Wind Development Limited Site Investigations off Waterford and Cork Coasts - Helvick Head Offshore Wind, Mainstream Renewable Power Ltd- Site Investigations off Co, Dublin, RWE Renewables Ireland Site Investigations for Dublin Array Offshore Wind Farm, Shelmalere Offshore Wind Farm - Site Investigations off Counties Wexford and Wicklow, Site Investigations for proposed Wicklow Project

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Offshore Wind Farm, off Counties Wicklow and Dublin, Site Investigations for the proposed Kinsale Project offshore wind farm, off County Cork, Site Investigations for the proposed Sunrise Offshore Wind Farm, off Counties Dublin and Wicklow, Site Investigations for the proposed Wicklow Project offshore wind farm, off County Wicklow, SSE Renewables Celtic Sea surveys, Statkraft North Irish Sea Array (NISA) Site Investigations, Simply Blue Energy (Kinsale) Limited surveys) may lead to in-combination effects of injury and disturbance from elevated underwater sound during pre-construction site investigation surveys.

- 1.6.5.248 For Tier 1 projects with temporal overlap with the construction phase of Morgan Generation Assets, except Mona Offshore Wind Project, effects as a result of elevated underwater sound during pre-construction site investigation surveys were not included in the respective Environmental Statements. To allow a quantitative approach to assessment, there are up to 14 Tier 1 site investigation surveys alongside surveys at Mona Offshore Wind Project identified in the in-combination screening area for marine mammals. Surveys typically occur over short durations (typically up to two months) (based on expert judgment and agreed with the EWG) and therefore as a conservative approach it is assumed as a worst-case scenario that up to two surveys (in addition) could overlap with the Morgan site-investigation surveys at any one point.
- 1.6.5.249 The project alone for Morgan Generation Assets predicted most of the disturbance ranges within 100s of meters with the greatest distance over which the disturbance can occur out to approximately 17.3 km for SBPs and 55 km for vibro-coring.
- 1.6.5.250 Based on the distance from the Morgan Generation Assets to the Mona Offshore Wind Project (11.1 km) if pre-construction site investigation surveys were to temporally overlap, spatial overlap of disturbance ranges could occur. As such, animals have the potential to be displaced from an area greater than the Morgan Generation Assets alone.
- 1.6.5.251 However, for other 14 Tier projects, based on the distance from the Morgan Generation Assets (minimum distance is 104.2 km at Mainstream Renewable Power Ltd- Site Investigations off Co. Dublin), if pre-construction site investigation surveys were to temporally overlap with the construction phase of the Morgan Generation Assets (dates are currently unknown), the disturbance contours are unlikely to overlap. The above assumes the same disturbance ranges as Morgan Generation Assets and does not take into account differences in water column depth, pressure, temperature gradients, salinity as well as water surface and seabed conditions at the different site-investigation survey locations (see Volume 3, Annex 3.1: Underwater sound technical report of the Environmental Statement for detail (Document Reference F3.3.1)).
- 1.6.5.252 The duration of site-investigation surveys is considered to be short term and localised for each project. It should be noted that these will occur intermittently over a number of years with isolated surveys occurring at different points in time throughout the in-combination screening area, though up to two is assumed to be occurring in addition to Morgan Generation Assets,
- 1.6.5.253 The impact of site investigation surveys leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and high reversibility (elevated underwater sound occurs only during surveys). The effect of behavioural disturbance is reversible (with animals returning to baseline levels soon after surveys have ceased).

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Tier 2

- 1.6.5.254 The construction of the Morgan Generation Assets, together with construction phase of the Tier 2 Project the Transmission Assets may lead to in-combination effects of injury and disturbance from elevated underwater sound during pre-construction site investigation surveys.
- 1.6.5.255 Given the temporal overlap, the construction phase of the Morgan Generation Assets alongside Tier 1 projects and the Tier 2 project Transmission Assets (see Scenario 1) could lead to disturbance to marine mammals as a result of sound generated by pre-construction site investigation surveys. The in-combination assessment for Transmission Assets is provided for Scenario 1 in paragraph 1.6.5.244 *et seq.* As such, to avoid repetition, the in-combination assessment with this project was not reiterated for Scenario 3.
- 1.6.5.256 Given the approach (described in paragraph 1.6.5.247 *et seq.* for Tier 1 projects) to assessing two additional site investigation surveys alongside those for Morgan Generation Assets, the conclusions for Tier 1 and Tier 2 projects are the same.
- 1.6.5.257 Although the duration of site-investigation surveys is considered to be short term and localised for each project, it should be noted that these will occur intermittently over a number of years with isolated surveys occurring at different points in time throughout the Irish Sea.
- 1.6.5.258 Therefore, the in-combination impact of site investigation surveys leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

- 1.6.5.259 There is potential for injury and disturbance from elevated underwater sound from pre-construction site investigation surveys on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of activities associated with the Morgan Generation Assets during construction, in-combination with activities associated with other projects/plans.
- 1.6.5.260 There is very low potential for in-combination effects for injury from elevated underwater sound during pre-construction site investigation surveys and the in-combination assessment provided here focuses on disturbance only.
- 1.6.5.261 The impact of elevated underwater sound during pre-construction site investigation surveys leading to behavioural disturbance from the construction of the Morgan Generation Assets together with the construction phase of the Transmission Assets is predicted to be of local to regional spatial extent. Although some ecological functions could be inhibited in the short-term, these are reversible on recovery of the animal's hearing and not considered likely to lead to any long-term effects on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.262 The impact of elevated underwater sound during pre-construction site investigation surveys leading to behavioural disturbance from the construction of the Morgan Generation Assets together with Tier 1, 2 and 3 projects assessed under Scenario 3 is predicted to be of local to regional spatial extent, medium term duration, intermittent and high reversibility (elevated underwater sound occurs only during surveys). Any effects of behavioural disturbance are considered to be reversible, and will not lead to

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any long-term effects on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conclusions

- 1.6.5.263 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.153. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.153: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC from in-combination elevated underwater sound during pre-construction site investigation surveys.

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour porpoise are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb the harbour porpoise designated feature.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour porpoise are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not significantly disturb the harbour porpoise designated feature.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	As for Scenario 1, there is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

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1.6.5.264 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.6.5.265 The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.263 to 1.6.5.264. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.266 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.106. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.154: Conclusions against the conservation objectives of the North Channel SAC from in-combination elevated underwater sound during pre-construction site investigation surveys.

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour porpoise are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb the harbour porpoise designated feature.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour porpoise are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not significantly disturb the harbour porpoise designated feature.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	As for Scenario 1, there is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

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1.6.5.267 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.6.5.268 For Scenario 1, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.237 above). In addition, the impact of site investigation surveys leading to behavioural effects on harbour seal features of the Strangford Lough SAC is predicted to be of local to regional spatial extent. It is assumed whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.

1.6.5.269 For Scenario 3, the impact of elevated underwater sound during pre-construction site investigation surveys leading to behavioural disturbance on harbour seal from the construction of the Morgan Generation Assets together with the Transmission Assets and all relevant Tier 1, 2 and 3 projects assessed is predicted to be of local to regional spatial extent, medium term duration, intermittent and high reversibility (elevated underwater sound occurs only during surveys). Any effects of behavioural disturbance are considered to be reversible, and will not lead to any long-term effects on the harbour seal feature of the Strangford Lough SAC.

Conclusions

1.6.5.270 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraph 1.6.2.19) are discussed in Table 1.155. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.155: Conclusions against the conservation objectives of the Strangford Lough SAC from in-combination elevated underwater sound during pre-construction site investigation surveys

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the population of harbour seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound</p>	<p>As for Scenario 1, there is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

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1.6.5.271 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.6.5.272 The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC (94.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.270 to 1.6.5.271. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.273 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraph 1.6.2.24) are discussed in Table 1.156. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.156: Conclusions against the conservation objectives of the Murlough SAC from in-combination elevated underwater sound during pre-construction site investigation surveys.

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the population of harbour seal from being maintained or enhanced.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
Maintain and enhance, as appropriate, physical features used by harbour seal within the site	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.	As for Scenario 1, there is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent physical features used by harbour seal within the site from being maintained or enhanced.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.274 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC

Bottlenose dolphin and grey seal

1.6.5.275 For Scenario 1, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.237 above). In addition, the impact of site investigation surveys leading to behavioural effects on bottlenose dolphin or grey seal features of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC is predicted to be of local to regional spatial extent. It is assumed whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.

1.6.5.276 For Scenario 3, the impact of elevated underwater sound during pre-construction site investigation surveys leading to behavioural disturbance from the construction of the Morgan Generation Assets together with the Transmission Assets and all relevant Tier 1, 2 and 3 projects assessed is predicted to be of local to regional spatial extent, medium term duration, intermittent and high reversibility (elevated underwater sound occurs only during surveys). Any effects of behavioural disturbance are considered to be reversible, and will not lead to any long-term effects on the bottlenose dolphin and grey seal feature of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.

Conclusions

1.6.5.277 It is concluded that no adverse effects on the qualifying bottlenose dolphin and grey seal features which undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.157. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.157: Conclusions against the conservation objectives of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC from in-combination elevated underwater sound during pre-construction site investigation surveys.

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and bottlenose dolphin and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin or grey seal for the foreseeable future.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from underwater sound from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and bottlenose dolphin and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not reduce nor likely reduce the natural range of the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p>	<p>populations of bottlenose dolphin or grey seal for the foreseeable future.</p> <p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.278 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.6.5.279 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.277 to 1.6.5.278. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.280 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraph 1.6.2.55) are discussed in Table 1.158. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.158: Conclusions against the conservation objectives of The Maidens SAC from in-combination elevated underwater sound during pre-construction site investigation surveys

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Maidens SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
Maintain and enhance, as appropriate, physical features used by grey seal within the site	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by grey seal within the site from being maintained or enhanced.	As for Scenario 1, there is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by grey seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent physical features used by grey seal within the site from being maintained or enhanced.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.281 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.5.282 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.277 to 1.6.5.278. Therefore, it is considered that effects would be of similar if not lower magnitude.

Grey seal

1.6.5.283 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.5.300.

Conclusions

1.6.5.284 It is concluded that no adverse effects on the qualifying bottlenose dolphin features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.61 to 1.6.2.65) are discussed in Table 1.59. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.159: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC from in-combination elevated underwater sound during pre-construction site investigation surveys

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and bottlenose dolphin are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, elevated underwater sound during pre-construction site investigation surveys for</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and bottlenose dolphin are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, elevated underwater sound during pre-construction site investigation surveys for Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not reduce the natural</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	Morgan Generation Assets in-combination with the Transmission Assets will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.	range of the populations of bottlenose dolphin for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.	As for Scenario 1, there is no pathway for elevated underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.285 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.6.5.286 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.277 to 1.6.5.278. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.287 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.71 to 1.6.2.74) are discussed in Table 1.160. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.160: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC from in-combination elevated underwater sound during pre-construction site investigation surveys

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lley Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce nor likely reduce the</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the populations of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not reduce nor likely reduce the natural range of the populations of grey seal for the foreseeable future.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	natural range of the populations of grey seal for the foreseeable future.	
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by grey seal within the site from being maintained or enhanced.	As for Scenario 1, there is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by grey seal within the site. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent physical features used by grey seal within the site from being maintained or enhanced.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.288 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.5.289 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.263 to 1.6.5.264. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.290 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.79 to 1.6.2.80) are discussed in Table 1.161. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.161: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC from in-combination elevated underwater sound during pre-construction site investigation surveys

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>The Bristol Channel Approaches SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour porpoise are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb the harbour porpoise designated feature.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and harbour porpoise are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not significantly disturb the harbour porpoise designated feature.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.291 Therefore, it can be concluded beyond reasonable scientific doubt that there **is no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Lundy SAC

Grey seal

1.6.5.292 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.277 to 1.6.5.278. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.293 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.85 to 1.6.2.87) are discussed in Table 1.162. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.162: Conclusions against the conservation objectives of the Lundy SAC from in-combination elevated underwater sound during pre-construction site investigation surveys

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the population and distribution of grey seal from being maintained or restored.</p>
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p>	<p>There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure</p>	<p>As for Scenario 1, there is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
The supporting processes on which the habitats of qualifying species rely are maintained	and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the supporting processes on which grey seal rely on from being maintained or restored.	prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not prevent the supporting processes on which grey seal rely on from being maintained or restored.

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1.6.5.294 Therefore, it can be concluded beyond reasonable scientific doubt that there **is no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.6.5.295 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.277 to 1.6.5.278. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.296 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound during pre-construction site investigation surveys during the construction phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound during pre-construction site investigation surveys against each relevant conservation objective (see paragraphs 1.6.2.92 to 1.6.2.94) are discussed in Table 1.163. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.163: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC from in-combination elevated underwater sound during pre-construction site investigation surveys.

The impact of injury and disturbance from elevated underwater sound generated from pre-construction survey sources was not presented in the Morecambe Generation Assets PEIR marine mammal chapter (Morecambe Offshore Wind Ltd, 2023). As such, the in-combination assessment has not considered Morgan Generation Assets alongside the Morecambe Generation Assets

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyen Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyen Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC.</p> <p>For both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>As stated for Scenario 1, for both the Morgan Generation Assets and the Transmission Assets, the majority of predicted disturbance ranges from elevated underwater sound during pre-construction site investigation surveys are within hundreds of metres (see paragraph 1.6.5.245 above). There were no Tier 3 projects identified for this impact, and, conservatively, up to two additional surveys could overlap with the Morgan Generation Assets site-investigation surveys at any one point for the projects in Tier 1 and Tier 2 (see paragraphs 1.6.5.248 and 1.6.5.256).</p> <p>Underwater sound from pre-construction site investigation surveys will be intermittent, there is no potential for injury within range of the SAC, and grey seal are likely to recover from disturbance. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not prevent the population and distribution of grey seal from being maintained or restored.</p>
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p>	<p>There is no pathway for underwater sound during pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and</p>	<p>As for Scenario 1, there is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and the Tier 1 and 2 projects will not</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
The supporting processes on which the habitats of qualifying species rely are maintained	function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the supporting processes on which grey seal rely on from being maintained or restored.	prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound during pre-construction site investigation surveys associated with the Morgan Generation Assets in-combination with the Transmission Assets and Tier 1 and 2 projects will not prevent the supporting processes on which grey seal rely on from being maintained or restored.

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1.6.5.297 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.6.5.298 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Report Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.5.263 to 1.6.5.297 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.5.299 to 1.6.5.321.

West Wales Marine/Gorllewin Cymru Forol SAC

1.6.5.299 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.6.5.300 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.5.277 to 1.6.5.278), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.6.5.301 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Saltee Islands SAC

- 1.6.5.302 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.5.277 to 1.6.5.278), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

- 1.6.5.303 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Blasket Islands SAC

- 1.6.5.304 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Mers Celtiques – Talus du golfe de Gascogne SCI

- 1.6.5.305 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Abers – Côte des legends SCI

- 1.6.5.306 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Abers – Côte des legends SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Ouessant-Molène SCI

- 1.6.5.307 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

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SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.6.5.308 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.6.5.309 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded that there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Tregor Goëlo SCI

1.6.5.310 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côtes de Crozon SCI

1.6.5.311 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Chaussée de Sein SCI

1.6.5.312 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound during pre-

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construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cap Sizun SCI

- 1.6.5.313 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

- 1.6.5.314 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Vauville SCI

- 1.6.5.315 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

- 1.6.5.316 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

- 1.6.5.317 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Banc et récifs de Surtainville SCI

- 1.6.5.318 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

- 1.6.5.319 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Estuaire de la Rance SCI

- 1.6.5.320 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

- 1.6.5.321 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.263 to 1.6.5.267), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound during pre-construction site investigation surveys with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

In-combination injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities

- 1.6.5.322 There is potential for injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets during construction, to act in-combination with activities associated with all the projects/plans in Table 1.125.

- 1.6.5.323 As for the assessment of the Morgan Generation Assets alone, the risk of injury in terms of PTS to marine mammal receptors as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities would be expected to be very low. PTS thresholds would not be exceeded or would be very localised (<10 m) from the source. The assessment for Morgan Generation Assets alone (paragraphs

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1.6.4.296 to 1.6.4.315) found relatively small ranges of effects and low potential impact with respect to auditory injury occurring in marine mammal qualifying features. Given the above, there is very low potential for in-combination effects for injury from elevated underwater sound due to vessel use and other (non-piling) sound producing activities. Instead, the in-combination assessment provided below focuses on disturbance only for this potential impact.

- 1.6.5.324 Given the challenges in quantifying the response ranges based on a simple threshold approach (e.g. because it does not take into account context), empirical evidence suggests that for areas with existing vessel traffic, acoustic activity (and therefore presence of some marine species) may be reduced. Therefore, to give a quantitative indication of impact, a range of distances from empirical studies (1 km to 7 km) have been used as an effective impact range and the numbers of animals predicted to be disturbed as presented in the Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4).
- 1.6.5.325 The in-combination assessment considered Scenario 1 as the assessment of Morgan Generation Assets alongside the Transmission Assets (paragraph 1.6.5.326 *et seq.*), and Scenario 2 presents the assessment of Morgan Generation Assets alongside Transmission Assets and Morecambe Generation Assets (paragraph 1.6.5.332 *et seq.*) and Scenario 3 presents the assessment of Morgan Generation Assets alongside Transmission Assets, Morecambe Generation Assets and relevant Tier 1, Tier 2 and Tier 3 projects (paragraph 1.6.5.338 *et seq.*).

Scenario 1: Morgan Generation Assets together with the Transmission Assets

Construction and decommissioning phases

- 1.6.5.326 The construction and decommissioning phases of the Morgan Generation Assets, together with construction and decommissioning phases of the Transmission Assets may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.
- 1.6.5.327 The Transmission Assets MDS identified up to 70 construction vessels on site at any one time and estimated the greatest modelled disturbance range for vessels at the Transmission Assets as 20 km, for survey and support vessels, CTV, scour/cable protection and seabed preparation/installation vessels. Modelled disturbance ranges for cable trenching activities were estimated at up to 18 km.
- 1.6.5.328 It is likely that several activities could be potentially occurring at the same time across the projects and therefore disturbance ranges may extend from several vessels/locations. However, as presented in paragraph 1.6.5.324, a range of distances from empirical studies (1 to 7 km) were used as effective impact ranges (Brandt *et al.*, 2018; McQueen *et al.* 2020; Benhemma-Le Gall *et al.*, 2021; Wisniewska *et al.* 2018).
- 1.6.5.329 Introduction of vessels will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of tolerance to sound from vessels. Vessel activity is expected to be localised to each project, the duration of vessel activity is considered to be medium term (throughout the construction phase of the Morgan Generation Assets) and vessel movements will occur intermittently over a number of years.
- 1.6.5.330 Whilst disturbance ranges such as 7 km could potentially affect animals over regional scales, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets

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and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone. As such, vessel numbers have not been summed, in-combination.

- 1.6.5.331 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects for Scenario 1 are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Scenario 2: Morgan Generation Assets together with the Transmission Assets and Morecambe Generation Assets

Construction and decommissioning phases

- 1.6.5.332 The construction and decommissioning phases of the Morgan Generation Assets, together with construction, operation and maintenance and/or decommissioning phases of the Transmission Assets and Morecambe Offshore Wind Farm may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.
- 1.6.5.333 The MDS presented in the PEIR for the Morecambe Offshore Windfarm: Generation Assets (Morecambe Offshore Windfarm Ltd, 2023) anticipated up to 30 vessels on site at any one time, with 150 return trips for delivery of main components and installation over the construction phase, and 2,778 return trips per year for support vessels. Disturbance ranges were not modelled, but assessment for all species was based on a disturbance impact range of 2 km (based upon studies by Brandt *et al.*, 2018 and Benhemma-Le Gall *et al.*, (2021).
- 1.6.5.334 As presented in paragraphs 1.6.5.324 to 1.6.5.326 for Scenario 1, disturbance ranges may extend from several vessels/locations and the approach for this in-combination assessment is such that a range of distances from empirical studies (1 to 7 km) were used as effective impact ranges.
- 1.6.5.335 Introduction of vessels will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of tolerance to sound from vessels. Vessel activity is expected to be localised to each project, the duration of vessel activity is considered to be medium term (throughout the construction phase of the Morgan Generation Assets) and vessel movements will occur intermittently over a number of years.
- 1.6.5.336 Whilst disturbance ranges of up to 7 km could potentially affect animals over regional scales, many vessels associated with the construction of the Transmission Assets are likely to also be associated with both the Morgan Generation Assets and the Morecambe Generation Assets and therefore vessel numbers have not been summed, in-combination.
- 1.6.5.337 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects for Scenario 2 are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Scenario 3: Morgan Generation Assets together with the Transmission Assets and relevant Tier 1, Tier 2 and Tier 3 projects

Construction and decommissioning phases

Tier 1

- 1.6.5.338 The construction and decommissioning phases of the Morgan Generation Assets, together with construction, operation and maintenance and/or decommissioning phases of the Transmission Assets, Morecambe Generation Assets, Mona Offshore Wind Project and other Tier 1 projects (Awel y Môr, Project Erebus, West Anglesey Demonstration Zone tidal site, Twin Hub and White Cross Offshore Windfarm) may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.
- 1.6.5.339 Tier 1 projects (and respective distances from the Morgan Array Area) considered in the in-combination assessment include: Mona Offshore Wind Project (11.1 km), Awel y Môr Offshore Wind Farm (46.8 km), West Anglesey Demonstration Zone tidal site (79.3 km), Project Erebus (237.5 km) and White Cross Offshore Wind Farm (319.6 km).
- 1.6.5.340 The Mona Offshore Wind Project MDS identified up to a total of 69 construction vessels on site at any one time (Mona Array Area), up to a total of 17 construction vessels on site at any one time (Mona Offshore Cable Corridor and Access Areas) and up to 12 vessels at any one time associated with the landfall cable installation. Based on a sound modelling assessment, the maximum disturbance range is 5.38 km.
- 1.6.5.341 The Awel y Môr Offshore Wind Farm Project MDS identified up to 101 construction vessels in total, of which 35 may be on site during peak period. The Environmental Statement assumed that based on Benhemma-Le Gall *et al.* (2021), harbour porpoise and other cetaceans may be displaced up to 4 km from construction vessels. Identified localised behavioural disturbance ranges for harbour porpoise and grey seal (avoidance reported up to 5 km from dredging activities). For bottlenose dolphin dredging was predicted to cause a reduction in presence and avoidance of the area for five weeks
- 1.6.5.342 The West Anglesey Demonstration Zone tidal site Project MDS identified up to 16 vessels on site at any one time during the operations and maintenance phase. The maximum behavioural disturbance range across all species was predicted in harbour porpoise for two percussive drilling rigs and cutter-suction dredging as up to 530 m and 580 m, respectively.
- 1.6.5.343 The Twin Hub MDS specifies two floating platforms hosting leaning wind turbines with potential capacity of up to 32 MW. Vessels may include anchor handling tugs and cable lay vessels, but no quantification of vessel movements is included in the marine licences.
- 1.6.5.344 The White Cross Offshore Wind Farm Project MDS identified up to five vessels on site at any one time during the construction phase. The assessment concluded that the number of vessels would not exceed the Heinänen and Skov (2015) threshold (five vessels within 49.4 km² would equate to approximately 0.1 vessels per km²). The Environmental Statement assumed that based on Benhemma-Le Gall *et al.* (2021), disturbance ranges for non-piling activities (other than vessels) would be up to 4 km from construction vessels.
- 1.6.5.345 The Project Erebus Project MDS identified up to two CTV on site per day during the operations and maintenance phase (assumed stationary or slow moving). The

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maximum predicted behavioural disturbance range for large vessels was assessed as 480 m for minke whale. However, this species is not assessed in the HRA Stage 2 ISAA, as it is not designated as an Annex II species.

- 1.6.5.346 Introduction of vessels will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of tolerance to sound from vessels. Vessel activity is expected to be localised to each project, the duration of vessel activity is considered to be medium term (throughout the construction phase of the Morgan Generation Assets) and vessel movements will occur intermittently over a number of years.
- 1.6.5.347 As presented in paragraph 1.6.5.324 to 1.6.5.326 for Scenario 1, disturbance ranges may extend from several vessels/locations and the approach for this in-combination assessment is such that a range of distances from empirical studies (1 to 7 km) were used as effective impact ranges. Vessels such as boulder clearance, jack-up rigs, tug/anchor handlers and guard vessels will have smaller disturbance ranges (between 1 to 4 km) and therefore the extent of effect will be local. Where vessels may disturb animals up to ranges of 7 km, this represents a larger proportion of the Irish and Celtic Seas and may potentially affect animals over regional scales. Nevertheless, most of the vessels will be associated with the construction phases of Awel y Môr Offshore Wind Farm, Mona Offshore Wind Project and Morgan Generation Assets and all three projects are located within an area of relatively low marine mammal densities (except bottlenose dolphin, see Volume 4, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference F4.4.1)).
- 1.6.5.348 Therefore, in-combination across the sites there will be an increase in vessel activity within the Celtic and Irish Seas regional area. This represents an uplift from the current baseline, although noting that the assessments are based on the MDS, the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port. Therefore, the number of vessels present at each project at any given time is not additive. Introduction of vessels during construction and operations and maintenance phases of the projects will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of habituation to vessel sounds.
- 1.6.5.349 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects for Scenario 3 are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Tier 2

- 1.6.5.350 The construction and decommissioning phases of the Morgan Generation Assets, together with construction, operation and maintenance and/or decommissioning phases of the Transmission Assets, Morecambe Generation Assets and other Tier 2 projects (Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park, LIÿr 1, LIÿr 2, Mooire Vannin Offshore Wind Farm, North Celtic Sea Offshore Wind Farm, North Channel Wind 1, North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Offshore Wind Farm, Project Valorous, Shelmalere Offshore Wind Farm, Simply Blue Emerald and Wind Project Ilen) may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.

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- 1.6.5.351 The construction of the Morgan Generation Assets, together with construction phase of the Transmission Assets, Morecambe Offshore Wind Farm as well as construction and/or operations and maintenance phases of Tier 2 projects (Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park, LIÿr 1, LIÿr 2, Mooire Vannin Offshore Wind Farm, North Celtic Sea Offshore Wind Farm, North Channel Wind 1, North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Offshore Wind Farm, Project Valorous, Shelmalere Offshore Wind Farm, Simply Blue Emerald and Wind Project Ilen) may lead to disturbance to marine mammals from vessel use and other (non-piling) sound producing activities. Timelines of the construction (as well as operations and maintenance phases) of Arklow Bank Wind Park Phase 2, North Celtic Sea Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen and Simply Blue Emerald are unknown. However, it has been conservatively assumed that there will be a temporal overlap with the construction phase of the Morgan Generation Assets. Given that EIA Scoping Reports do not provide detailed information on vessel numbers, it is not possible to undertake full, quantitative assessment for this impact and therefore a qualitative assessment is provided below.
- 1.6.5.352 The in-combination assessment for Transmission Assets is provided as Scenario 1 in paragraph 1.6.5.326 *et seq.* and assessment for Transmission Assets and Morecambe Generation Assets is provided in paragraph 1.6.5.332 *et seq.* As such, to avoid repetition, the in-combination assessment with both projects was not reiterated for Scenario 3. Given that EIA Scoping Reports for other Tier 2 projects do not provide detailed information on vessel numbers, it is not possible to undertake full, quantitative assessment for this impact and therefore a qualitative assessment is provided below.
- 1.6.5.353 The range of effects for remaining Tier 2 projects is predicted to be localised to within each project boundary. Given that EIA Scoping Reports do not provide detailed information about numbers of vessels involved, it is not possible to undertake full, quantitative assessment including the other projects for this potential impact. For most of the Tier 2 projects (including Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park, LIÿr 1, LIÿr 2, North Celtic Sea Offshore Wind Farm, North Channel Wind 1, - North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen, Project Valorous, Shelmalere Offshore Wind Farm and Simply Blue Emerald), the distances from the Morgan Generation Assets are greater than 100 km and there is no potential for overlap in the behavioural Zol. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.
- 1.6.5.354 The duration of vessel activity is considered to be medium term, however, it should be noted that vessel movements will occur intermittently over a number of years. The in-combination number of vessels for Tier 1 projects represents an increase compared to the average vessel traffic (see paragraph 1.6.5.348). Although the exact number of vessels associated with most Tier 2 projects is unknown, if construction phase at all Tier 2 projects will occur simultaneously, vessels associated with each project will contribute further to the increase over a number of years.
- 1.6.5.355 In-combination, construction activities could lead to a larger area of disturbance to marine mammals at any one time across the Irish and Celtic seas compared to the Morgan Generation Assets alone assuming that projects were to conduct construction activities over similar time periods.
- 1.6.5.356 As presented in paragraph 1.6.5.324 to 1.6.5.326 for Scenario 1, disturbance ranges may extend from several vessels/locations and the approach for this in-combination

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assessment is such that a range of distances from empirical studies (1 to 7 km) were used as effective impact ranges. Vessels such as boulder clearance, jack-up rigs, tug/anchor handlers and guard vessels will have smaller disturbance ranges (between 1 to 4 km) and therefore the extent of effect will be local. Where vessels may disturb animals up to ranges of 7 km, this represents a larger proportion of the Irish and Celtic Seas and may potentially affect animals over regional scales. Although animals may potentially be disturbed from isolated project areas at different points in time, in the context of the wider habitat available within the Celtic and Irish Seas regional study area, the scale of the disturbance effects (which would be localised) is considered to be small.

- 1.6.5.357 Therefore, the potential in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Tier 3

- 1.6.5.358 The construction and decommissioning phases of the Morgan Generation Assets, together with construction and/or operation and maintenance phases of the Transmission Assets, Morecambe Generation Assets and other Tier 3 projects (Blackwater Offshore Wind Farm, Braymore Point, Celtic Sea Array Offshore Wind Farm, Cork Offshore Wind Project, Clogher Head Offshore Wind Farm, Codling Wind Park Extension Offshore Wind Farm, Cooley Point Offshore Wind Farm, Eni Hynet CCS, Inis Offshore Wind Munster, Lir Offshore Array, MaresConnect, Project Saoirse, South Pembrokeshire Demonstration Zone and Spiorad na Mara Offshore Wind Project) may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.
- 1.6.5.359 Eni Hynet CCS, Lir Offshore Array and MaresConnect are located within 50 km of Morgan Generation Assets. All other Tier 3 projects (set out in paragraph 1.6.5.358; n = 10) are all located over 100 km away from the Morgan Generation Assets.
- 1.6.5.360 The construction timelines for Eni Hynet CCS and Lir Offshore Array are not yet available, but given that they are in pre-application stage, construction phases may overlap temporally towards the end of the Morgan Generation Assets construction phase. It is anticipated that the construction phase of MaresConnect (estimated 2025, with operations phase commencing in 2026) will be completed prior to construction activities at Morgan Generation Assets (MaresConnect, 2023). Maintenance of the cable during the operations phase typically involves considerably fewer vessels and round trips compared to construction.
- 1.6.5.361 Whilst this has the potential to increase vessel numbers in the Irish Sea this is not expected to be significantly larger than that already assessed for Morgan Generation Assets alongside Tier 1 and Tier 2 projects (see paragraph 1.6.5.338 and 1.6.5.350 respectively).
- 1.6.5.362 Therefore, the potential in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

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North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

- 1.6.5.363 There is potential for injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of activities associated with the Morgan Generation Assets during construction, in-combination with activities associated with other projects/plans.
- 1.6.5.364 The in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects from the Morgan Generation Assets in-combination with the Transmission Assets is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact will not lead to any long-term effects on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.
- 1.6.5.365 For both Scenario 2 and Scenario 3, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact from these projects in-combination will not lead to any long-term effects on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conclusions

- 1.6.5.366 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.164. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.164: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities with the Morgan Generation Assets in-combination with other projects will not significantly disturb the harbour porpoise designated feature.</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges of up to 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		<p>Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.</p>	<p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	Transmission Assets and Morecambe Offshore Windfarm will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

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1.6.5.367 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.6.5.368 The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.366 to 1.6.5.367. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.369 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Channel SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.165. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.165: Conclusions against the conservation objectives of the North Channel SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not significantly disturb the harbour porpoise designated feature.</p>	<p>Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.</p>	<p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	condition of supporting habitats and processes or reduce the availability of prey.	Transmission Assets and Morecambe Offshore Windfarm will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

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1.6.5.370 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.6.5.371 The in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects from the Morgan Generation Assets in-combination with the Transmission Assets is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact will not lead to any long-term effects on the harbour seal feature of the Strangford Lough SAC.

1.6.5.372 For both Scenario 2 and Scenario 3, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact from these projects in-combination will not lead to any long-term effects on the harbour seal feature of the Strangford Lough SAC.

Conclusions

1.6.5.373 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Strangford Lough SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraph 1.6.2.19) are discussed in Table 1.166. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.166: Conclusions against the conservation objectives of the Strangford Lough SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges of up to 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the population of harbour seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>Physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.374 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.6.5.375 The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC (94.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.373 to 1.6.5.374. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.376 It is concluded that no adverse effects on the qualifying harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraph 1.6.2.24) are discussed in Table 1.167. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.167: Conclusions against the conservation objectives of the Murlough SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition.</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the harbour seal feature from being maintained or restored to favourable condition.</p> <p>Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not prevent the population of harbour seal from being maintained or enhanced.</p>		<p>within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the population of harbour seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>Physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.377 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC

Bottlenose dolphin and grey seal

1.6.5.378 The in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects from the Morgan Generation Assets in-combination with the Transmission Assets is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact will not lead to any long-term effects on the bottlenose dolphin or grey seal features of the Strangford Lough SAC.

1.6.5.379 For both Scenario 2 and Scenario 3, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact from these projects in-combination will not lead to any long-term effects on the bottlenose dolphin or grey seal features of the Strangford Lough SAC.

Conclusions

1.6.5.380 It is concluded that no adverse effects on the qualifying bottlenose dolphin and grey seal features which undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.34 to 1.6.2.36) are discussed in Table 1.168. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.168: Conclusions against the conservation objectives of the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not reduce nor likely reduce the natural range of the populations of bottlenose</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges of up to 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping where possible routes to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>dolphin or grey seal for the foreseeable future.</p>	<p>Offshore Windfarm will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin or grey seal for the foreseeable future.</p>	<p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin or grey seal for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond</p>	<p>There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
the site is stable or increasing	presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.	Morecambe Offshore Windfarm will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.	Offshore Windfarm and Tier 1, 2 and 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.381 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.6.5.382 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.380 to 1.6.5.381. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.383 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraph 1.6.2.55) are discussed in Table 1.169. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.169: Conclusions against the conservation objectives of The Maidens SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Maidens SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural Zol. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>	<p>population and distribution of grey seal from being maintained or enhanced.</p>	<p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by grey seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent physical features used by grey seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent physical features used by grey seal within the site from being maintained or enhanced.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.384 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.5.385 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.380 to 1.6.5.381. Therefore, it is considered that effects would be of similar if not lower magnitude.

Grey seal

1.6.5.386 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.5.403.

Conclusions

1.6.5.387 It is concluded that no adverse effects on the qualifying bottlenose dolphin and grey seal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.61 to 1.6.2.65) are discussed in Table 1.170. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.170: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping where possible routes to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Transmission Assets will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, underwater sound as a result of vessels and other activities for Morgan Generation Assets in-combination with the Transmission Assets will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>	<p>adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, underwater sound as a result of vessels and other activities for Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>	<p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, underwater sound as a result of vessels and other activities for Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2, and 3 projects will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.388 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.6.5.389 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.380 to 1.6.5.381. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.390 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.71 to 1.6.2.74) are discussed in Table 1.171. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.171: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not reduce nor likely reduce the natural range of the population of grey seal for the foreseeable future.</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce nor likely reduce the natural range of the population of grey seal for the foreseeable future.</p>		<p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Asset, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not reduce nor likely reduce the natural range of the population of grey seal for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of grey seal.</p>	<p>As per Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution,</p>	<p>As per Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		<p>abundance and populations dynamics of the population of grey seal.</p>	<p>the distribution, abundance and populations dynamics of the population of grey seal.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.391 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.5.392 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.366 to 1.6.5.367. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.393 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.79 to 1.6.2.80) are discussed in Table 1.172. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.172: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>The Bristol Channel Approaches SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not significantly disturb the harbour porpoise designated feature.</p>	<p>Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.</p>	<p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	condition of supporting habitats and processes or reduce the availability of prey.	Transmission Assets and Morecambe Offshore Windfarm will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.394 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Lundy SAC

Grey seal

1.6.5.395 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.380 to 1.6.5.381. It is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.396 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.85 to 1.6.2.87) are discussed in Table 1.173. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.173: Conclusions against the conservation objectives of the Lundy SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping where possible routes to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping where possible routes to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the population and distribution of grey seal from being maintained or restored.</p>
<p>The extent and distribution of habitats of qualifying species are maintained The structure and function of the habitats of qualifying species are maintained The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent the supporting processes on</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
			<p>which grey seal rely on from being maintained or restored.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.397 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.6.5.398 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed in paragraphs 1.6.5.380 to 1.6.5.381. It is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.399 It is concluded that no adverse effects on the qualifying grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (see paragraphs 1.6.2.92 to 1.6.2.94) are discussed in Table 1.174. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.174: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the construction phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>As per paragraph 1.6.5.330, disturbance ranges of up to 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the</p>	<p>As per paragraph 1.6.5.336, disturbance ranges of up to as 7 km could potentially affect animals over regional scales. However, many vessels associated with the construction of the Morgan Generation Assets are likely to also be associated with the construction of the Transmission Assets and Morecambe Offshore Windfarm, and therefore in-combination vessel numbers will not be significantly higher than the Morgan Generation Assets alone.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>As per paragraphs 1.6.5.347 and 1.6.5.348, disturbance ranges such as 7 km could potentially affect animals over regional scales for Tier 1 projects in-combination with Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However, it should be noted that the assessments are based on the MDS, with the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping where possible routes to/from port.</p> <p>As per paragraph 1.6.5.353, the majority of Tier 2 projects are over 100 km from the Morgan Generation Assets, and as such, there is no potential for overlap in the behavioural ZoI. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes will follow existing shipping routes where possible to/from port.</p> <p>As per paragraph 1.6.5.361, vessel activity associated with Tier 3 projects is not anticipated to be higher than already assessed for Tier 1 or 2 projects or in Scenario 1 or 2.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>population and distribution of grey seal from being maintained or restored.</p>		<p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the population and distribution of grey seal from being maintained or restored.</p>
<p>The extent and distribution of habitats of qualifying species are maintained The structure and function of the habitats of qualifying species are maintained The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		supporting processes on which grey seal rely on from being maintained or restored.	not prevent the supporting processes on which grey seal rely on from being maintained or restored.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.400 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.6.5.401 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Report Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis. It is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.5.366 to 1.6.5.400 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.5.402 to 1.6.5.424.

West Wales Marine/Gorllewin Cymru Forol SAC

1.6.5.402 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.6.5.403 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.5.380 to 1.6.5.381), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.6.5.404 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Saltee Islands SAC

- 1.6.5.405 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC (paragraphs 1.6.5.380 to 1.6.5.381), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of underwater sound vessels and other activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

- 1.6.5.406 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Blasket Islands SAC

- 1.6.5.407 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Mers Celtiques – Talus du golfe de Gascogne SCI

- 1.6.5.408 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Abers – Côte des legends SCI

- 1.6.5.409 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Abers – Côte des legends SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Ouessant-Molène SCI

- 1.6.5.410 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

- 1.6.5.411 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

- 1.6.5.412 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Tregor Goëlo SCI

- 1.6.5.413 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Côtes de Crozon SCI

- 1.6.5.414 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Chaussée de Sein SCI

- 1.6.5.415 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cap Sizun SCI

- 1.6.5.416 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

- 1.6.5.417 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Vauville SCI

- 1.6.5.418 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

- 1.6.5.419 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

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Baie de Saint-Brieuc – Est SCI

- 1.6.5.420 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

- 1.6.5.421 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

- 1.6.5.422 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Estuaire de la Rance SCI

- 1.6.5.423 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

- 1.6.5.424 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.366 to 1.6.5.370), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to construction of the Morgan Generation Assets in-combination with other plans/projects.

Scenario 1: Morgan Generation Assets together with the Transmission Assets

Operations and maintenance phase

- 1.6.5.425 As presented for construction and decommissioning phases in paragraph 1.6.5.323, the risk of injury in terms of PTS to marine mammal receptors as a result of underwater sound due to vessel use and other non-piling sound producing activities at Morgan Generation Assets would be expected to be very low. As such, there is very low potential for in-combination effects for injury from elevated underwater sound due to vessel use and other (non-piling) sound producing activities. Instead, the in-combination assessment provided below focuses on disturbance only for this potential impact.
- 1.6.5.426 The operations/maintenance phase of the Morgan Generation Assets, together with operations/maintenance phase of the Transmission Assets may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.
- 1.6.5.427 The in-combination assessment for operations and maintenance phase and Scenario 1 follows the same approach as presented for construction and decommissioning phases in paragraph 1.6.5.326 et seq.). The Transmission Assets MDS identified up to 19 vessels on site at any one time and estimated the greatest modelled disturbance range for vessels at the Transmission Assets. The range of vessels used in operations/maintenance activities at the Transmission Assets will be similar to those employed during the construction phase.
- 1.6.5.428 The duration of vessel activity is considered to be long term (throughout the operations and maintenance phase of Morgan Generation Assets) and localised for each project; however, it should be noted that vessel movements will occur intermittently over the life time of the Morgan Generation Assets. The number of vessels present during the operations and maintenance phases of respective projects in isolation is considered to be smaller than for construction phase. Nevertheless, in-combination it could be expected that the total number of vessel movements will exceed the average traffic levels.
- 1.6.5.429 The in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects for Scenario 1 are therefore predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Scenario 2: Morgan Generation Assets together with the Transmission Assets and Morecambe Generation Assets

Operations and Maintenance Phase

- 1.6.5.430 The operations/maintenance phase of the Morgan Generation Assets, together with operations/maintenance phase of the Transmission Assets and Morecambe Offshore Wind Farm may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.
- 1.6.5.431 The in-combination assessment for operations/maintenance phase and Scenario 2 follows the same approach as presented for construction and decommissioning phases in paragraph 1.6.5.332 et seq.). The Morecambe Generation Assets MDS identified up to 10 vessels on site at any one time and estimated the greatest modelled disturbance range for vessels at the Transmission. The range of vessels used in

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operations and maintenance activities at the Transmission Assets will be similar to those employed during the construction phase.

- 1.6.5.432 The duration of vessel activity is considered to be long term (throughout the operations and maintenance phase of Morgan Generation Assets) and localised for each project; however, it should be noted that vessel movements will occur intermittently over the life time of the Morgan Generation Assets. The number of vessels present during the operations and maintenance phases of respective projects in isolation is considered to be smaller than for construction phase. Nevertheless, in-combination it could be expected that the total number of vessel movements will exceed the average traffic levels.
- 1.6.5.433 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects for Scenario 2 are predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Scenario 3: Morgan Generation Assets together with the Transmission Assets, Morecambe Generation Assets and all other relevant projects

Operations and Maintenance Phase

- 1.6.5.434 The in-combination assessment for operations and maintenance phase and Scenario 3 follows the same approach as presented for construction and decommissioning phases in paragraph 1.6.5.338 et seq.).

Tier 1

- 1.6.5.435 The operations and maintenance phase of the Morgan Generation Assets, together with operations and maintenance phase of the Transmission Assets, Morecambe Offshore Wind Farm and Tier 1 projects (Awel y Môr, Project Erebus, West Anglesey Demonstration Zone tidal site, Mona Offshore Wind Project, White Cross Offshore Windfarm and Twin Hub) may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities. The range of vessel used in operations and maintenance activities will be similar to those employed during the construction phase of in-combination projects although fewer vessels are likely to be involved but over a longer duration.
- 1.6.5.436 The MDS for the operations and maintenance phase of the Mona Offshore Wind Project assumes up to 21 operations and maintenance vessels on site at any one time and up to 849 vessel movements per year.
- 1.6.5.437 During the operation of Awel y Môr Offshore Wind Farm, it was anticipated that numerous different vessel types would be conducting round trips to and from port and the array area, but only two jack-up vessels and two SOVs would be present at any one time.
- 1.6.5.438 West Anglesey Demonstration Zone tidal site is located 73.9 km from the Morgan Generation Assets. The MDS for the project anticipated up to two drilling activities, two cable installation activities, two cable protection activities and 16 vessels on site (Morlais, 2019). The maximum predicated impact range for behavioural response across all species was predicted in harbour porpoise for two percussive drilling rigs and cutter-suction dredging as up to 530 m and 580 m, respectively.
- 1.6.5.439 The MDS for Project Erebus anticipated a maximum of two CTVs on site per day, which would be expected to be stationary or slow moving and were not expected to be a novel impact pathway for marine mammals in the area (Blue Gem Wind, 2020).

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- 1.6.5.440 The White Cross Offshore Wind Farm MDS identified up to five vessels on site at any one time during the construction phase, but no numbers were provided for the operations phase. However, the numbers of vessels involved in the operations and maintenance phase is likely to be lower than the construction phase.
- 1.6.5.441 Therefore, in-combination across the projects there will be an increase in vessel activity within the Celtic and Irish Seas regional area. This represents an uplift from the current baseline, although noting that the assessments are based on the MDS, the number of vessels present at respective projects at any given time will be lower in reality. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and will follow existing shipping routes where possible to/from port. As such, it would not be realistic to present a simplistic sum of all vessels anticipated within each offshore wind farm as per respective MDS. Introduction of vessels during construction and operations/maintenance phases of the projects will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of tolerance to vessel sounds.
- 1.6.5.442 The duration of vessel activity is considered to be long term (throughout the operations and maintenance phase of Morgan Generation Assets) and localised for each project with vessel movements occurring intermittently over the lifetime of the Morgan Generation Assets. The in-combination number of vessels will be lower for the operations and maintenance phases compared to construction phases of respective projects. Therefore, the magnitude of the impact for disturbance as a result of elevated underwater sound due to vessel use and other activities, for all marine mammal receptors, is expected to be less than that assessed for the construction phase. However, considering that the duration of the effect will be longer, over the decadal operating lifetime of the project, a precautionary approach has been taken to include the operations and maintenance phase in the assessment.
- 1.6.5.443 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects during the operations and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Tier 2

- 1.6.5.444 The operations and maintenance phase of the Morgan Generation Assets, together with construction and operations and maintenance phases of the Transmission Assets, Morecambe Offshore Wind Farm and Tier 2 projects (Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park, Llŷr 1, Llŷr 2, Mooir Vannin Offshore Wind Farm, North Channel Wind 1, North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Offshore Wind Farm, Project Valorous, Shelmalere Offshore Wind Farm, Oriel Offshore Wind Farm, Simply Blue Emerald, Wind Project Ilen and North Celtic Sea Offshore Wind Farm) may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities. The range of vessel used in operations and maintenance activities will be similar to those employed during the construction phase of in-combination projects although fewer vessels are likely to be involved but over a longer duration.
- 1.6.5.445 Given that EIA Scoping Reports for the projects outlined in paragraph 1.6.5.444 do not provide detailed information about numbers of vessels involved, it is not possible to undertake full, quantitative assessment for this impact.

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- 1.6.5.446 The range of vessels used in operations and maintenance activities will be similar to those employed during the construction phases of in-combination projects. The duration of vessel activity is considered to be long term (throughout the operations and maintenance phase of Morgan Generation Assets) and localised for each project; however, it should be noted that vessel movements will occur intermittently over the lifetime of the Morgan Generation Assets. The number of vessels present during the operations and maintenance phases of respective projects in isolation is considered to be smaller than for construction phase. Nevertheless, in-combination it could be expected that the total number of vessel movements will exceed the average traffic levels.
- 1.6.5.447 Qualitatively, the impact would lead to a larger area of disturbance within the Morgan regional marine mammal study area (see paragraph 1.6.5.441) compared to Morgan Generation Assets alone. Although animals may potentially be disturbed from isolated project areas at different points in time, in the context of the wider habitat available within the Celtic and Irish Seas regional area, the scale of the disturbance effects (which would be localised) is considered to be small.
- 1.6.5.448 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects during the operations/maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Tier 3

- 1.6.5.449 The operations/maintenance phase of the Morgan Generation Assets, together with construction and operations and maintenance phases of the Transmission Assets, Morecambe Offshore Wind Farm and Tier 3 projects (Blackwater Offshore Wind Farm, Braymore Point, Celtic Sea Array Offshore Wind Farm, Cork Offshore Wind Project, Clogher Head Offshore Wind Farm, Codling Wind Park Extension Offshore Wind Farm, Cooley Point Offshore Wind Farm, Eni Hynet CCS, Inis Offshore Wind Munster, Lir Offshore Array, MaresConnect, Project Saoirse, South Pembrokeshire Demonstration Zone and Spiorad na Mara Offshore Wind Project) may lead to in-combination effects of disturbance to marine mammals from vessel use and other (non-piling) sound producing activities. The range of vessel used in operations and maintenance activities will be similar to those employed during the construction phase of in-combination projects although fewer vessels are likely to be involved but over a longer duration.
- 1.6.5.450 Eni Hynet CCS, Lir Offshore Array and MaresConnect are located within 50 km of Morgan Generation Assets. All other Tier 3 projects (set out in paragraph 1.6.5.449; n = 10) are all located over 100 km away from the Morgan Generation Assets. Cable maintenance during the operations phase typically involves considerably smaller numbers of vessels and round trips compared to construction activities. Whilst this has the potential to increase vessel numbers in the Irish Sea this is not expected to be significantly larger than that already assessed for Morgan Generation Assets alongside Tier 1 and Tier 2 projects (see paragraph 1.6.5.338 and 1.6.5.350 respectively).
- 1.6.5.451 Whilst this has the potential to increase vessel numbers in the Irish Sea however this is not expected to be significantly larger than that already assessed for Morgan Generation Assets alongside Tier 1 and Tier 2 projects (see paragraph 1.6.5.435 and 1.6.5.444, respectively).

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1.6.5.452 Therefore, the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities leading to behavioural effects during the operations and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.6.5.453 There is potential for injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of activities associated with the Morgan Generation Assets during operations and maintenance, in-combination with activities associated with other projects/plans.

1.6.5.454 The potential for injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities is summarised for the construction period in paragraphs 1.6.5.363 to 1.6.5.365. The potential for from this impact leading to behavioural effects for Scenario 1, 2 and 3 is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact from these projects in-combination will not lead to any long-term effects on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conclusions

1.6.5.455 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.175. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.175: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site There is no significant disturbance of the species</p>	<p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	will not significantly disturb the harbour porpoise designated feature.	Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.	associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained	Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not hinder the condition of supporting habitats and processes or reduce the availability of prey.	As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

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1.6.5.456 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.6.5.457 The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.455 to 1.6.5.456. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.458 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the North Channel SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.12 to 1.6.2.14) is discussed in Table 1.176. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.176: Conclusions against the conservation objectives of the North Channel SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>The North Channel SAC is located at an increased distance to the Morgan Generation Assets (64 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not significantly disturb the harbour porpoise designated feature.</p>	<p>Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.</p>	<p>associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>

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1.6.5.459 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Channel SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.6.5.460 The potential for injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities is summarised for the construction period in paragraphs 1.6.5.371 to 1.6.5.372. The potential for from this impact leading to behavioural effects for Scenario 1, 2 and 3 is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact from these projects in combination will not lead to any long-term effects on the harbour seal feature of the Strangford Lough SAC.

Conclusions

1.6.5.461 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which undermine the conservation objectives of the Strangford Lough SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.19) is discussed in Table 1.177. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.177: Conclusions against the conservation objectives of the Strangford Lough SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>Maintain and enhance, as appropriate, the harbour seal population</p>	<p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		Morecambe Offshore Windfarm will not prevent the population of harbour seal from being maintained or enhanced.	Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the population of harbour seal from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site	Physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.	As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent physical features used by harbour seal within the site from being maintained or enhanced.	As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent physical features used by harbour seal within the site from being maintained or enhanced.

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1.6.5.462 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Strangford Lough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.6.5.463 The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC (94.7 km from the Morgan Array Area), assessed in paragraphs 1.6.5.461 to 1.6.5.462. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.464 It is concluded that no adverse effects on the qualifying Annex II harbour seal features which undermine the conservation objectives of the Murlough SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.24) is discussed in Table 1.178. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.178: Conclusions against the conservation objectives of the Murlough SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the harbour seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of harbour seal</p>	<p>The Murlough SAC is located at an increased distance to the Morgan Generation Assets (98.4 km from the Morgan Array Area) than the Strangford Lough SAC. As the Murlough SAC is located at an increased distance from the Morgan Generation Assets than the Strangford Lough SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Transmission Assets will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>Morecambe Offshore Windfarm will not prevent the population of harbour seal from being maintained or enhanced.</p>	<p>Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the population of harbour seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by harbour seal within the site</p>	<p>Physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, physical features used by harbour seal will not be affected by underwater sound given that there is no pathway for effects from vessels and other activities. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent physical features used by harbour seal within the site from being maintained or enhanced.</p>

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- 1.6.5.465 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Murlough SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in combination with other plans/projects.

Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC

Bottlenose dolphin and grey seal

- 1.6.5.466 The potential for injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities is summarised for the construction period in paragraphs 1.6.5.378 to 1.6.5.379. The potential for from this impact leading to behavioural effects for Scenario 1, 2 and 3 is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility. Therefore, this impact from these projects in combination will not lead to any long-term effects on the bottlenose dolphin or grey seal features of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC.

Conclusions

- 1.6.5.467 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin and grey seal features which undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC will occur as a result of in combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.34 to 1.6.2.36) is discussed in Table 1.179. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.179: Conclusions against the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not reduce nor likely reduce the natural</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the populations of bottlenose dolphin and grey seal from being maintained on a long-term basis as viable components of their natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	range of the populations of bottlenose dolphin or grey seal for the foreseeable future.	Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin or grey seal for the foreseeable future.	Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not reduce nor likely reduce the natural range of the populations of bottlenose dolphin or grey seal for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.	As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.	As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of bottlenose dolphin and grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin and grey seal.

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1.6.5.468 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lleyn Peninsula and the Sarnau/Pen Lleyn a'r Sarnau SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.6.5.469 The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed paragraphs in 1.6.5.467 to 1.6.5.468. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.470 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of The Maidens SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraph 1.6.2.55) is discussed in Table 1.180. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.180: Conclusions against the conservation objectives of The Maidens SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>To maintain (or restore where appropriate) the grey seal feature to favourable condition</p> <p>To maintain (and if feasible enhance) population numbers and distribution of grey seal</p>	<p>The Maidens SAC is located at an increased distance to the Morgan Generation Assets (142 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Maidens SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>	<p>Offshore Windfarm will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>	<p>Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the population and distribution of grey seal from being maintained or enhanced.</p>
<p>Maintain and enhance, as appropriate, physical features used by grey seal within the site</p>	<p>There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent physical features used by grey seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent physical features used by grey seal within the site from being maintained or enhanced.</p>	<p>As for Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the physical features used by grey seal within this site. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent physical features used by grey seal within the site from being maintained or enhanced.</p>

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1.6.5.471 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of The Maidens SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.6.5.472 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Lley Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from the Morgan Array Area), assessed paragraphs in 1.6.5.467 to 1.6.5.468. Therefore, it is considered that effects would be of similar if not lower magnitude.

Grey seal

1.6.5.473 As explained in paragraph 1.6.2.59 and in line with the iterative approach, the grey seal feature of the Cardigan Bay/Bae Ceredigion SAC is assessed below in paragraph 1.6.5.490.

Conclusions

1.6.5.474 It is concluded that no adverse effects on the qualifying Annex II bottlenose dolphin features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.61 to 1.6.2.65) is discussed in Table 1.181. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.181: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Morgan Generation Assets (188.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the populations of bottlenose dolphin from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, underwater sound as a result of vessels and other activities for Morgan Generation Assets in-combination with the Transmission Assets will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>	<p>with the Transmission Assets and Morecambe Offshore Windfarm will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, underwater sound as a result of vessels and other activities for Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>	<p>Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not adversely affect the population size, structure, production, and condition of bottlenose dolphin within the site. Finally, underwater sound as a result of vessels and other activities for Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2, and 3 projects will not reduce the natural range of the populations of bottlenose dolphin for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of bottlenose dolphin. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of bottlenose dolphin.</p>

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1.6.5.475 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.6.5.476 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed paragraphs in 1.6.5.467 to 1.6.5.468. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.477 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.71 to 1.6.2.74) is discussed in Table 1.182. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.182: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The population is maintaining itself on a long-term basis as a viable component of its natural habitat</p> <p>The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future</p>	<p>The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Morgan Generation Assets (237.3 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not reduce nor likely</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Asset, Morecambe Offshore Windfarm and the Tier 1, 2 and 3</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Generation Assets in-combination with the Transmission Assets will not prevent the population of grey seal from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not reduce nor likely reduce the natural range of the population of grey seal for the foreseeable future.</p>	<p>reduce the natural range of the population of grey seal for the foreseeable future.</p>	<p>projects will not reduce nor likely reduce the natural range of the population of grey seal for the foreseeable future.</p>
<p>The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing</p>	<p>There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of grey seal.</p>	<p>As per Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of grey seal.</p>	<p>As per Scenario 1, there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of grey seal. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the population of grey seal.</p>

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1.6.5.478 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.6.5.479 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC (28.2 km from Morgan Array Area), assessed in paragraphs 1.6.5.455 to 1.6.5.456. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.480 It is concluded that no adverse effects on the qualifying Annex II harbour porpoise features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.79 to 1.6.2.80) is discussed in Table 1.183. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.183: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p> <p>There is no significant disturbance of the species</p>	<p>The Bristol Channel Approaches SAC is located at an increased distance to the Morgan Generation Assets (300.5 km from the Morgan Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC. As the North Channel SAC is located at an increased distance from the Morgan Generation Assets than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not lower magnitude.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Assets in-combination with the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with other projects will not significantly disturb the harbour porpoise designated feature.</p>	<p>Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.</p>	<p>associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm, and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>Habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>	<p>As for Scenario 1, habitats and processes will not be affected by underwater sound given that there is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of harbour porpoise. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.481 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Lundy SAC

Grey seal

1.6.5.482 The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a'r Sarnau SAC (119.7 km from Morgan Array Area), assessed paragraphs in 1.6.5.467 to 1.6.5.468. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.483 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Lundy SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.85 to 1.6.2.87) is discussed in Table 1.184. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.184: Conclusions against the conservation objectives of the Lundy SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The Lundy SAC is located at an increased distance to the Morgan Generation Assets (335.1 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Lundy SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the population and distribution of grey seal from being maintained or restored.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The extent and distribution of habitats of qualifying species are maintained</p> <p>The structure and function of the habitats of qualifying species are maintained</p> <p>The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>population and distribution of grey seal from being maintained or restored.</p> <p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.6.5.484 It can therefore be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Lundy SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.6.5.485 The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (119.7 km from Morgan Array Area), assessed paragraphs in 1.6.5.467 to 1.6.5.468. Therefore, it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.6.5.486 It is concluded that no adverse effects on the qualifying Annex II grey seal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will occur as a result of in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance of the Morgan Generation Assets. An assessment of the potential impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities against each relevant conservation objective (as presented in paragraphs 1.6.2.92 to 1.6.2.94) is discussed in Table 1.185. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

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Table 1.185: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC from in-combination elevated underwater sound due to vessel use and other (non-piling) sound producing activities during the operations and maintenance phase.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The populations of qualifying species are maintained</p> <p>The distributions of qualifying species within the site are maintained</p>	<p>The Isles of Scilly Complex SAC is located at an increased distance to the Morgan Generation Assets (464.9 km from the Morgan Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. As the Isles of Scilly Complex SAC is located at an increased distance from the Morgan Generation Assets, it is considered that effects would be of similar if not lower magnitude than those described for the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC.</p> <p>Using the same approach for Scenario 1 in the construction and decommissioning phases (see paragraphs 1.6.5.326 to 1.6.5.331), the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets and the Transmission Assets.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the</p>	<p>Using the same approach for Scenario 2 in the construction and decommissioning phase (see paragraphs 1.6.5.332 to 1.6.5.337) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, and the Morecambe Offshore Windfarm.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the population and distribution of grey seal from being maintained or restored.</p>	<p>Using the same approach for Scenario 3 in the construction and decommissioning phase (see paragraphs 1.6.5.338 to 1.6.5.362) the in-combination impact of elevated underwater sound due to vessel use and other (non-piling) sound producing activities in the operation and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and of high reversibility for the Morgan Generation Assets, Transmission Assets, the Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects.</p> <p>Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the population and distribution of grey seal from being maintained or restored.</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
	<p>Transmission Assets will not prevent the population and distribution of grey seal from being maintained or restored.</p>		
<p>The extent and distribution of habitats of qualifying species are maintained The structure and function of the habitats of qualifying species are maintained The supporting processes on which the habitats of qualifying species rely are maintained</p>	<p>There is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>	<p>As for Scenario 1, there is no pathway for elevated underwater sound due to vessel use and other (non-piling) sound producing activities to result in adverse effects on the habitats of grey seal neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the extent, distribution, structure and function of the habitats of grey seal from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other (non-piling) sound producing activities associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and Tier 1, 2 and 3 projects will not prevent the supporting processes on which grey seal rely on from being maintained or restored.</p>

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1.6.5.487 Therefore, it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Isles of Scilly Complex SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.6.5.488 As outlined in paragraphs 1.6.1.3 to 1.6.1.9, following the iterative approach adopted for this HRA Stage 2 ISAA Part 2 – SAC assessments, the closest European site to the Morgan Generation Assets within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this HRA Stage 2 ISAA Part 2 – SAC assessments, are located at a greater distance from the Morgan Generation Assets and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.6.5.455 to 1.6.4.409 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.6.5.489 to 1.6.5.511.

West Wales Marine/Gorllewin Cymru Forol SAC

1.6.5.489 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.6.5.490 On the basis of the conclusions of the assessments presented for the grey seal features of the Llyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs in 1.6.5.467 to 1.6.5.468), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.6.5.491 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations

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and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Saltee Islands SAC

- 1.6.5.492 On the basis of the conclusions of the assessments presented for the grey seal features of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC (paragraphs in 1.6.5.467 to 1.6.5.468), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Saltee Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

- 1.6.5.493 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Blasket Islands SAC

- 1.6.5.494 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Blasket Islands SAC as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Mers Celtiques – Talus du golfe de Gascogne SCI

- 1.6.5.495 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Abers – Côte des legends SCI

- 1.6.5.496 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Abers – Côte des legends SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and

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maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Ouessant-Molène SCI

1.6.5.497 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Ouessant-Molène SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.6.5.498 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.6.5.499 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Tregor Goëlo SCI

1.6.5.500 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Tregor Goëlo SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Côtes de Crozon SCI

1.6.5.501 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Côtes de Crozon SCI as a result of elevated underwater sound due to vessel use and other

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(non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Chaussée de Sein SCI

1.6.5.502 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Chaussée de Sein SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Cap Sizun SCI

1.6.5.503 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cap Sizun SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.6.5.504 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Anse de Vauville SCI

1.6.5.505 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Anse de Vauville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.6.5.506 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and

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maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.6.5.507 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.6.5.508 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.6.5.509 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Estuaire de la Rance SCI

1.6.5.510 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Estuaire de la Rance SCI as a result of elevated underwater sound due to vessel use and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.6.5.511 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraphs 1.6.5.455 to 1.6.5.459), it can be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound due to vessel use

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and other (non-piling) sound producing activities with respect to the operations and maintenance of the Morgan Generation Assets in-combination with other plans/projects.

In-combination changes in fish and shellfish communities affecting prey availability

- 1.6.5.512 There is the potential for changes in Annex II marine mammal prey (e.g. fish species) abundance and distribution to arise as a result of construction activities of the Morgan Generation Assets in combination with the activities of the projects/plans in Table 1.125. Only the North Anglesey Marine/Gogledd Môn Forol SAC has been assessed within this section, as LSE from changes in fish and shellfish communities affecting prey availability was ruled out for all other European sites with Annex II marine mammal features.
- 1.6.5.513 These activities may physically disturb the seabed, result in increased SSC or generate underwater sound. Potential impacts to prey species may result in changes in the ability/success of marine mammals to forage in the area of the Morgan Generation Assets and other project areas. The risk of effects on prey species is expected to be greatest during the construction phase (e.g. due to seabed disturbance and/or underwater sound during construction). Impacts on fish species has been assessed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3).
- 1.6.5.514 Information regarding foraging behaviour of Annex II marine mammal species and their responses to changes of prey availabilities is discussed in paragraph 1.6.4.470. Whilst there may be some potential for in-combination effects to fish and shellfish communities, these effects will be highly localised and short term and therefore marine mammals are likely to be able to compensate and move to alternative foraging grounds.

Scenario 1: Morgan Generation Assets together with the Transmission Assets

Construction phase

- 1.6.5.515 The construction phase of the Morgan Generation Assets, together with construction phase of the Transmission Assets may lead to in-combination effects of changes in prey availability.
- 1.6.5.516 Total in-combination temporary habitat loss and disturbance was estimated to be up to up to 125.45 km². The total in-combination area of permanent hard structures has been assessed as up to 2.84 km² and equals to the long-term habitat loss. Colonisation of hard structures may commence within the four-year construction phase and continue into the operation and maintenance phase. Marine mammals are likely to benefit from locally increased food availability and/or shelter and therefore have the potential to be attracted to forage Morgan Array Area and Transmission Assets. Some increased foraging activities could benefit prey availability for marine mammals although this is unlikely to be at a scale that is measurable in terms of the populations within the wider region.
- 1.6.5.517 Temporarily overlapping construction activities at the Transmission Assets may result in increased SSC; however, these activities would be of limited spatial extent and frequency and are unlikely to interact with sediment plumes from the Morgan Generation Assets.

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- 1.6.5.518 Underwater sound from piling and UXO clearance associated with the construction phase of Morgan Generation Assets and Transmission Assets, have the potential to result in impacts to fish and shellfish receptors. For herring, there was overlap of 135 dB re 1 μ Pa (SPL_{pk}) contours with spawning grounds, and minor overlap of 160 dB re 1 μ Pa (SPL_{pk}) with low intensity spawning grounds. It is assumed that if herring are disturbed from an area as a result of underwater sound, marine mammals are likely to be disturbed from the same or greater area. However, whilst there may be certain prey species that make up the main part of their diet, all marine mammals in this assessment are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species.
- 1.6.5.519 The assessment provided in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) found that temporary habitat loss/disturbance, long term habitat loss and colonisation of hard structures, increased SSC and associated sediment deposition, underwater sound impacting fish and shellfish receptors and EMF from subsea electrical cabling in-combination with Transmission Assets are unlikely to result in changes in fish and shellfish communities affecting prey availability in marine mammals.
- 1.6.5.520 These localised and temporary changes in fish and shellfish communities affecting prey availability are considered in the context of the wider foraging habitat available for marine mammals. Therefore, the in-combination impact of changes in prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility.

Scenario 2: Morgan Generation Assets together with the Transmission Assets and Morecambe Generation Assets

Construction phase

- 1.6.5.521 The construction phase of the Morgan Generation Assets, together with construction phase of the Transmission Assets and Morecambe Generation Assets may lead to in-combination effects of changes in fish and shellfish communities affecting prey availability.
- 1.6.5.522 Total temporary habitat loss and disturbance in-combination with Morecambe Generation Assets was assessed as up to 128.91 km². Total in-combination area of permanent hard structures (equating to long term habitat loss) was estimated as up to 3.29 km². Colonisation of hard structures may commence within the four-year construction phase and continue into the operation and maintenance phase. Marine mammals are likely to benefit from locally increased food availability and/or shelter and therefore have the potential to be attracted to forage Morgan Array Area and Morgan Generation Assets. Some increased foraging activities could benefit prey availability for marine mammals although this is unlikely to be at a scale that is measurable in terms of the populations within the wider region.
- 1.6.5.523 For all other impacts considered in the in-combination scenario of Morgan Generation Assets alongside Transmission Assets and Morecambe Generation Assets, the assessment is as per Scenario 1 (see paragraph 1.6.5.515).
- 1.6.5.524 The assessment provided in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) found that temporary habitat loss/disturbance, long term habitat loss and colonisation of hard structures, increased SSC and associated sediment deposition, underwater sound impacting fish and shellfish receptors and EMF from subsea electrical cabling in-combination with

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Morecambe Generation Assets are unlikely to result in changes in fish and shellfish communities affecting prey availability in marine mammals.

- 1.6.5.525 These localised and temporary changes in fish and shellfish communities affecting prey availability are considered in the context of the wider foraging habitat available for marine mammals. Therefore, the in-combination impact of changes in fish and shellfish communities affecting prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility.

Scenario 3: Morgan Generation Assets together with the Transmission Assets, Morecambe Generation Assets and all other relevant projects

Construction phase

Tier 1

- 1.6.5.526 The construction phase of the Morgan Generation Assets, together with construction phase of the Transmission Assets, Morecambe Generation Assets and Tier 1 projects (offshore wind farms, dredging activities, aggregate extraction activities and cables and pipelines as per the Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) may lead to in-combination effects of changes in fish and shellfish communities affecting prey availability.
- 1.6.5.527 Potential in-combination impacts from Tier 1 projects on marine mammal prey species during the construction phase of the Morgan Generation Assets include temporary subtidal habitat loss, long term subtidal habitat loss, injury and disturbance from underwater sound, increased SSC and associated sediment deposition and colonisation of hard structures.
- 1.6.5.528 The construction of Tier 1 projects together with Morgan Generation Assets may result in the in-combination temporary habitat loss and disturbance of up to 136.17 km². Additionally, the planned construction of the Tier 1 projects alongside Morgan Generation Assets will introduce up to 4.39 km² of hard structures which will act to represent a combined long term habitat loss impact. This will act alongside the 1.79 km² of hard structures introduced by the Morgan Generation Assets to represent a potential in-combination long term habitat loss of up to approximately 5.54 km². Given that the construction phase will take place over four years, colonisation of hard structures may commence within that period and continue throughout the operations and maintenance phase. Potential adverse/beneficial effects on fish and shellfish would be localised due to the relatively small area of new hard structures introduced during this phase. Marine mammals are likely to benefit from locally increased food availability and/or shelter and therefore have the potential to be attracted to forage within Tier 1 offshore wind project array areas. Some increased foraging activities could benefit prey availability for marine mammals although this is unlikely to be at a scale that is measurable in terms of the populations within the wider region.
- 1.6.5.529 The construction phase of the Awel y Môr Offshore Wind Farm will have temporal and spatial overlap with the Morgan Generation Assets in terms of construction sound and may impact fish and shellfish. During piling at the Awel y Môr Offshore Wind Farm mortality for group 2 (salmonids and some Scombridae) and 3 (gadoids and eels) fish may occur out to 100 m and 8,000 m, from the Morgan Array Area respectively. However, sound modelling with inclusion of moving away response, significantly reduced mortality distances to less than 100 m for all groups. The Awel y Môr Offshore Wind Farm indicated behavioural effects to similar ranges as those predicted for the

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Morgan Generation Assets, at a range of approximately up to tens of kilometres from the piling location at the maximum hammer energies. Given that the in-combination impact will be taking place at distance from herring spawning grounds and due to the short term, intermittent nature of the impact, significant in-combination effects are not predicted to any of fish and shellfish species. Since in-combination effects of underwater sound from piling may also lead to changes in the distribution of marine mammals, it is likely that marine mammals will be displaced from the same or greater area as for their prey species.

- 1.6.5.530 Seabed preparation and installation of foundations and cables for the Morgan Generation Assets alongside Tier 1 projects may increase SSC and associated sediment deposition. As discussed in detail Volume 2, Chapter 3: Fish and shellfish of the Environmental Statement (Document Reference F2.3), resultant plumes from aggregate extraction or dredging would be advected on the tidal currents, travel in parallel, and not towards one another, and are unlikely to interact. Temporarily overlapping construction activities at Awel y Môr array area may result in increased SSC; however, these activities would be of limited spatial extent and frequency and are unlikely to interact with sediment plumes from the Morgan Generation Assets. The in-combination effect on fish and shellfish receptors as a result of SSC was assessed as unlikely to impact marine mammals.
- 1.6.5.531 For all other impacts considered in the in-combination scenario of Morgan Generation Assets alongside Transmission Assets and Morecambe Generation Assets, the assessment is as per Scenario 1 (see paragraph 1.6.5.515).
- 1.6.5.532 These localised and temporary changes in fish and shellfish communities affecting prey availability are considered in the context of the wider foraging habitat available for marine mammals. Therefore, the in-combination impact of changes in prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility.

Tier 2

- 1.6.5.533 The construction phase of the Morgan Generation Assets, together with construction phase of the Transmission Assets, Morecambe Generation Assets and Tier 2 projects (offshore wind farms, dredging activities, aggregate extraction activities and cables and pipelines as per the Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) may lead to in-combination effects of changes in fish and shellfish communities affecting prey availability.
- 1.6.5.534 Potential in-combination effects from Tier 2 projects on marine mammal prey species during the construction phase of the Morgan Generation Assets include temporary subtidal habitat loss, long term subtidal habitat loss, injury and disturbance from underwater sound, increased SSC and associated sediment deposition and colonisation of hard structures.
- 1.6.5.535 As assessed for Tier 1 project in paragraphs 1.6.5.527, with respect to indirect effects on marine mammals, no additional in-combination effects other than those assessed for injury and disturbance to marine mammals as a result of elevated underwater sound during piling are predicted. This is because if prey are disturbed from an area as a result of underwater sound, it is assumed that marine mammals are likely to be disturbed from the same or greater area, and so any changes to the distribution of prey resources would not affect marine mammals as they would already be disturbed from the same (or larger) area.

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- 1.6.5.536 For all other Tier 2 projects, EIA Scoping Reports do not provide sufficient detailed information to undertake a quantitative assessment. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) concluded that the in-combination magnitude of impact for marine mammals, as a result of changes in fish and shellfish communities affecting prey availability for Tier 2 projects is therefore not expected to differ from the in-combination assessment for Tier 1 projects.
- 1.6.5.537 These localised and temporary changes in fish and shellfish communities affecting prey availability are considered in the context of the wider foraging habitat available for marine mammals. Therefore, the in-combination impact of changes in prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility.

Tier 3

- 1.6.5.538 The construction phase of the Morgan Generation Assets, together with construction phase of the Transmission Assets, Morecambe Generation Assets and Tier 3 projects (offshore wind farms, dredging activities, aggregate extraction activities and cables and pipelines as per the Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) may lead to in-combination effects of changes in fish and shellfish communities affecting prey availability.
- 1.6.5.539 Potential in-combination effects from Tier 3 project on marine mammal prey species during the construction phase of the Morgan Generation Assets include temporary subtidal habitat loss, long term subtidal habitat loss, increased SSC and associated sediment deposition, colonisation of hard structures and EMFs from subsea electrical cabling.
- 1.6.5.540 The laying and burying of the MaresConnect Interconnector cable may involve introduction of cable protection (assumed as MDS) which will represent long term habitat loss and will likely follow standard jet trenching and cable protection installation, causing temporary habitat disturbance, although technical specifications will only be released at later development stages. Although no exact specifications are publicly available for the area for potential colonisation, it is expected that the cable protection will only represent a small increase of introduced hard structures and so will have only a minor in-combination impact. The likely jet trenching activities for the laying and burying of the cables for both projects will run concurrently and interaction of SSC plumes on spring tide events may occur. However, given the project is predicted to be operational in 2026, there is unlikely to be any overlap with Morgan Generation Assets construction phase and therefore there is a no potential for in-combination effects on marine mammal prey species.
- 1.6.5.541 These localised and temporary changes in prey availability are considered in the context of the wider foraging habitat available for marine mammals. Therefore, the potential in-combination impact of changes in prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility.

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Harbour porpoise

- 1.6.5.542 As presented for above for Scenario 1 (paragraphs 1.6.5.515 to 1.6.5.520), Scenario 2 (paragraphs 1.6.5.521 to 1.6.5.525) and Scenario 3 (paragraphs 1.6.5.526 to 1.6.5.541), any localised and temporary changes in prey availability are considered in

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the context of the wider foraging habitat available for marine mammals. Therefore, the potential in-combination impact of changes in prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility. Therefore, this impact from these projects in-combination will not lead to any long-term effects on the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conclusions

- 1.6.5.543 It is concluded that no adverse effects on the qualifying harbour porpoise features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will occur as a result of changes in fish and shellfish communities affecting prey availabilities during the construction and decommissioning phase of the Morgan Generation Assets in-combination with other projects and plans. An assessment of the potential impact of changes in fish and shellfish communities affecting prey availabilities against each relevant conservation objective (see paragraphs 1.6.2.12 to 1.6.2.14) are discussed in Table 1.186.

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Table 1.186: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination changes in fish and shellfish communities affecting prey availability.

Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>The species is a viable component of the site</p>	<p>Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. The harbour porpoise of this SAC prey on a wide variety of fish species and therefore are likely to be able to adapt to a minor shift in availability of some prey items. Harbour porpoise are known to forage over wide areas and exploit a range of prey species. Therefore, whilst there may be some potential in-combination effects to fish and shellfish communities, these effects will be highly localised and short term and therefore marine mammals are likely to be able to compensate and move to alternative foraging grounds. In addition, the Morgan Generation Assets and Transmission Assets will have measures to further reduce the potential for in-combination effects on fish and shellfish communities affecting prey availability. Therefore, changes in prey availability associated with the Morgan Generation Assets in-combination the Transmission Assets will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site.</p>	<p>As for Scenario 1, any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. The harbour porpoise of this SAC prey on a wide variety of fish species and therefore are likely to be able to adapt to a minor shift in availability of some prey items. Harbour porpoise are known to forage over wide areas and exploit a range of prey species. Therefore, whilst there may be some potential in-combination effects to fish and shellfish communities, these effects will be highly localised and short term and therefore marine mammals are likely to be able to compensate and move to alternative foraging grounds. In addition, the Morgan Generation Assets, Transmission Assets and Morecambe Offshore Windfarm will have measures to further reduce the potential for in-combination effects on fish and shellfish communities affecting prey availability. Therefore, changes in prey availability associated with the Morgan Generation Assets in-combination the Transmission Assets and Morecambe Offshore Windfarm will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site.</p>	<p>As for Scenario 1, any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. The harbour porpoise of this SAC prey on a wide variety of fish species and therefore are likely to be able to adapt to a minor shift in availability of some prey items. Harbour porpoise are known to forage over wide areas and exploit a range of prey species. Therefore, whilst there may be some potential in-combination effects to fish and shellfish communities, these effects will be highly localised and short term and therefore marine mammals are likely to be able to compensate and move to alternative foraging grounds. In addition, the Morgan Generation Assets/ Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will have measures to further reduce the potential for in-combination effects on fish and shellfish communities affecting prey availability. Therefore, changes in prey availability associated with the Morgan Generation Assets in-combination the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
<p>There is no significant disturbance of the species</p>	<p>Harbour porpoise may experience behavioural effects in response to change in prey availability in the vicinity of the Morgan Generation Assets and the Transmission Assets. However potential impacts to prey species are predicted to be localised, short term and intermittent, and harbour porpoise are expected to adapt and recover quickly. As such there is a negligible risk of disruption of foraging activities of harbour porpoise. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets in-combination with the Transmission Assets will not significantly disturb the harbour porpoise designated feature.</p>	<p>As for Scenario 1, harbour porpoise may experience behavioural effects in response to change in prey availability in the vicinity of the Morgan Generation Assets, the Transmission Assets and Morecambe Offshore Windfarm. However potential impacts to prey species are predicted to be localised, short term and intermittent, and harbour porpoise are expected to adapt and recover quickly. As such there is a negligible risk of disruption of foraging activities of harbour porpoise. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not significantly disturb the harbour porpoise designated feature.</p>	<p>porpoise will remain a viable component of the site.</p> <p>As for Scenario 1, harbour porpoise may experience behavioural effects in response to change in prey availability in the vicinity of the Morgan Generation Assets, the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects. However potential impacts to prey species are predicted to be localised, short term and intermittent, and harbour porpoise are expected to adapt and recover quickly. As such there is a negligible risk of disruption of foraging activities of harbour porpoise. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets in-combination with the Transmission Assets, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not significantly disturb the harbour porpoise designated feature.</p>
<p>The supporting habitats and processes relevant to harbour porpoises and their prey are maintained</p>	<p>There is no pathway for changes in prey availability to result in adverse effects on the habitats of harbour porpoise and there are no adverse effects expected for fish and shellfish species. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets in-combination with the Transmission Assets will not prevent the condition of habitats and their processes and the availability of prey from being maintained.</p>	<p>As for Scenario 1, there is no pathway for changes in prey availability to result in adverse effects on the habitats of harbour porpoise and there are no adverse effects expected for fish and shellfish species. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets in-combination with the Transmission Assets and Morecambe Offshore Windfarm will not prevent the condition of habitats and their processes</p>	<p>As for Scenario 1, there is no pathway for changes in prey availability to result in adverse effects on the habitats of harbour porpoise and there are no adverse effects expected for fish and shellfish species. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Morgan Generation Assets in-combination with the Transmission Asset, Morecambe Offshore Windfarm and the Tier 1, 2 and 3 projects will not prevent the condition of habitats</p>

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Conservation Objective	Scenario 1 Morgan Generation Assets + Transmission Assets	Scenario 2 Morgan Generation Assets + Transmission Assets + Morecambe Offshore Windfarm	Scenario 3 Morgan Generation Assets + Transmission Assets + Tier 1, Tier 2, Tier 3 projects
		and the availability of prey from being maintained.	and their processes and the availability of prey from being maintained.

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- 1.6.5.544 It can therefore be concluded beyond reasonable scientific doubt that there is **no risk of an adverse effect on the integrity** of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of changes in fish and shellfish communities affecting prey availability from the Morgan Generation Assets in-combination with other plans/projects.

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1.7 Summary

1.7.1 Effects on site integrity

- 1.7.1.1 Table 1.187 presents the conclusions of Adverse Effects on Integrity in relation to the Morgan Generation Assets alone and in-combination with other plans and projects.

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Table 1.187: Summary of conclusions.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
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Annex II diadromous fish species

River Ehen SAC	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Freshwater pearl mussel <i>Margaritifera margaritifera</i>	Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Dee Estuary/Aber Dyfrdwy SAC	Sea lamprey <i>Petromyzon marinus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	River lamprey <i>Lampetra fluviatilis</i>	Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Derwent and Bassenthwaite SAC	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Sea lamprey <i>Petromyzon marinus</i>	Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	River lamprey <i>Lampetra fluviatilis</i>				

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
River Kent SAC	Freshwater pearl mussel <i>Margaritifera margaritifera</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Solway Firth SAC	Sea lamprey <i>Petromyzon marinus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	River lamprey <i>Lampetra fluviatilis</i>	Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Bladnoch SAC	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid SAC	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
	Sea lamprey <i>Petromyzon marinus</i> River lamprey <i>Lampetra fluviatilis</i>	Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Afon Gywrfai a Llyn Cwellyn SAC	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Eden SAC	Atlantic salmon <i>Salmo salar</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Sea lamprey <i>Petromyzon marinus</i>	Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	River lamprey <i>Lampetra fluviatilis</i>	Construction/decommissioning	<ul style="list-style-type: none"> Underwater sound impacting fish and shellfish receptors In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> EMF from subsea electrical cabling In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
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Annex II marine mammals

North Anglesey Marine/Gogledd Môn Forol SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • Changes in fish and shellfish communities affecting prey availability (construction only) • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
North Channel SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Strangford Lough SAC	Harbour seal <i>Phoca vitulina</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Murlough SAC	Harbour seal <i>Phoca vitulina</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			vessel use and other (non-piling) sound producing activities <ul style="list-style-type: none"> In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC	Bottlenose dolphin <i>Tursiops truncatus</i> Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound during piling Injury and disturbance from elevated underwater sound during UXO clearance Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound due to 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			vessel use and other (non-piling) sound producing activities • In-combination effects.		
West Wales Marine/Gorllewin Cymru Forol SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
The Maidens SAC	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Cardigan Bay/Bae Ceredigion SAC	Bottlenose Dolphin <i>Tursiops truncatus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
		Operations and maintenance	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Pembrokeshire Marine/Sir Benfro Forol SAC	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound during piling Injury and disturbance from elevated underwater sound during UXO clearance Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
Bristol Channel Approaches SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Lundy SAC	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Isles of Scilly Complex SAC	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			vessel use and other (non-piling) sound producing activities • In-combination effects.		
		Operations and maintenance	• Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Rockabill to Dalkey Island SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	• Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Injury and disturbance from elevated underwater sound due to	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			vessel use and other (non-piling) sound producing activities • In-combination effects.		
Saltee Islands SAC	Grey seal <i>Halichoerus grypus</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Roaringwater Bay and Islands SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Blasket Islands SAC	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
			<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 		
		Operations and maintenance	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
17 French Sites	Harbour porpoise <i>Phocoena phocoena</i>	Construction/decommissioning	<ul style="list-style-type: none"> • Injury and disturbance from elevated underwater sound during piling • Injury and disturbance from elevated underwater sound during UXO clearance • Injury and disturbance from elevated underwater sound during pre-construction site investigation surveys • Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities • In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Morgan Generation Assets alone	Conclusion – Morgan Generation Assets in-combination with other plans and projects (including Scenario 1, 2 and 3)
		Operations and maintenance	<ul style="list-style-type: none"> Injury and disturbance from elevated underwater sound due to vessel use and other (non-piling) sound producing activities In-combination effects. 	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

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