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Morlais Tidal Array

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Classification

Executive Summary

Menter Môn Cyf (Menter Môn) is seeking a scoping opinion for the proposed Morlais Tidal Array (MTA) project, in accordance with the Transport and Works Act 1992 and the EIA Directive 2011/92/EU as amended by 2014/52/EU.

Two earlier scoping reports have previously been submitted to Natural Resources Wales (NRW), the Marine Management Organisation (MMO) and the Isle of Anglesey County Council (IoACC) in support of earlier versions of the MTA project, and are now superseded as a result of further development in the project design. The proposed installed capacity of the project has been increased in response to industry demand, and the Project is now seeking consent for an array of up to 240MW capacity and associated supporting infrastructure.

This report is submitted for the purpose of seeking a scoping opinion from the Welsh Government and other consultees including NRW, the MMO and IoACC on the revised scope of the Project.

Comment is also sought and welcomed from other stakeholders with an interest in the proposed development.

After receipt of a scoping opinion, an Environmental Impact Assessment (EIA) will be undertaken. A single Environmental Statement (ES) will be submitted to support a consent application to the Welsh Government, which will include offshore and onshore project components. The ES will also be used to support an application for a Marine Licence under the Marine and Coastal Access Act 2009, which will also include both onshore and offshore components. The EIA process will be informed by the scoping opinion received in relation to this scoping report.

This scoping report has been produced by Royal HaskoningDHV and includes a description of the proposed development, description of baseline environment as currently understood and a description of the approach to the EIA.

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Acronyms

µm	Micrometre
°C	Degrees Celsius
ADCP	Acoustic Doppler Current Profiler
AfL	Agreement for Lease
AIS	Automatic Identification System
AONB	Area of Outstanding Natural Beauty
AoS	Area of Search
BAP	Biodiversity Action Plan
BC	Before Christ
BTO	British Trust for Ornithology
CAR	Controlled Activities Regulations
CCW	Countryside Council for Wales
CIA	Cumulative Impact Assessment
CION	Connection and Infrastructure Options Note
CO_2	Carbon dioxide
COWRIE	Collaborative Offshore Wind Research into the Environment
cSAC	Candidate Special Area of Conservation
CSEMP	Clean Seas Environmental Monitoring Programme
DECC	Department for Energy and Climate Change
DIO	Defence Infrastructure Organisation
DP	Dynamic Positioning
EIA	Environmental Impact Assessment
EMF	Electro-magnetic field
EPS	European Protected Species
ES	Environmental Statement
ESAS	European Seabirds at Sea
EU	European Union
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicles
HIA	Heritage Impact Assessment
HMHC	Holyhead Mountain Heritage Coast
HRA	Habitats Regulations Assessment
IoACC	Isle of Anglesey County Council
JNCC	The Joint Nature Conservation Committee
km	Kilometre

kV	Kilovolts
LGDU	Local Government Data Unit
m/s	Metres per second
m^2	Metres Square
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
MCAA	Marine and Coastal Access Act
MCZ	Marine Conservation Zone
MDZ	Morlais Demonstration Zone
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MoD	Ministry of Defence
MPA	Marine Protected Area
MPS	Marine Policy Statement
MSFD	Marine Strategy Framework Directive
MSPD	Marine Spatial Planning Directive
MTA	Morlais Tidal Array
MW	Mega Watt
NERC	Natural Environment and Rural Communities
NGET	National Grid Electric Transmission
NNR	National Nature Reserve
NO_2	Nitrogen dioxide
NRA	Navigational Risk Assessment
NRW	Natural Resources Wales
NPS	National Policy Statement
NSP	Noise Sensitive Properties
O&M	Operations and Maintenance
OS	Ordnance Survey
PAC	Pre-application Consultation
PAM	Passive Acoustic Monitoring
PDE	Project Design Envelope
PEI	Preliminary Environmental Information
PEIR	Preliminary Environmental Information Report
PPG	Pollution Prevention Guidelines
PTEC	Perpetuus Tidal Energy Centre
RAF	Royal Air Force

RCAHMW	Royal Commission on Ancient and Historical Monuments of Wales
RES	Renewable Energy Strategy
RoRo	Roll-On Roll-Off (vessel)
RNLI	Royal National Lifeboat Institution
RSPB	Royal Society for the Protection of Birds
RYA	Royal Yachting Association
SAC	Special Area of Conservation
SAR	Search and Rescue
SCA	Seascape Character Assessment
SCI	Site of Community Importance
SEACAMS	Sustainable Expansion of the Applied Coastal and Marine Sectors
SLVIA	Seascape and Landscape Visual Impact Assessment
SPA	Special Protected Area
SPEN	Scottish Power Energy Networks
SSSI	Site of Special Scientific Interest
TAN	Technical Advice Note
TCE	The Crown Estate
TCPA	Town and Country Planning Act
TEC	Tidal Energy Converter
TIA	Traffic Impact Assessment
TSS	Traffic Separation Scheme
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organisation
V	Volts
WADZ	West of Anglesey Demonstration Zone (Morlais Demonstration Zone)
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WNMP	Welsh National Marine Plan
WSI	Written Scheme of Investigation

Glossary

Device	This is a term used to refer to one unit of tidal technology installation, and includes foundation and tidal energy converter.
Envelope	This refers to the Project Design Envelope which seeks to provide a flexible set of technology parameters, outlining worst case scenarios against which consent can be granted.
Menter Môn Cyf	Menter Môn
Morlais Demonstration Zone	The Project will be developed within the Morlais Demonstration Zone (MDZ) Agreement for Lease (AfL) area
MTA	This refers to the Morlais Tidal Array project and is used to describe the project both as a concept and as a built development.
Morlais Tidal Array	The Project
Offshore Scoping Area	The offshore scoping area includes the MDZ, plus the embayment identified for landfall (in the area of Penrhos Feilw, to the south of South Stack lighthouse). This is the area primarily used for scoping environmental interests although, for some receptors a wider search area was used, details of which are provided in individual sections. This area includes all areas where development may occur.
Onshore construction area	This refers to the footprint of the onshore construction works
Onshore scoping area	Menter Môn is considering several landfall locations, located in Penrhos Feilw. The onshore scoping area includes all areas being considered for landfall, substation locations and onshore cable route locations, including a cable route for a 132kV connection at Valley, a 132kV connection at the Orthios Holyhead Eco Park and a 33kV connection at Parc Cybi.
Rochdale Envelope	This refers to the Project Design Envelope which seeks to provide a flexible set of technology parameters, outlining realistic worst case scenarios against which consent can be granted.
Substation search area	Potential locations have been identified for the onshore substation location; however, final locations have not been determined.
TEC	This is a term used to refer to one unit of tidal technology installation, and includes foundation and tidal energy converter.
The Project	This refers to the Morlais Tidal Array project and is used to describe the project as a concept and as a built development.

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Appendices

1 Non-Technical Summary

1.1 The Morlais Tidal Array Project

Menter Môn Cyf (Menter Môn) proposes the development of 240MW of tidal generating capacity within the Morlais Demonstration Zone. Development of the Morlais Tidal Array (the Project) will support the objectives of the Anglesey and Gwynedd Joint Local Development Plan[1], aimed at promoting the development of renewable energy technology. The Project will prioritise maximising opportunities for local communities directly via employment and indirectly via the establishment of a local supply chain as far as necessary.

The development of the Project will provide a consented tidal technology demonstration zone, specifically designed for the installation, testing and commercial demonstration of arrays of tidal energy devices. The Project will include communal infrastructure for tidal technology developers which provides a joint route to a local grid connection location, such as export cables, an onshore substation and onshore electrical cable routes.

1.2 The Components

The consent application for the Project will include the following components:

- **Tidal energy devices**. The purpose of the Project will be to install multiple technology types within the MDZ, therefore the consent application will be based on a project design envelope (Rochdale Envelope), which will be determined through knowledge of existing technology and the direction of future developments;
- **Offshore electrical infrastructure**. Individual developers, depending on their devices, may need to construct offshore energy hubs as part of their array. In addition, there will be a need for offshore electrical hubs for the conversion of energy into an exportable format;
- **Offshore inter-array cables**. Inter-array cables will be used to connect individual devices within the array as well as connecting arrays to an offshore electrical hub. Developers will be responsible for connections to the offshore hub as cabling requirements may differ between technologies;
- **Offshore export cables**. These will be seabed installed cables between individual offshore electrical hubs and the landfall location;
- **Landfall and onshore cable route.** The landfall is expected to be at Penrhos Feilw, located to the south of South Stack lighthouse. The offshore cable will be brought a short distance onshore and will then be connected to an onshore cable within a transition pit. The onshore cable route will then join the offshore infrastructure with the onshore substation;
- **Onshore substation**. The location and design of the onshore substation has not been determined at this stage, although it is predicted that the substation will be located in the Penrhos Feilw area; and
- **Grid Connection**. There are three potential options for grid connection:
  - A 132kV connection at the Orthios Holyhead Eco Park, which is being developed on the former Anglesey Aluminium works at Penrhos;
  - A 33kV grid connection provided at Parc Cybi, near the former Anglesey Aluminium works; and
  - A 132kV grid connection at Valley.

[1] *Anglesey and Gwynedd Joint Local Development Plan (2017) http://www.anglesey.gov.uk/planning-and-waste/planning-policy/joint-local-development-plan-anglesey-and-gwynedd/*

1.3 Purpose of this Document

Two earlier scoping reports for the Project were previously submitted to Natural Resources Wales (NRW), the Marine Management Organisation (MMO) and the Isle of Anglesey County Council (IoACC) and are now superseded as a result of further development of the project design concept. This scoping report considers the onshore and offshore components of the Project and provides and therefore updates both previous scoping reports. The proposed installed capacity of the project has since been increased in response to industry demand, and the Project developer is now seeking consent for an array of up to 240MW installed capacity.

Development of the Project design has refined the landfall options and potential onshore cable route, allowing this scoping report to focus on a more discrete area for the infrastructure necessary for the Project. Ongoing refinement of the Project engineering design has narrowed the area of search for this scoping report to a preferred area for landfall, onshore substation locations and export cable route. This report is submitted for the purpose of seeking a scoping opinion from the Welsh Government and other consultees including NRW the MMO and the IoACC on the revised scope of the Project.

A single Environmental Statement (ES) will be submitted to support a consent application to the Welsh Government, which will include offshore and onshore project components. That ES will also be used to support an application for a Marine Licence which will also include both onshore and offshore components. The EIA process will be informed by the scoping opinion received in relation to this scoping report.

1.4 Layout of this Document

This document is laid out as follows:

- Section 1: Non-Technical Summary (this section);
- Section 2: Introduction to the Project;
- Section 3: Key Policy and Planning Legislation;
- Section 4: Geographical Boundaries and Approach to EIA;
- Section 5: Project Description;
- Section 6: Proposed EIA Methodology;
- Section 7: Physical Environment;
- Section 8: Biological Environment;
- Section 9: Human Environment;
- Section 10: Cumulative Impacts and In-Combination Effects; and
- Section 11: Summary.

2 Introduction to the Project

2.1 Scoping Report

This document is the environmental scoping report for the Morlais Tidal Array (MTA) (the Project). The development of the Project seeks to establish Anglesey as a marine energy hub whilst adding value to the local community and economy. The Project will be developed within the Morlais Demonstration Zone (MDZ) Agreement for Lease (AfL) area (Figure 2-1).

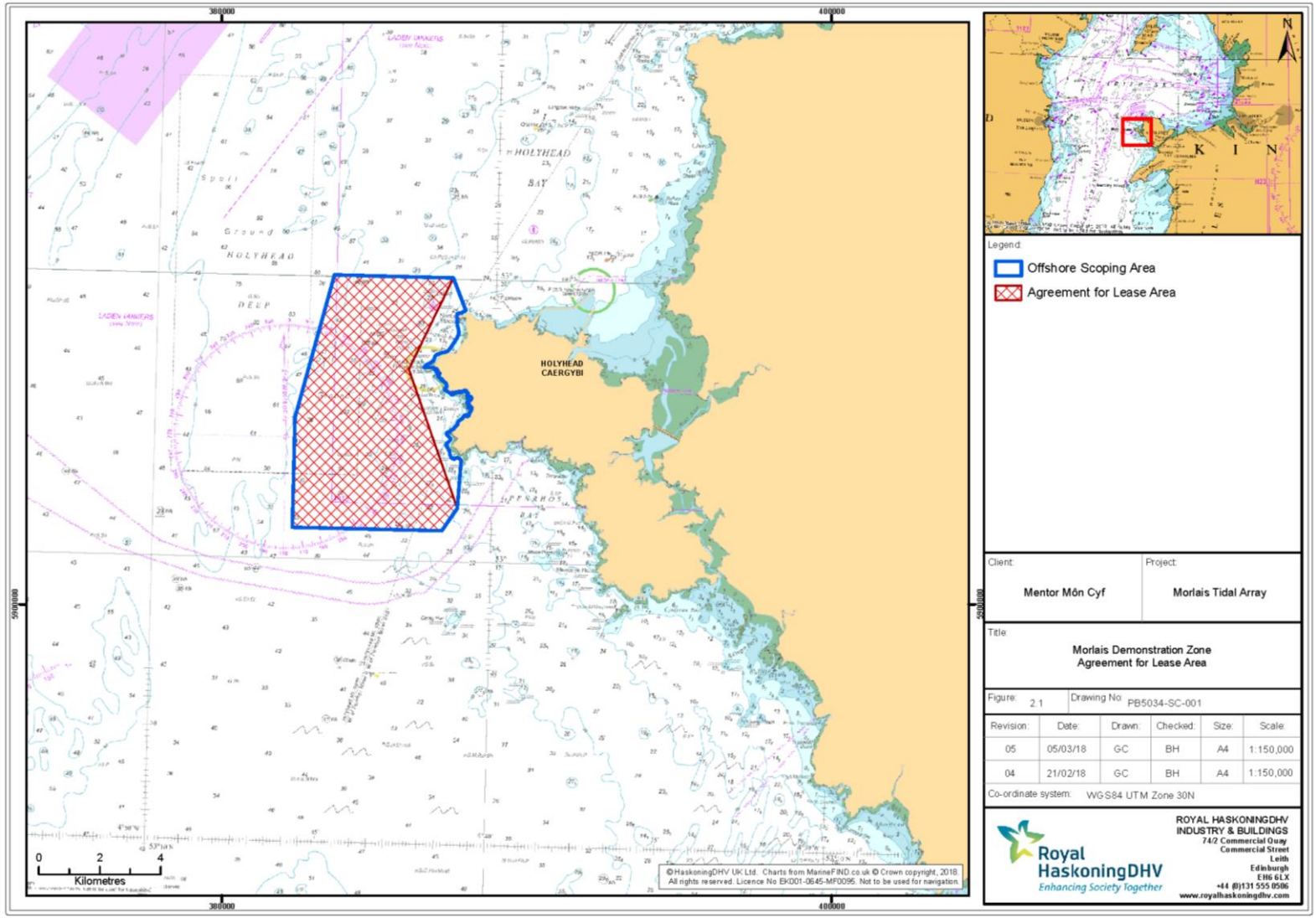


Figure 2-1 Morlais Demonstration Zone area

The aim of this scoping report is to communicate project information, identify data gaps and determine the potential environmental constraints and benefits associated with the construction, installation and operation of the Project, while taking account of comments already received in response to two previous scoping exercises.

Two earlier scoping reports relating to the Project have previously been submitted to NRW, the MMO and the IoACC in support of earlier versions of the Project. The proposed installed capacity of the project has since been increased in response to industry demand, and the Project is now seeking consent for an array of up to 240MW capacity and associated supporting infrastructure.

It is the intention that the supporting infrastructure of the Project will provide sufficient capacity to support grid connection of the Minesto Holyhead Deep project, located in Holyhead Deep, to the northwest of the offshore scoping area. However, the Minesto Holyhead Deep project does not form part of the Project and is the subject of a separate application for consents.

This scoping report represents an initial stage in the EIA process and is aimed at ensuring that all stakeholders are aware and informed of the scheme. Although consultees may be familiar with certain aspects of the Project from previous scoping reports, due to the changes to the scheme, a further scoping exercise is required.

2.2 The Developer

The Project Developer is Menter Môn. Menter Môn is a third sector social enterprise, delivering socioeconomic development projects across North Wales in various sectors. Menter Môn's motivation for the Project is to position itself as a community agency at the centre of renewable innovation, and to establish Anglesey as a marine energy hub, thereby securing maximum added value for the local economy and community.

Menter Môn has identified the following project objectives, which are ranked in order of their assessed importance:

1 Long term financial income / resources for reinvestment;

2 Development of locally based skills;

3 Attracting investment to the area;

4 Becoming a centre of excellence for such technologies;

5 Providing a world class facility for tidal energy development;

6 Preserving the environment; and

7 Securing a sustainable energy supply for the area.

2.3 Project Overview

2.3.1 Offshore Site Selection

An AfL for the development of the MDZ was obtained by Menter Môn from The Crown Estate in July 2014.

The MDZ is one of several areas around the United Kingdom for which an AfL has been awarded by The Crown Estate, with the purpose of encouraging and accelerating marine renewable technology development. Each of these areas was identified because it offers a viable wave and/or tidal energy resource and access to necessary infrastructure, including ports and electricity grid.

The MDZ covers an area of 35km^2 and is located approximately 0.5km at its nearest point from the west coast of Holy Island, Anglesey (Figure 2-1). Recent information on the tidal resources within the MDZ shows that tidal stream resource across the MDZ varies considerably, with the strongest tidal stream resource located in the east of the MDZ.

2.3.2 Onshore Site Selection

The export cable landfall is expected to be on the west coast of Holy Island, south of South Stack lighthouse, in the area of Penrhos Feilw.

The area between the landfall and the potential onshore substation location is largely open land, with some area of development and rough open ground. There are areas of ecological importance near the proposed landfall, which are discussed further in Section 8.6.

The current location of the substation has not been determined; however, an area within which the substation is expected to be located has been identified. A 500m buffer around the landfall and onshore substation locations and 300m buffer around the onshore cable routes has been included for the purposes of this scoping report.

2.3.3 Project Components

The Project will have an offshore and onshore component and will have a maximum generating capacity of 240MW. Tidal Energy Converter (TEC) devices will be installed offshore in a number of berths which will be designated across the site. The total potential number of TEC devices within the MDZ will be dependent on the individual generating capacity of the devices being installed. The energy generated from these devices will be exported to shore from each berth via a series of export cables, to a shared landfall and substation for onward transmission to grid.

2.3.3.1 Onshore

The onshore infrastructure for the Project will include the following components:

- **Landfall and onshore cable route.** The landfall is the point that the export cables come onshore and has been refined to the west coast of Holy Island in the area of Penrhos Feilw, an embayment to the south of South Stack lighthouse. Once on land, the export cables will be brought a short distance onshore and connected to onshore cable within a buried transition pit. The onshore cables will then join the offshore infrastructure with the onshore substation. For all onshore cable routes being considered, it is proposed that onshore cable routes will be installed within existing road or utilities networks to minimise the disturbance to currently undeveloped ground.
- **Onshore substation**. The location or requirements for onshore substation infrastructure is currently the subject of a front end engineering and design (FEED) study and has not been finalised at this stage. The design of the onshore substation has not been determined at this stage; however, it is the intention of Menter Môn to develop a structure that is sympathetic with the high quality landscape in the area and existing users. The onshore substation will convert power generated from TECs into an electrical format suitable for export to the grid connection. Figure 4-1 shows an overview of the onshore scoping area.
- **Grid Connection**. There are three potential options for grid connection:
  - A 132kV connection at the Orthios Holyhead Eco Park, which is being developed on the former Anglesey Aluminium works at Penrhos;
  - A 33kV grid connection provided by at Parc Cybi, near the former Anglesey Aluminium works; and
  - A 132kV grid connection at Valley.

The grid connection may also require the construction of a further substation or switching facility. SP Energy Networks or National Grid Plc will become the grid supplier and the grid connection point will be determined through the current FEED process for inclusion and assessment within the EIA.

Discussions with landowners are ongoing, therefore it is not possible to show specific locations for the cable route, landfall and substation location options at this stage. However, the search (scoping) area for the onshore component of the Project is identified in Section 4.2.1.1.

2.3.3.2 Offshore

The offshore infrastructure for the Project will include the following components:

- **Tidal energy devices**. The Project will install multiple technology types; therefore, the consent application will be based on the development of a project design envelope (sometimes referred to as the Rochdale Envelope), which will be determined through knowledge of existing technology, consideration of the direction of future developments and the outputs of FEED studies;
- **Offshore electrical infrastructure**. Individual developers, depending on their devices, may need to construct offshore energy hubs as part of their array. In addition, there will be a need for offshore electrical hubs for the conversion of energy into an exportable format;
- **Offshore inter-array cables**. Inter-array cables will be used to connect individual devices within the array as well as connecting arrays to an offshore electrical hub. Developers will be responsible for connections to the offshore hub as cabling requirements may differ between technologies; and
- **Offshore export cables**. A series of seabed installed cables will be laid between individual offshore electrical hubs and the landfall location. The eventual design will be informed by the FEED which is currently underway; however, it is anticipated that up to nine 33kV cables may be installed.

The search (scoping) area for the offshore component of the Project is identified in Section 4.2.1.2.

2.4 Consultation to Date

As previously discussed, scoping opinions were received in response to both previously submitted scoping reports. Comments received were logged (please see Appendix 1) and where applicable, these have been incorporated into this document.

In addition, meetings have been held with both NRW and the Royal Society for the Protection of Birds (RSPB) to discuss the Project, particularly in relation to ornithology survey requirements, data requirements for EIA and potential interactions with the South Stack Cliffs RSPB reserve. A summary of consultation to date is provided in Table 2-1.

Table 2-1 Consultation to date

Consultee	Date	Purpose of consultation
IoACC, NRW and MMO	12/01/15	Pre-scoping briefing meeting
RSPB	22/06/16	Introduction to the Project
RSPB and NRW	13/07/2016	Scope of works for ornithology and marine mammal surveys
Minesto	10/08/16	Potential collaboration between Morlais and Minesto
Welsh Fishermen's Association	17/08/16	Notification of the overall project and the commencement of offshore surveys (bird/mammals)
North Wales Fishermen's Co-operative Limited	17/08/16	Notification of the overall project and the commencement of offshore surveys (bird/mammals)

Consultee	Date	Purpose of consultation
IoACC	10/01/17	Scoping for onshore elements of the project under Electricity Works (Environmental Impact Assessment) England and Wales) Regulations 2000 (as amended) (please see Appendix 1). Formal scoping responses received from statutory consultees.
NRW	24/05/17	Progress with ornithological surveys
RSPB	24/05/17	Progress with ornithological surveys
Welsh Government (Planning Directorate), Welsh European Funding office (WEFO) and NRW	10/11/17	Project update, discussion of programme and consenting strategy
NRW	09/01/18	Consenting Strategy
NRW	17/01/18	Project Update
RSPB	24/01/18	Landfall Options at Penrhos Feilw
RSPB	25/01/18	Progress with ornithological surveys
Welsh Government (Planning Directorate), WEFO, NRW and The Crown Estate	15/02/18	Project update, discussion of programme and consenting strategy
Welsh Government (Planning Directorate) and the Planning Inspectorate	15/03/18	Project update, discussion of programme and consenting strategy

3 Key Policy and Planning Legislation

The following section outlines the main policy and planning legislation which will be applicable to the Project. A full review of applicable planning and policy will be undertaken during the EIA.

NRW provided feedback on relevant policy related to the project within their scoping opinion (SC1503). This has been taken into consideration within this section.

3.1 Climate Change and Renewable Energy Policy and Legislation

Climate change is one of the greatest environmental challenges facing the world today, with increasing pressure to reduce carbon emissions as a way of mitigating predicted increases in average global temperatures. As a result, climate change and reducing the rate of global warming is a key driver behind the continued development of the renewable energy industry.

The UK is currently a member of the European Union (EU) G8 and plays a leading role in tackling climate change at an international level. Whilst the UK remains within Europe, the UK is obliged to continue to meet its commitments to reducing climate change. Through the Kyoto Protocol (1997), the UK has a legally binding target to reduce emissions of greenhouse gases. The Climate Change Act formally commits the UK to reduce its carbon emissions by 80% by 2050, in line with commitments under the Kyoto Protocol. In order to achieve this, the UK Government sets carbon budgets to benchmark the reductions. Currently, carbon reduction targets are to reduce carbon emissions by 37% below 1990 levels in the period 2018-2022. The forward planning targets are for a 51% reduction (below 1990 levels) in greenhouse gases by 2025 and a 57% reduction by 2030[2].

Renewable energy is seen as a primary method of reducing emissions of greenhouse gases, in particular CO_2. The UK has entered into the EU Renewable Energy Directive (Directive 2009/28/EC)[3] to deliver national targets and priorities in greenhouse gas reductions as well as our domestic targets of reducing greenhouse gas emissions by 80% by 2050 (UK Marine Policy Statement, 2011)[4].

In addition to the reduction in greenhouse emissions, renewable energy is an important element in working towards a more varied energy mix and increased energy security to insulate the UK against global fluctuations in energy prices. Currently, renewable energy generation has been able to provide up to 24% of the UK's energy requirements during periods of optimum conditions. The renewable energy industry has also been an important economic driver helping to create direct and indirect jobs and benefit the wider economy.

Specific measures for renewable energy were set out in the UK Renewable Energy Strategy[5] (RES) which was published in parallel with the UK Low Carbon Transition Plan in July 2009[6].

The RES sets out the path by which the UK can meet the legally-binding target of 15% energy consumption from renewable sources by 2020. The UK interim target was for 5.4% of energy consumption to be provided by renewable energy by 2013. Preliminary calculations indicate that this target was met.

[2] *Committee on Climate Change: Carbon Budgets. https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/carbon-budgets-and-targets/ (accessed January 2018)*
[3] *EU Renewable Energy Directive. http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32009L0028 (accessed January 2018)*
[4] *UK Marine Policy Statement (2011). https://www.gov.uk/government/publications/uk-marine-policy-statement (accessed January 2018)*
[5] *The UK Renewable Energy Strategy (2009) https://www.gov.uk/government/publications/the-uk-renewable-energy-strategy (accessed January 2018)*
[6] *The UK Low Carbon Transition Plan (2009) https://www.gov.uk/government/publications/the-uk-low-carbon-transition-plan-national-strategy-for-climate-and-energy (accessed January 2018)*

The Renewable Energy Roadmap (DECC 2011[7], amended in DECC 2012[8] and DECC 2013[9]) updated some of the aims within the RES and identifies eight types of technology capable of providing 90% of the renewable energy required to meet the UK's 2020 target of 15% of energy consumption derived from renewable sources. It reports that energy from tidal stream devices could make a significant contribution to meeting the UK future energy needs.

Table 3-1 Summary of Relevant Climate Change Policies

Policy	Summary
United Nations Framework Convention on Climate Change (Paris climate agreement)	• Limit global temperature increase to below 2°C, while pursuing efforts to limit the increase to 1.5°C; • Commitments by all parties to prepare, communicate and maintain a Nationally Determined Contribution; and • In 2023 and every five years thereafter, a global stocktake will assess collective progress toward meeting the purpose of the Agreement.
European Union Renewable Energy Directive	• A reduction of 20% in greenhouse gases by 2020 (below 1990 levels); and • 20% of the total EU energy (electricity, heat and fuel) consumption to come from renewable sources by 2020.
The UK Climate Change Act 2008	• A reduction of 34% in greenhouse gases by 2020 (below 1990 levels); and • A reduction of 80% in greenhouse gases by 2050 (below 1990 levels).
The UK Energy Act 2013	• Introduction of provisions to enable a statutory 2030 decarbonisation target range for the GB electricity sector; and • Electricity Market Reform including introduction of the Contracts for Difference (CfDs) support mechanism.

3.1.1 Renewable Energy Policy Wales

Welsh renewable policy focuses on the transition to a low carbon energy system and maximising the benefits for both Wales and Welsh communities. The policy sets out the Welsh goals for providing an encouraging growth of renewable energy generation within the energy mix whilst ensuring development is pursued in a socially, environmentally and economically responsible manner that is compliant with the policies outlined in the Welsh Government resource management paper; Sustaining a Living Wales[10].

The 2012 Welsh Government policy document, Energy Wales: A Low Carbon Transition[11], updated in 2016, outlines the Welsh Government's approach to utilising the marine environment for renewable energy deployment. Marine renewable energy has been identified as a key way of meeting renewable energy objectives, with an aim to capture 10% of the potential tidal stream and wave energy off the Welsh Coastline by 2025.

[7] *UK Renewable Energy Roadmap (2011) https://www.gov.uk/government/publications/renewable-energy-roadmap (accessed January 2018)*
[8] *UK Renewable Energy Roadmap Update (2012). https://www.gov.uk/government/publications/uk-renewable-energy-roadmap-update (accessed January 2018)*
[9] *UK Renewable Energy Roadmap Update (2013). https://www.gov.uk/government/publications/uk-renewable-energy-roadmap-second-update (accessed January 2018)*
[10] *Sustaining a Living Wales (2012) www.cewales.org.uk/download_file/view/437/843/ (accessed January 2018)*
[11] *Energy Wales: A Low Carbon Transition (2012) http://gov.wales/topics/environmentcountryside/energy/energywales/?lang=en (accessed January 2018)*

The Welsh Government has outlined the Anglesey Energy Island Programme[12] which sets out to promote Anglesey as a hub for energy developments such as the Minesto Holyhead Deep project, Wylfa B nuclear power station and Holyhead Biomass Energy Centre. Through this, the Welsh Government is aiming to maximise socio-economic benefits to Anglesey and the wider area. The MDZ is being developed to maximise local socio-economic benefits where possible.

The Welsh First Minister has also set up the Energy Wales Unit, who's remit is to build on the policies set out in the 2012 Policy document and focus on progressing marine energy.

The Wellbeing of Future Generations (Wales) Act 2015 provides a mechanism for setting targets and reporting progress against indicators. Climate change is integral to the wellbeing goals, which recognise that the case for action on climate change is clear and fundamental to future prosperity and the future resilience of communities. Through its well-being objectives, the Act sets a clear agenda for sustainable development.

3.2 Planning Legislation

3.2.1 The Transport and Works Act 1992

The Transport and Works Act 1992 is used to authorise guided transport schemes and other types of infrastructure in England and Wales. Orders under the Transport and Works Act relate to transport systems, but also the construction and operation of works that interfere with rights of navigation in waters up to the limits of the territorial sea. As the Project will interfere with rights of navigation (Section 9.4), Menter Môn intend to apply to the Welsh Government for a Transport and Works Act Order.

3.2.2 Planning (Wales) Act 2015

The Planning (Wales) Act 2008 sets out the legislative changes to deliver reform of the planning system in Wales. The main objectives of the Act are to improve the existing planning process by producing a modernised framework for the delivery of planning services, strengthening the plan led approach, improving resilience, improving the development management system and enabling effective enforcement.

3.2.3 Wales Act 2017

The Wales Act 2017 introduces a new reserved powers model of devolution for Wales. The Act makes the National Assembly a permanent part of the UK's political framework. As a result, the National Assembly will be able to legislate on anything not reserved to the UK Parliament. The Act therefore devolves powers to the National Assembly and Welsh Government in areas including consenting for new energy projects. Although the Wales Act came into force in 2017, the majority of changes, including the reserved powers model, will not come into force until April 2019.

3.2.4 National Policy Statements

3.2.4.1 United Kingdom

The Marine Policy Statement (MPS) adopted by all UK administrations in March 2011 provides the policy framework for the preparation of marine plans and establishes how decisions affecting the marine area should be made in order to enable sustainable development.

[12] *Anglesey Energy Island Programme http://www.anglesey.gov.uk/business/energy-island-isle-of-anglesey-north-wales/key-project-facts/energy-island-programme/ (accessed January 2018)*

3.2.4.2 Wales

Planning policy for Wales is set out in the document Planning Policy Wales[13]. The planning policy document outlines the Welsh Government's approach to facilitating the delivery of the aims set out in Energy Wales: A Low Carbon Transition[14], as well as UK wide and European renewable energy targets, including obligations under the Renewable Energy Directive (2009/28/EC) [15].

The Planning Policy also takes into consideration meeting the aims of Sustaining a Living Wales document to ensure that development does not take precedent and impact on other factors.

The policy encourages a positive approach to the development of renewable and low carbon energy development and encourages collaboration where possible.

3.2.5 Marine Spatial Planning

The Maritime Spatial Planning Directive (EU Directive 2014/89)[16] (MSPD) has been in effect since September 2014. The Directive requires EU countries to draw up maritime spatial plans no later than 31st March 2012. These plans will enable public authorities to organise human activities in marine areas ensuring efficiency and sustainability of ecological, economic and social objectives.

The Welsh Government is currently developing the first marine plan for Welsh inshore and offshore waters, the Welsh National Marine Plan (WNMP)[17]. The Plan is being developed in accordance with the Marine and Coastal Access Act 2009 (MCAA)[18], the UK Marine Policy Statement (2011) and the Maritime Spatial Planning Directive.

Until the WNMP comes into act, the MCAA, MSP and MSPD will be adhered to. All public authorities are to take into account the MPS and relevant Marine Plans when making decisions in regard to the marine area. This ensures that marine resources are used in a sustainable way in line with the high level marine objectives.

3.2.6 The EIA Directive

EIA was introduced under the EU EIA Directive 85/337/EEC (as amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC) and the requirement to comply with them transposed into law by amendments to the Transport and Works Act 1992 and Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006. In 2011, the original EIA Directive and amendments were codified by EIA Directive 2011/92/EU (as amended by Directive 2014/52/EU).

Key changes which are of note relate to:

- A requirement to provide a description of the likely significant effects of the development on the environment resulting from impacts on climate change, risks to human health and use of natural resources;
- Ensuring EIA quality by requiring that those who undertake the work are competent experts;

[13] *Planning Policy Wales http://gov.wales/topics/planning/policy/ppw/?lang=en (accessed January 2018)*
[14] *Energy Wales: A Low Carbon Transition (2012) http://gov.wales/topics/environmentcountryside/energy/energywales/?lang=en (accessed January 2018)*
[15] *EU Renewable Energy Directive http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32009L0028 (accessed January 2018)*
[16] *Marine Spatial Planning Directive http://eur-lex.europa.eu/legal-content/EN/LSU/?uri=uriserv:OJ.L_.2014.257.01.0135.01.ENG (accessed January 2018)*
[17] *Welsh National Marine Plan http://gov.wales/topics/environmentcountryside/marineandfisheries/marine-planning/?lang=en (accessed January 2018)*
[18] *The Marine and Coastal Access Act http://www.legislation.gov.uk/ukpga/2009/23/contents (accessed January 2018)*

- More detailed demonstration of the consideration of reasonable alternatives to the proposed project; and
- Further consideration of how to avoid, prevent, reduce and / or off-set significant adverse effects where possible and develop monitoring strategies.

3.2.7 Habitats Regulations Assessment

Under the Habitats Regulations the Secretary of State must consider whether a plan or project has the potential to have an adverse effect on the integrity and features of a European site (i.e. a SAC, SPA, candidate SAC or Site of Community Importance (SCI)). This process is known as Habitat Regulations Assessment (HRA). Under the Habitats Regulations, Appropriate Assessment is required for a plan or project, which either alone or in combination with other plans or projects, is likely to have a significant effect on a European site and is not directly connected with or necessary for the management of the site.

HRA can be described as a four-stage process[19]:

- Stage 1: Screening is the process which initially identifies the likely impacts upon the interest features of a European site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts may be significant. It is important to note that the burden of evidence is to show, on the basis of objective information, that there will be no significant effect; if the effect may be significant, or is not known, that would trigger the need for an Appropriate Assessment;
- Stage 2: Appropriate Assessment is the detailed consideration of the impact on the integrity of the European site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's conservation objectives and its structure and function. This is to determine whether there is objective evidence that adverse effects on the integrity of the site can be excluded. This stage also includes the development of mitigation measures to avoid or reduce any possible impacts;
- Stage 3: Assessment of alternative solutions is the process which examines alternative ways of achieving the objectives of the project or plan that would avoid adverse impacts on the integrity of the European site, should avoidance or mitigation measures be unable to prevent adverse effects; and
- Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain. At Stage 4 an assessment is made as to whether or not the development is necessary for imperative reasons of overriding public interest and, if so, of the compensatory measures needed to maintain the overall coherence of the Natura 2000 network.

It is planned that HRA Screening will be undertaken for the Project and consulted upon with the relevant stakeholders. Further assessment will be undertaken as required and presented with the consent application in the information to support an Appropriate Assessment report. The information to support an Appropriate Assessment report will contain sufficient information to enable the competent authority to carry out an Appropriate Assessment should it determine that one is required.

3.2.8 Environmental Legislation

Table 3-2 provides a summary of other relevant environmental legislation, not covered in detail above.

Table 3-2 Summary of Key Environmental Legislation

Level	Legislation	Summary
International	The OSPAR Convention	• Establishes a network of Marine Protected Areas.

[19] *The Planning Inspectorate 2012 https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2012/10/Advice-note-10-HRA.pdf (accessed January 2018)*

Level	Legislation	Summary
International	The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	• Establishes Ramsar sites to protect important areas for waterfowl
European	The Convention on Biological Diversity	• Ensures the conservation of biological diversity, the sustainable use of the components of biological diversity and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.
European	Water Framework Directive (WFD) (2000/60/EEC)	• Ensures a 'good ecological status' of inland, estuarine and groundwater bodies including coastal surface waters up to one nautical mile offshore
European	Marine Strategy Framework Directive (MSFD) (2008/56/EC)	• Establishes measures to maintain or achieve 'good environmental status' in the marine environment.
European	Habitats Directive 92/43/EEC	• Provides a framework for the conservation and management of wild fauna and flora, including protection for specific habitats listed in Annex I and species listed in Annex II of the Directive. • Provides for the establishment of a Europe wide network of protected sites, known as Natura 2000 (the definition of which includes Special Areas of Conservation (SAC) and Special Protection Areas (SPA)).
European	Birds Directive (2009/147/EC)	• Provides a framework for the conservation and management of wild birds. • Establishment of a network of Special Protection Areas for rare or vulnerable species listed in Annex I of the Directive and for regularly occurring migratory species.
UK Legislation	Marine Coastal and Access Act 2009	• Enables the designation of Marine Conservation Zones (MCZs) in England, Wales and UK offshore waters. • Introduced measures including a streamlined marine licensing system and the introduction of a marine planning system and decision-making to enable sustainable development in accordance with the MPS. • All components of the project below Mean High Water Springs (MHWS) will require a Marine Licence issued by NRW.
UK Legislation	The Wildlife and Countryside Act 1981	• Enables the designation of SSSIs to provide protection for flora, fauna, geological and physio-geological features. • Enables designation of sites which are considered to be of national importance as National Nature Reserves (NNRs). • Makes it an offence to intentionally: kill, injure, or take wild birds and to take, damage or destroy the nest of any wild bird while that nest is in use or being built. • Makes it an offence to intentionally kill, injure or take any animal listed in Schedule 5 of the Act and protects occupied and unoccupied places used for shelter or protection.

Level	Legislation	Summary
		• Makes it an offence to intentionally pick, uproot or destroy any wild plant listed in Schedule 8 and to plant or otherwise cause to grow any non-native, invasive species listed under Schedule 9 of the Act.
UK Legislation	Conservation of Habitats and Species Regulations 2010 and Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007 (together the 'Habitats Regulations')	• Transposes the requirements of Habitats directive into UK law. • Makes it an offence to kill, injure, capture or disturb European Protected Species (EPS). • Note that these two sets of regulations are currently being consolidated; however, there will be no policy changes as a result of this exercise. • There is a potential for a Licence to disturb EPS to be required.
UK Legislation	Countryside and Rights of Way Act 2000	• Gives the power to designate Areas of Outstanding Natural Beauty (AONBs).
UK Legislation	Natural Environment and Rural Communities Act 2006 (NERC)	• Requires the relevant Secretary of State to compile a list of habitats and species of principal importance for the conservation of biodiversity.
UK Legislation	The Environment (Wales) Act 2016	• Replaces the Section 40 and Section 42 duty in the NERC Act 2006. • Enables the planning and management of Wales' natural resources in a more proactive, sustainable and joined-up way. • Provides Welsh Ministers with powers to put in place statutory emission reduction targets, including at least an 80% reduction in emissions by 2050 and carbon budgeting to support their delivery. • Improves waste management processes • Clarifies the law in relation to shellfisheries management and marine licensing and other environmental regulatory regimes including flood risk management and land drainage.
UK Legislation	The Commons Act 2006	• Protects areas of common land, in a sustainable manner delivering benefits for farming, public access and biodiversity.

4 Geographical Boundaries and Approach to EIA

This chapter defines the geographical and technical boundaries of the EIA along with the approach that Menter Môn plans to take with regards to site development and the implications of the EIA process.

4.1 Summary of Project Components to be included in the EIA

The components of the project which will be assessed in the EIA include:

- Onshore
  - Landfall works, including possible transition pits;
  - Cable installation from landfall to the onshore substation;
  - The onshore substation and associated infrastructure;
  - Grid connection cable route (between the onshore substation and grid connection substation); and
  - Grid connection substation.
- Offshore
  - Tidal devices, incorporating:
    - Foundation structures and associated support and access structures;
    - TECs; and
    - Seabed preparation measures for foundation construction (where necessary).
  - Offshore substation/hubs;
  - Site monitoring equipment;
  - Inter-array cables within each berth to connect tidal devices to one another and/or an electrical hub;
  - Surface floating navigation buoys; and
  - A subsea cable network, including:
    - Export cable(s) to shore end; and
    - Cable protection measures (where necessary).

4.2 Geographical Boundaries of Project Components

The Project will consist of several technological components.

All onshore development will occur within the onshore scoping area as shown in Figure 4-1. All offshore development will be undertaken within the offshore scoping area, as shown in Figure 4-2.

The project will include the following components (if required):

- Offshore tidal energy converter arrays, inter-array cables and offshore hubs;
- Export cable to shore and landfall area at Penrhos Feilw;
- Export cable landfall (the point where the offshore export cable corridor comes onshore) and possibly transition pit. Landfall will require sufficient space for multiple offshore export cables to be installed;
- Onshore cable (the onshore cable route between the landfall and the onshore substation);
- Onshore substation location; and
- Grid connection cable route (the cable route between the substation and the grid connection point).

An initial search of viable landfall and substation locations has identified a number of options for the location of the landfall, onshore substation and associated cable routes.

The landfall is expected to be at Penrhos Feilw, an embayment located to the south of South Stack lighthouse. The offshore cable will be brought a short distance onshore and will then be connected to an onshore cable within a transition pit. The onshore cable route will then join the offshore infrastructure with the onshore substation. The location of the onshore substation has not been determined at this stage, although it is predicted that the substation will be located landward (to the east) of Penrhos Feilw. From the onshore substation, an onshore cable would be routed to the grid connection location. There are three potential options for grid connection:

- A 132kV connection at the Orthios Holyhead Eco Park, which is being developed on the former Anglesey Aluminium works at Penrhos;
- A 33kV grid connection provided by at Parc Cybi, near the former Anglesey Aluminium works; and
- A 132kV grid connection at Valley.

4.2.1 Defining the Scoping Area

4.2.1.1 Onshore

The onshore scoping area has been developed to encompass all options being considered, including appropriate buffers around each location (minimum of 500m around landfall and onshore substation locations and 300m around onshore cable routes) (Figure 4-1). The buffers applied include all areas required for temporary construction.

The scoping area around the potential onshore infrastructure locations has been developed to identify sensitive receptors likely to be present within a distance of the development where they are likely to receive impacts. For most receptors, physical disturbance is likely to be a key consideration. Disturbance from noise is also likely to be a key consideration, particularly to ecology and human receptors.

As onshore construction works are likely to be restricted to the footprint of the substation and onshore cable routes, physical disturbance is anticipated to be localised. Presence of noise receptors and potential for visual disturbance is expected to differ considerably between locations; however, receptors within 500m of the substation are likely to be most impacted. The potential for impacts to occur beyond 500m will be considered within the EIA. Receptors are anticipated to be less sensitive to cable installation, which is why a 300m buffer was used for identifying sensitive receptors; however, the potential to impact on receptors further than 300m away will be considered in greater detail during the EIA.

Landowners are still being identified and the development of approach for landfall, substation and cable routes is ongoing through FEED studies. Therefore, at this stage it is not possible to specify precise locations for substation and the area has been enlarged to provide a ‘smoothed out’ area which covers all potential scenarios.

4.2.1.2 Offshore

The offshore scoping area follows the boundaries of the MDZ, as described in Section 2.3.1 (Figure 4-2).

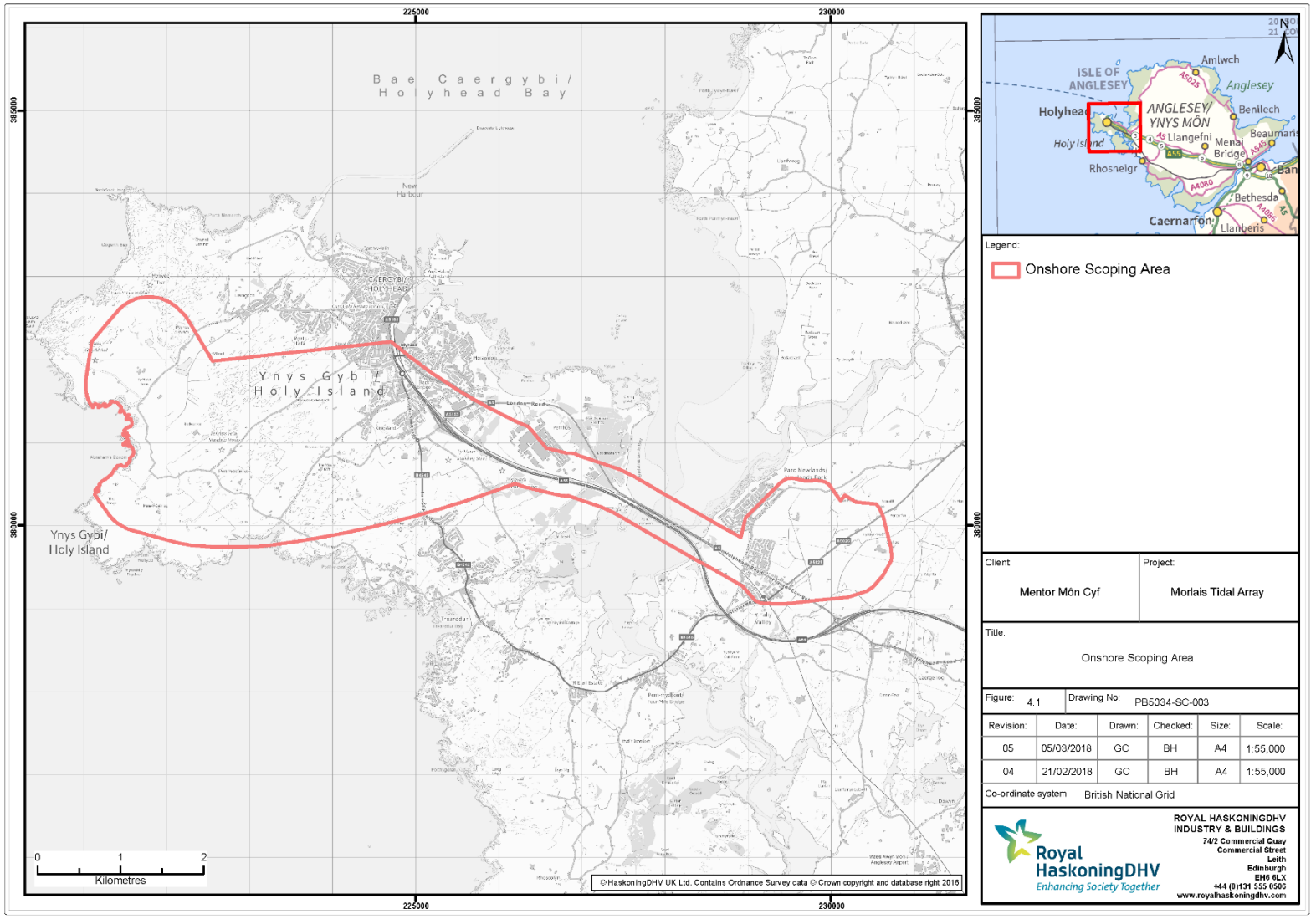


Figure 4-1 Onshore Scoping Area

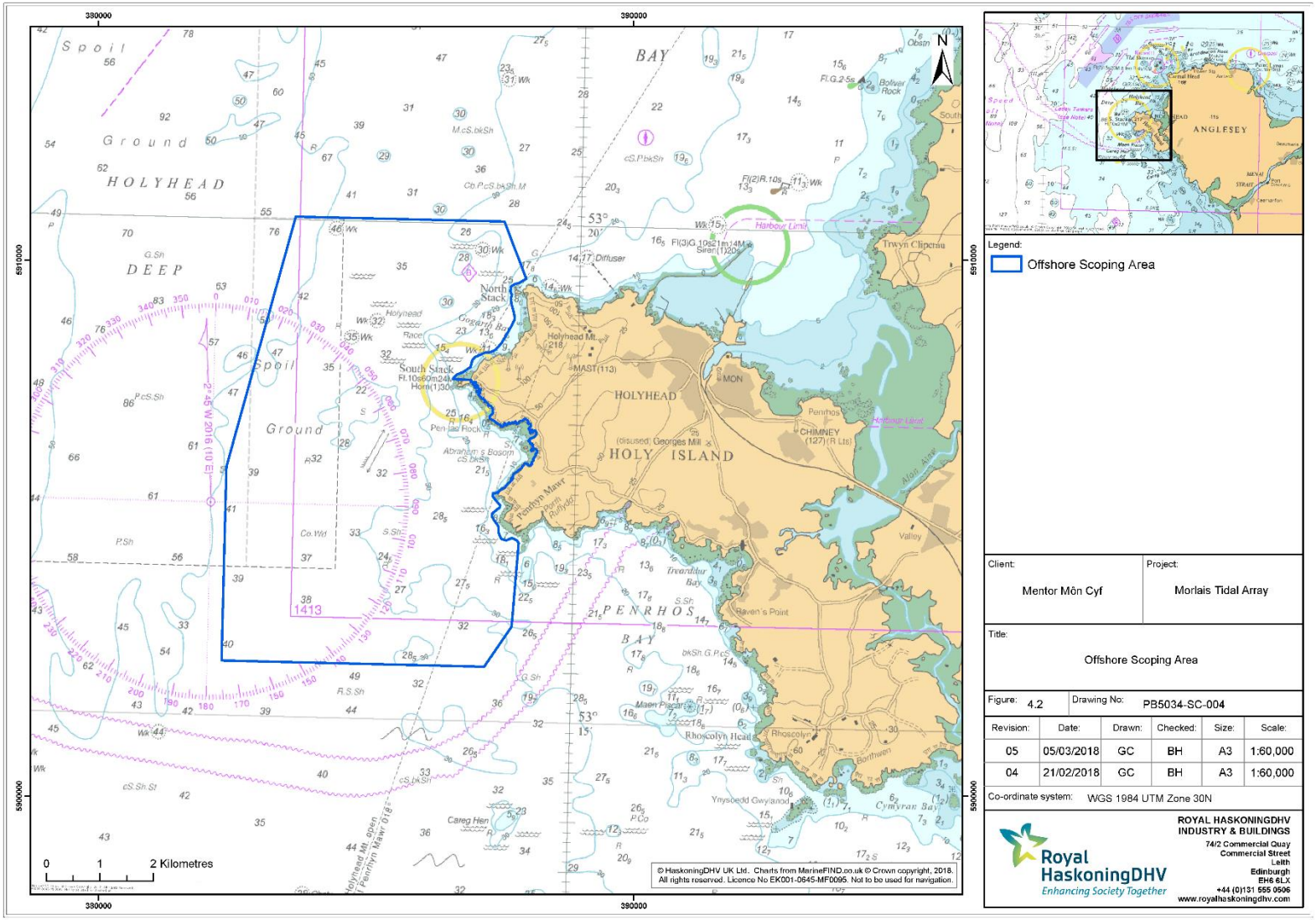


Figure 4-2 Offshore Scoping Area

4.3 Approach to EIA: Project Design Envelope

An essential element of any EIA is defining the project description against which impacts will be assessed. Engineering design works, as with most renewable projects, will be ongoing throughout the consenting phase and into the post-consent phase. Therefore, the EIA must be based on realistic worst-case scenarios and encompass a range of potential engineering options. This is typically done through the development of a Project Design Envelope (PDE), often called a Rochdale Envelope, which includes all likely potential engineering parameters that are being considered. The aim of the PDE is to provide a realistic description of the Project against which impacts are assessed, whilst retaining sufficient flexibility for the developer to account for uncertainties prior to detailed design.

The PDE approach is a process developed through planning case law and adopted for use in offshore renewable consenting, where there are often significant technological uncertainties during consent application. Flexibility is required within the consenting process to ensure that projects are assessed realistically, without unduly restricting engineering, before a full appraisal of appropriate technology can be undertaken.

The PDE approach seeks to provide consent for a set of parameters into which the final project will fall. It seeks to identify the maximum environmental impact based on the realistic worst-case scenario derived from the PDE.

The tidal sector is an emerging industry with a wide range of offshore technology types that are still being developed and optimised. The PDE approach is particularly important for projects such as the MTA, as it is likely that multiple types of devices will be installed at any one time. As a result, the offshore envelope may require sufficient breadth and flexibility to allow multiple technologies and infrastructure requirements. In contrast, the likely requirements for onshore infrastructure are relatively well understood, although detailed design work to define cable routes and substation dimensions will be an ongoing and developing process. The Infrastructure Planning Commission Advice Note Nine provides guidance on using of the PDE approach[20]. In addition, the Welsh Government hosted a workshop on defining the PDE for UK wave and tidal demonstration zones, based on maximum worst case-parameters[21]. During the EIA, the final design of onshore infrastructure such as specified cable routes and substation dimensions may not be completed prior to application submission; therefore, we would propose to use the PDE approach and associated guidance to assess impacts based on maximum worst-case parameters.

A PDE has been developed through discussions with potential tenants, a review of existing technologies and a review of the approach taken for other projects, for example, the recent Perpetuus Tidal Energy Centre (PTEC) project.

Our approach has been based on the definition of technical components. For each of these components, a maximum set of parameters will be identified and used during the EIA. These parameters may include for example:

- Onshore
  - Footprint of substation;
  - Height of substation;
  - Outer surface/finish of substation

[20] *Infrastructure Planning Commission (2011) Advice Note Nine: Rochdale Envelope https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2011/02/Advice-note-9.-Rochdale-envelope-web.pdf (accessed February 2018)*

[21] *UK Wave and Tidal Demonstration Zones Workshop Report: https://www.thecrownestate.co.uk/media/501992/ei-uk-wave-and-tidal-demonstration-zones-workshop.pdf (accessed February 2018)*

- Maximum cable corridor width;
- Maximum cable corridor length; and
- Maximum footprint of transition bay (if required).

- Offshore
  - Support structure footprint;
  - Swept area from generating devices;
  - Number of array cables;
  - Maximum cable corridor width;
  - Maximum cable corridor length;
  - Height above surface and depth below surface of floating devices and infrastructure; and
  - Height of seabed mounted infrastructure and devices.

The PDE will be used to define worst-case scenarios based on a consideration of those elements deemed to be most likely to result in the greatest impact on the receptor. The PDE will be designed to fully recognise the realistic worst-case scenario impacts to all receptors. The PDE will be defined by maximum anticipated parameters, most observable design elements, or potential significance of impacts on receptors. Whilst the above information provides a basic outline to parameters that will be considered, the PDE will be refined during the EIA process. The EIA will fully outline and define the PDE parameters used for assessing each receptor and a detailed description and justification of the PDE will be provided within the ES.

5 Project Description

The project is currently at a very early stage of development and much of the detail for the project is as yet unknown. The following section outlines the technology components that will be considered in the EIA.

5.1 Developing the Project Description

Menter Môn will seek a Transport and Works Act Order and Marine Licence for multiple devices and communal infrastructure based on the Rochdale Envelope approach (Section 4.3). This would include consent for the installation and operation of TEC arrays as well as the export of generated power to onshore infrastructure and eventually the Grid. The aim would be to provide an envelope based consent for TEC developers to install and demonstrate commercial scale TEC arrays within the MDZ.

Menter Môn will install communal infrastructure such as an offshore substation, export cable route and onshore infrastructure from the landfall to the onshore substation. Prospective tenants would be expected to install their own TEC arrays and install any infrastructure required to transmit generated power to a communal focal point (such as an offshore electrical hub).

Each deployment is likely to require an application for a licence to disturb EPS for both deployment and operation. This will be determined by the impact assessments for each EPS and will be discussed and agreed during consultation with NRW and the MMO.

The final location of tidal devices within the zone will be decided through an assessment of the devices needs, the availability of suitable locations within the MDZ and potential environmental, physical and human use constraints.

Specific array locations within the MDZ would be influenced by several environmental factors; with individual devices having specific requirements. Most devices require specific tidal resource and bathymetry and these factors are discussed further in Section 5.1.1 and Section 5.1.2. In addition to developmental considerations, the suitability of specific locations is likely to be influenced by stakeholder concerns and wider issues identified through the EIA process.

5.1.1 Resource

Within the MDZ there are a range of tidal conditions. Sufficiently strong tidal streams are required to ensure that a project is economically viable. In addition, the direction of flow, turbulence and ebb and flow ration need to be within the tolerance factors for the technology to be installed. Different technologies are anticipated to have different tolerances and requirements.

In consultation with Menter Môn, developers would be responsible for identifying a location that suits their technology. Tidal stream conditions and resource availability heavily influence project design, cost and payback; therefore, are a primary driving factor in influencing project locations.

5.1.2 Bathymetry

Water depths within the offshore scoping area vary between 32m and 56m. Water depth is an important consideration for location as this will have an influence on the most appropriate foundation, installation methodologies and cost of materials. Water depth will also have a large bearing on methods for device maintenance and any project design elements required for facilitating maintenance procedures.

5.1.3 Grid Connection Development

Several grid connection options are currently being considered, these are:

1 A 132kV option to connect to the network via the Orthios Holyhead Eco Park, which is being developed on the former Anglesey Aluminium works at Penrhos;

2 A 33kV connection through Scottish Power Energy Networks (SPEN) at Parc Cybi grid connection point; and

3 A 132kV connection through National Grid, near Valley.

Menter Môn will also plan for sufficient capacity within the onshore infrastructure and grid connection to support Minesto's Holyhead Deep project.

A review of cable route options from the substation locations being considered has highlighted a number of possible onshore routes that the grid connection cables could take in order to connect to the potential connection points. It is anticipated that the majority of the onshore cable would be laid underground, within or adjacent to existing road infrastructure. These cable routes are included within the onshore scoping area and will be refined based on the FEED studies and wider consultation.

5.2 Onshore Project Description

5.2.1 Cable Landfall

As outlined previously, the preferred offshore export cable landfall is in the area of Penrhos Feilw, on the west coast of Holy Island.

There are two main methods which could be used for cable installation at landfall:

- Open cut trenching; or
- Horizontal Directional Drilling (HDD).

Depending on the distance between the landfall and the chosen onshore substation a transition pit and separate onshore cable may or may not be required. For the purpose of this scoping report, it is assumed that a separate length of onshore cable will be required, joined to the offshore export cable near the landfall using a transition pit.

The final cable route and substation options will be refined and outlined within the EIA alongside a discussion of the alternative options that have been considered.

5.2.2 Onshore Cable Route

Onshore cable installation is typically undertaken by either plough, or by a trench and backfill method, depending on the soil type. Ploughing requires suitable (softer) soils and causes minimal disturbance. Installation of the cables through made ground, roads and harder soils is expected to require a trench to be excavated along the cable route, the cable is then placed within the trench and buried to a depth of no less than 1m below ground.

In areas where the cable route needs to cross obstacles such as major roads or water courses, the excavation of a trench may not be possible. In these areas HDD may be undertaken to install the cable without disturbing surface infrastructure.

It is proposed that cable routes will be installed within or adjacent to existing road infrastructure as far as possible. It is assumed that this would minimise the risk of potential impacts to ecological and unknown cultural heritage receptors.

5.2.3 Onshore Substation

Although details of the onshore substation are not fully specified at this stage, it is likely to consist of the following components:

- A compound with hardstanding which would house a grid transformer and connection terminations;
- A control building for housing switch gear; and
- A welfare area which would be likely to consist of a site office and welfare facilities including an area of hardstanding for parking.

The size of the substation will vary with the design chosen and method of cable entry. Substations from similar developments vary in size and capacity requirements. Other tidal projects have reported substation footprints of between 30m x 9m[22] and 70m x 50m[23], with numerous factors influencing the final footprint, such as:

- Whether an air or gas insulated substation is chosen as the final design. An air insulation based substation would be likely to have a larger final footprint than a gas insulated facility;
- The direction the cables enter the substation (vertically or horizontally);
- The requirement for reactive compensation equipment and harmonic filters; and
- The internal layout of the substation. Electrical equipment can be stacked to reduce the overall footprint of the substation but this would increase the overall height of the substation.

There are two general types of substation that govern the overall appearance of the structure, these include:

- A fully enclosed substation where the electrical components are contained within an external structure; or
- An outdoor substation where the electrical components are not contained within a structure, but will be within a fenced or otherwise secured and landscaped compound.

Substation location and design will be carefully considered, in order to reduce visual impacts as far as possible. The substation itself will be sympathetically designed.

5.2.4 Grid Connection Cable Route

The grid connection cable route will be refined once substation and grid connection locations are finalised. As far as possible, the final cable route from the substation to grid will be routed within the road, to minimise the potential for impacts to ecological or unknown archaeological receptors. Full details of potential connection routes and appropriate traffic management options will be presented within the EIA.

Grid connection routes from substation locations are likely to vary depending on the location; however, all routes would have short sections through unmade ground to connect substation locations and existing roads. The cable routes could be routed through rural areas to Parc Cybi along the following roads:

- South Stack Road;
- Lon Isallt;
- Plas Road;
- Porthdafarch Road; and

[22] *PTEC Environmental Impact Assessment. Perpetuus, 2014.*
[23] *Brims Tidal Array Environmental Scoping Report. Brims Tidal Array Ltd 2013.*

- Mill Road.

The grid connection route would then follow either the A55 and/or A5 to access connections at Orthios Holyhead Eco Park or Valley as required.

5.2.5 Access and Haulage Roads

During the onshore cable installation, temporary haulage roads for accessing the cable route may be required for construction vehicles and personnel to access the construction site, although this is only likely to be required where cables are being installed in unmade ground.

The number and extent of requirements for access roads will be dependent on the location of the substation and the final onshore cable route, strengthening of local roads to allow Heavy Goods Vehicles (HGV) to access the substation and cable route during construction may also be required. The requirements for road strengthening will be considered during the identification of the preferred substation and cable route option. Any requirements for road alterations will be outlined within the EIA and fully assessed as part of the traffic and transport and terrestrial ecology assessments.

Appropriate traffic management mitigation is expected to be required during cables installation within the road. Appropriate mitigation will be discussed with the IoACC as part of the EIA process.

5.3 Offshore Project Description

5.3.1 Technology Envelope

Menter Môn has undertaken a thorough review of the tidal industry and the current state of TEC technology to determine an inclusive design envelope based on:

- Initial discussions with prospective tenants to learn what technology they will be looking to test and their requirements for undertaking testing;
- A review of current tidal technology to determine what is currently being tested and what technology is currently under development and will require testing within the next 10 years; and
- A review of design envelopes used for scoping and EIA for similar projects, for example, the PTEC tidal demonstration project.

As a result of these discussions the PDE will be based around the following general principles:

- Deployed capacity may be up to, but will not exceed 240MW;
- Both horizontal and vertical axis turbines will be included;
- We will include surface floating technologies such as the Scotrenewables (http://www.scotrenewables.com/), Bluewater types (http://www.bluewater.com/), and Tidal Stream exemplars (http://www.tidalstream.co.uk/);
- We will include midwater technologies such as Plat-O (https://sustainablemarine.com/plat-o), but will not include technologies developed by Minesto;
- Large scale surface piecing, pile based technologies may not be included;
- We will include seabed mounted technologies, to include Delta Stream, OpenHydro, Hammerfest, HyTide etc;

- Drilled pile, gravity base and anchored foundation types will be included, but percussive pile foundations are unlikely to be appropriate given the hard substrata present within the MDZ and therefore will not be included; and
- Floating and surface piercing substations and hubs will be included.

5.3.2 Overview of Technology

5.3.2.1 Tidal Energy Converters

The following section provides an overview of progressing tidal technology and installation methods that will be included within the PDE.

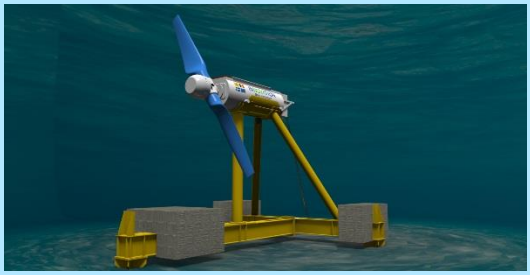
A number of representative tidal technologies will be considered in order to capture the likely range of TECs that may be deployed within the MDZ. Table 5-1 provides examples of devices that are currently in development and could be candidates for deployment at the MDZ.

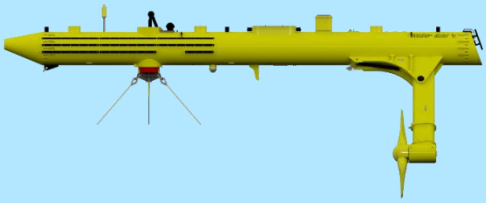
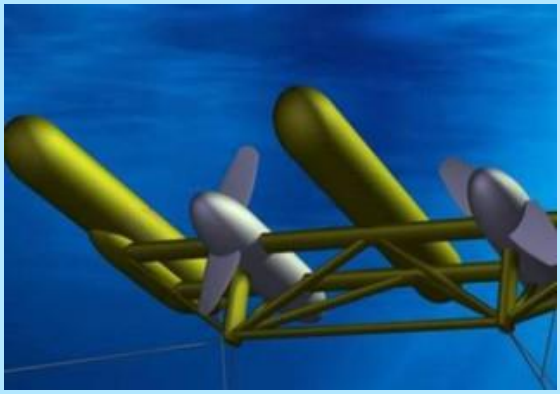
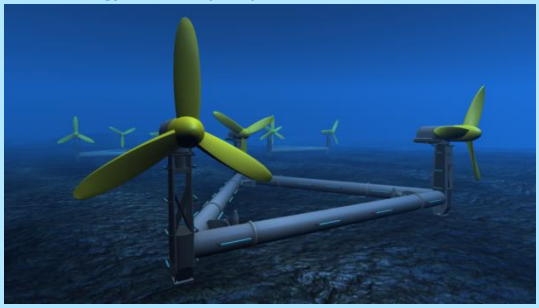
The maximum parameters associated with each device will be identified during the EIA in order to allow the worst-case scenario of the PDE to be assessed for each receptor. Key details that will be identified during the EIA include:

- Maximum number of each device;
- Height above the sea surface;
- Potential swing/movement of the device around the foundations;
- Surface clearance;
- Seabed clearance;
- Rotor diameter;
- Rotor RPM and tip speed;
- Foundation type; and
- Footprint on the seabed.

Table 5-1. Examples of Tidal Energy Converters (TEC) which could potentially form part of deployments at the MDZ

Device	Details
Andritz Hydro Hammerfest 	The Andritz Hydro Hammerfest device is a horizontal axis turbine, 3 blade rotor with full pitch control. The device is fully submerged on a gravity foundation. The turbine has a modular design, allowing all critical components to be lifted out of the water in one operation for maintenance and repair.
Atlantis AR series	The AR series turbines are commercial scale horizontal axis turbines designed for open ocean deployment. AR turbines feature a twin rotor set with fixed pitch blades.

Device	Details
	
Aquantis AQ Series 	The AQ series turbines are driven by an upstream rotor with variable pitch blades, with the rotor sweep well below the surface.
Instream Energy Systems Vertical Access Hydrokinetic Turbine (VAHT) 	The VAHT is a non-submerged hydrokinetic power solution consisting, applicable in both inland water and near-shore tidal applications.
Nova Innovation 30 and M100 Turbines 	The Nova M100 turbine is scalable and suitable for deployment in a range of deep water, estuarine and river environments.
Open Hydro Open Centre Turbine (OCT)	The Open Hydro device is an open centre turbine: a horizontal axis turbine with two counter rotating fixed pitch rotors and direct drive, with permanent magnetic DC rim generators. The turbine is designed to be deployed directly on the seabed, using a gravity foundation and a purpose build barge. The rotors are fabricated largely from glass reinforced composites.

Device	Details
	
Scotrenewables Tidal Turbine 	The Scotrenewables Tidal Turbine device is a floating device which has two horizontal axis turbines mounted beneath the surface on a floating hull platform. The turbine blades can be retracted beneath the hull for maintenance purposes. The platform is moored to the seabed via 4 seabed anchor points. A power and control umbilical line connects the device to control and grid.
SME Plat-O 	The SME Plat-O device is a mid-water column floating platform that allows multiple turbines to be mounted.
Tidal Energy Limited (TEL) – Delta Stream 	The DeltaStream device consists of an array of 3 horizontal axis rotors mounted on a frame/platform resting on the seabed. Three turbines on a single, circa 30m wide, triangular frame have a low centre of gravity giving structural stability.
Tidal Stream Ltd Triton	The Triton device is a low lying, surface piercing device with a buoyant superstructure attached to seabed, with monopile, pin piles or gravity structure utilising mooring lines or a rigid structure. Can support multiple TECs on a single platform.

Device	Details
	
Verdant Isles Kinetic Hydropower System (KHPS) 	Verdant Power's KHPS incorporates turbines with open three-bladed rotors installed fully under water. The turbine is designed to self-rotate into the prevailing current so that the blades are optimally aligned to generate energy.

5.3.2.2 Foundation Types

Seabed Mounted Devices

Seabed mounted devices can be fixed using several different methods. For example, TECs can be mounted directly onto monopiles, or mounted on jacketed foundations that are pinned using pin piles (e.g. Open Hydro; Table 5-1). Piling methods are dependent on the nature of the seabed. Although piles can be hammered into soft seabed types using percussive piling, such an approach may not be appropriate in areas of hard seabed. In such locations rock sockets may be pre-drilled and grouted pin piles, or screw piles may be used to anchor the foundation.

As piling and drilling into hard seabed types can be technically challenging, there is also the potential for gravity bases to be used. These would consist of bases (concrete, steel or iron) attached to a jacket foundation, acting as feet on the jacket structure (Plate 5-1).

Plate 5-1 Gravity base foot (Tidal Stream Limited)

The type of installation vessel will vary depending on the needs of the foundation, but would typically require a heavy lift crane barge or jack-up barge to undertake hydraulic piling or drilling. Once the pile is installed, it is likely that the TEC would be placed in position by a heavy crane vessel.

Gravity base foundations would typically be installed by the foundation being floated or transported by vessel to site and then guided into place by a heavy lift crane vessel, typically under the control of dynamic positioning (DP).

Seabed preparation may be required prior to foundation installation, this would usually involve either the removal or addition of material, in order to level the seabed beneath the foundation. Due to the high hydrodynamic energy environment of the MDZ, it is assumed that the need for scour protection will be minimal; however, this will be assessed in greater detail in the EIA. Any scour protection used would be expected to be rock or concrete mattress.

Floating Devices

Floating device types utilise a buoyant support structure on which to mount the TEC. There are several variations of device including low surface piercing superstructure TECs (e.g. Scotrenewables) and submerged, mid water column TECs (e.g. SME) (Table 5-1).

Twin rotor floating device types typically utilise catenary moorings (Plate 5-2) and may require up to four gravity anchors. These anchors tend to weigh in the region of 300 tonnes. Mooring lines are attached to the anchors to hold the TEC support structure in place. Gravity foundations for larger floating platforms may be up to 2000 tonnes in weight, with a footprint of up to 360m^2.

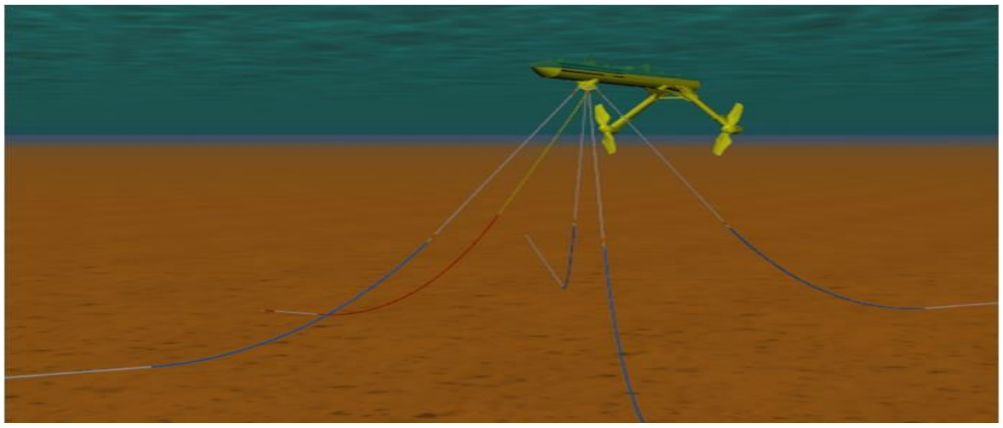


Plate 5-2 Catenary mooring system (Scotrenewables)

Other support structure designs, typically mid water column devices (e.g. SME), usually have a tensile mooring system to reduce movement. These are typically deployed using four anchor points and kept under tension, as opposed to the catenary mooring system which is not held under tension (Plate 5-3).

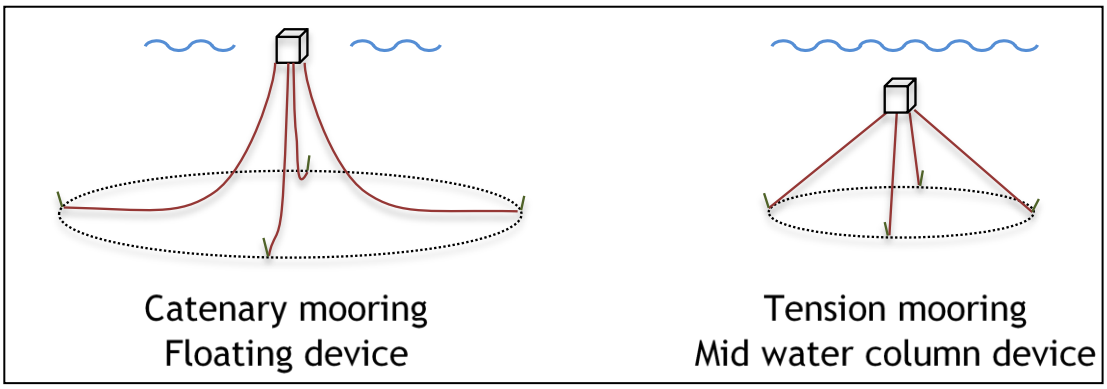


Plate 5-3 Schematic example catenary based mooring systems vs. tension based mooring systems

5.3.2.3 Cable and Offshore Electrical Components

The Project will require two main types of subsea cable: 1) inter-array cables, which connect individual devices to the electrical network via offshore electrical hubs, and 2) an export cable, which transports the generated energy to the onshore substation. The following gives a basic overview of the likely electrical components that will be considered during the EIA.

Inter-Array Cables

Inter-array cables link individual devices within an array to a singular point, where output from all devices is collected prior to exporting via the export cable. The length of inter-array cable required will depend on device and layout of the array. Similarly, the carrying capacity of the cable would also depend on the device layout and requirements, but would typically between 690V and 11kV.

As the seabed is expected to be rock with little surface sediment, it would be expected that inter-array cables would be surface laid and protected where appropriate. However, burial of the inter-array cable will also be considered within the EIA.

Offshore Electrical Hubs

Typically, individual TECs will generate power at 690V. This is then stepped up into an export grid compliant power (6.6kV or 11kV) via a step-up transformer in the devices nacelle.

Some device developers may require electrical hubs to connect multiple devices. This hub may be developed into one of the device or be a standalone multiple device platform connected to each device. Alternatively, multiple devices may be connected in series (daisy chained).

Where a separate electrical hub is required, it would be expected that this would most likely be surface piercing although submerged hubs may be considered. The foundations and installation methods will be similar to those discussed for the TEC foundations and will typically be mounted on a gravity base, pin-piled or monopiled foundation (for seabed mounted hubs) or anchored for buoyant mid-water or surface piercing hubs.

Offshore Export Cable

Up to nine export cables will transport power generated by the TEC arrays to the grid via the onshore infrastructure. Each array (berth) will require a specific export cable coming to land at the landfall location, with individual project export cables converging at an appropriate location and following a single approach to the landfall. Burial of the export cables will depend on seabed conditions between the offshore hub and the landfall, with export cables either buried or surface laid and protected, as appropriate. Both scenarios, and the methods for each, will be full considered within the EIA.

Installation will require a specialised cable laying vessel. In addition, specialised installation methods may be required in shallow waters, where the main cable laying vessel may not be able to access the landfall area. There are various methods available for cable laying and a range of appropriate methods will be assessed within the EIA.

5.3.2.4 Typical Device Installation Sequence

The installation sequence for most devices would be expected to follow the following format:

- A vessel installs the foundation system (where piled this will likely require subsea drilling from a DP vessel, or for gravity foundations a heavy lift vessel);
- A suitable vessel installs the support/superstructure;
- A suitable vessel installs the inter-array cabling and connects to the export cable; and
- A suitable vessel installs the TEC onto the foundation structure.

Offshore export cable installation would be expected to require burying of the export cable beneath the seabed surface wherever possible. A cable laying vessel is may be used to bury offshore cables, depending on seabed conditions. Where it is identified that cable protection is required, cable protection such as concrete mattresses or rock bags may be used to ensure the cable is protected and to prevent snagging.

5.4 Operations and Maintenance

The level of maintenance activity required will be highly dependent on the individual developers' requirements. A range of operations and maintenance (O&M) activities is anticipated from minor intrusive maintenance to full recovery and replacement of a device. A full range of O&M scenarios will be discussed within the EIA.

5.4.1 Offshore Components

The project will have a maximum 37-year lifespan. During this period, the O&M of devices will be the responsibility of the individual tenants; however, maintenance of offshore electrical hubs, inter array cables (between TEC arrays and offshore electrical hubs) and the export cable route will be the responsibility of Menter Môn. It is anticipated that once the devices are installed and operational, the systems can be largely monitored and maintained remotely through a central control room; however, limited offshore O&M activities may be required.

The offshore electrical hub(s) (if required) would be likely to be designed to be operated as an unmanned platform. Routine maintenance would be undertaken by either vessel or helicopter transfer. Where major and unexpected maintenance is required, such as the replacement of heavy items, additional vessels such as multi-cat workboats or heavy lift crane vessels might be required.

5.4.2 Onshore Components

The maintenance of onshore infrastructure is expected to be minimal and predominantly consist of scheduled O&M operations. The majority of maintenance is expected to take place at the substation, which will be easily accessible. Emergency access routes to the buried onshore cable corridor (and transition pit if required) may need to be identified for unexpected maintenance.

The PDE developed for the EIA will include O&M activities and infrastructure requirements. The impacts on receptors from the operation of onshore infrastructure will be fully considered within the EIA.

5.5 Decommissioning

Although contractual details have not been finalised, decommissioning of individual devices and arrays is likely to be the responsibility of the individual tenants. However, Menter Môn holds ultimate responsibility and the decommissioning of general infrastructure will be the responsibility of Menter Môn.

At this stage, decommissioning of onshore electrical infrastructure is expected to consist primarily of removal of the onshore substation. Offshore decommissioning methodologies would vary considerably between devices but would be expected to be similar to the construction phase in reverse. For the purpose of this report, it is assumed that cables are required to be removed as this represents the worst-case scenario in terms of impacts.

For the purposes of the EIA, the PDE will include a worst-case scenario for the decommissioning against which the assessment of impacts will be undertaken.

6 Proposed EIA Methodology

It is anticipated that an EIA will be required for the Project. This section sets out the proposed EIA stages.

6.1 EIA Process

The EIA will be carried out in accordance with the Transport and Works Act 1992 and the Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006. The approach to the EIA and the production of the resulting ES will closely follow relevant guidance including:

- Relevant guidance issued by government and non-governmental organisations; and
- Receptor specific guidance documents.

The EIA will also give due regard to the requirements of the Habitats Regulations and the Marine and Coastal Access Act 2009.

The EIA will consider all relevant topics covered under the three general areas of physical environment, biological environment and human environment for both the offshore and onshore elements of the proposed Project and present these in an ES.

Characterisation of the existing environment will be undertaken in order to determine the baseline conditions in the area covered by the Project and relevant surrounding study areas. The approach to establishing a robust baseline is summarised under each topic within this Scoping Report, and Menter Môn will seek to agree this via consultation, for example, from the views expressed in the Scoping Opinion and any additional consultation.

Consultation is a key element of the EIA process and consultation with technical consultees will be crucial to the development of this assessment. To this end, a number of forums will be established by Menter Môn to enable technical discussions with experts from relevant stakeholder groups. The final ES will include full assessments for topics which take account of all stakeholder information and feedback. The consent application will be accompanied by a comprehensive Consultation Report summarising the consultation undertaken with the persons specified in the Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006.

6.2 The Environmental Statement

The findings of the EIA will be presented in a written ES, which will include the following information.

6.2.1 Introductory Chapters

Overview of Renewable Energy and Project Introduction
An introduction to renewable energy development and in particular, tidal power, will be outlined providing an overview of the potential benefits of the development in terms of reduced emissions. It will also outline the project drivers, aims and objectives.

Overview of EIA Methodology
An overview of the impact assessment methodology used for the EIA process, including scoping, consultation and the identification of key environmental effects, will be outlined.

Site Selection Process
A description of the site selection process for the tidal array and grid connection route will be outlined.

Project Description
Details of the site and a description of the proposed tidal array will be discussed. This will include details of the possible size, layout and design of the site and associated onshore/offshore infrastructure. This chapter will also outline the construction, installation, operational, maintenance and decommissioning requirements of the Project.

Policy and Legislation
This section will present an overview of the relevant statutory planning guidance and Development Plan policies which apply to the proposed development.

6.2.2 EIA Results

The ES will document the EIA process and will describe the project and the EIA process with regard to the latest legislation, policy and guidance. Subject to agreement on topics to be scoped in and out of the EIA within the Scoping Opinion, the ES is likely to comprise the following documents, parts and chapters:

- Non-Technical Summary
- Environmental Statement
  - Introductory Chapters
    - Introduction
    - Need for the Project
    - Policy and Legislative Context
    - Site Selection and Assessment of Alternatives
    - Project Description
    - EIA Methodology
  - Physical Environment
    - Metocean Conditions and Coastal Processes
    - Marine Water and Sediment Quality
    - Geomorphology, Soils, Hydrology and Flood Risk)
  - Biological Environment[24]
    - Natural Heritage Designated Sites
    - Benthic Ecology
    - Marine Mammals, Basking Sharks and Reptiles
    - Fish and Shellfish Ecology
    - Ornithology
    - Terrestrial and coastal ecology
  - Human Environment
    - Seascape and Landscape
    - Land Use and Quality
    - Commercial Fisheries
    - Shipping and Navigation and Other Marine Users
    - Military Activity

[24] *Designated sites to be included as either a standalone chapter or within receptor specific chapters.*

- Archaeology and Cultural Heritage
- Noise and Vibration
- Air Quality
- Tourism and Recreation
- Aviation
- Traffic and Transport
- Health
- Socio-economics.

Each topic chapter will describe the approach taken to impact assessment. This will include an outline of relevant consultations undertaken, documentation studied and the means of defining the Area of Search (AoS) for that topic. Should there be any difficulties (technical deficiencies or lack of know-how) encountered in compiling the required information, this will be noted. The existing baseline conditions for the topic will then be described. An assessment will then be made of the nature, magnitude, duration and significance of the likely effects of the construction, operation, maintenance, and decommissioning of the proposed development on the topic. Mitigation measures to avoid, minimise, or remedy the predicted effects, where practical, will be outlined. An assessment will be made of the significance of the likely residual effect, following mitigation. Potential cumulative effects will be discussed within each EIA topic chapter, and summarised in a cumulative effects chapter.

With regard to the requirements of the new EIA Regulations (Section 3.2.6) and changes to traditional assessments, the ES will incorporate these within the structure proposed adding emphasis on new elements where required. For example, climate change is already considered as a key component of the Metocean Conditions and Coastal Processes assessment, but may be relevant to other topics, in particular, ecological receptor topics (e.g. Benthic and Intertidal Ecology). Where required, Menter Môn will work with stakeholders to determine how best to consider climate change within the assessments. Major accidents and disasters will be considered in the context of how the Project is designed and the measures in place in case of emergency (e.g. such as pollution prevention and response). Biodiversity is inherently considered within ecological receptor topics of the EIA. Menter Môn will continue to work with the stakeholders to confirm that the assessment of ecological topics and their inter-relationships are robust.

7 Physical Environment

7.1 Metocean Conditions and Coastal Processes

This section discusses meteorological, oceanographic and coastal processes in the offshore scoping area. Far-field effects on the coastal area adjacent to the offshore scoping area have also been considered.

7.1.1 Baseline

7.1.1.1 Oceanography

The waters around the offshore scoping area are considered dynamic in terms of oceanographic conditions and sediment transport. The wave climate on the site is variable and highly dependent on weather conditions. The dominant swell direction is from the southwest whilst wave driven waves are usually from an either southwest or westerly direction.

Current speeds are variable across the site and can reach up to 3.7m/s depth averaged velocities[25]. Water depths across the site vary but are generally around 40m, although a depression in the seabed known as Careg Hen reaches 56m at its deepest point.

7.1.1.2 Meteorological Conditions

The predominant wind directions recorded at Anglesey are south and southwest with a yearly average of 40% of winds coming from those directions (based on historical data from 1974 to 2012[26]). Daily mean wind speeds are recorded as between 8m/s (in January) and 5m/s (in July) with 13m/s recorded as the highest daily maximum in January and 1.75m/s recorded in April.

Daily average temperatures range from between 4°C and 19°C, with August being the warmest month on average and February being the coolest.

The median cloud cover is between 80% and 90%, the predominant precipitation type is moderate rain (76% of precipitation) and the probability of precipitation on a single day ranges from 58% to 76%.

7.1.1.3 Physical Processes

The west coast of Holy Island is predominantly west facing and is exposed to significant wave action from a southwest direction which drives coastal processes along the coast. Coastal erosion has been an ongoing problem in the coastal area around Trearddur Bay, resulting in the implementation of a coastal protection scheme in this area. This protection scheme includes the construction of a new sea wall.

Physical processes along the Holy Island coastline are constrained by the presence of hard rock headlands with bays forming from the cutting into of glacial infill, these hard headlands dictate the dissipation of wave energy causing variations between sandy bays and exposed rock foreshores. The formation of individual bays and manmade coastal structures cause localised changes in transport systems which influence both the bay and backshore shape. Areas of softer sediment and clay cliffs tend to erode quicker resulting in wider sandy bays[27].

[25] *Piano, M., Neill, S.P., Lewis, M.J., Robins, P.E., Hashemi, M.R., Davies, A.G., Ward, S.L and Roberts. M.J (2017)* https://www.sciencedirect.com/science/article/pii/S0960148117304081 (accessed February 2018)
[26] *WeatherSpark https://weatherspark.com/averages/28745/Anglesey-Wales-United-Kingdom (accessed January 2018)*
[27] *West of Wales Shoreline Management Plan (2011), Policy Development Coastal Area G* http://www.westofwalessmp.org/content.asp?nav=23&parent_directory_id=10 *(accessed January 2018)*

7.1.2 Potential Impacts

Table 7-1 Potential impacts on metocean conditions and coastal processes

Potential Impact	Phase	Anticipated Significance	Comment
Changes to sediment transport system by changes in wave and current climate	Operation	Significance of impact unknown	Changes in metocean conditions are not expected to deviate significantly from baseline conditions; therefore, little or no change to sediment transport systems are expected. This will be confirmed through the EIA.
Increased suspended sediment from reduced water energy	Operation	Significance of impact unknown	Although not expected to be a significant impact, removal of tidal energy from the environment may result in increased sedimentation down stream of TEC devices.
Changes to coastal erosion	Operation	Significance of impact unknown	Changes to local hydrodynamic regime, for example, changes to tidal energy and wave directions may result in changes to the coastal erosion regime on the west coast of Holy Island, adjacent to the offshore scoping area.

7.1.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on the following:

- Further detailed information regarding hydrodynamic and coastal process within the site and adjacent coastal area. This could be done through a thorough review of available data such as Shoreline Management Plans and coastal defence management plans, as well as coastal process conceptual modelling.

7.2 Marine Sediment and Water Quality

This section discusses the marine sediment and water quality conditions within the offshore scoping area and adjacent Holy Island coastal area.

7.2.1 Baseline

7.2.1.1 Water Quality

Coastal Waters

There are eight bathing water beaches along the west coast of Anglesey, all of which meet the higher water quality standard[Error! Bookmark not defined.] and have consistently met the higher standard since 2010. There are five beaches adjacent to the MDZ: Porth Darafach, Borth Wren, Trearddur Bay, Silver Bay Rhoscolyn and Rhosneiger. There is also a designated European Shellfish Water called Beddmanarch, which is located off the coast of Penrhos Coastal Park.

The water catchment areas have a mix of rural, residential and commercial use but are predominantly rural in nature. Water catchment areas typically have a low level of sewage and industrial run-off. There are no known issues with agricultural run-off.

Offshore Waters

There is no site-specific information on water quality. The offshore scoping area has a dynamic hydrological regime with a varied wave regime and a strong tidal regime that provides the site with high levels of mixing and dispersal. Given the low level of industrial activity in adjacent coastal areas and dynamic hydrological regime, it is anticipated that water quality offshore will be good.

7.2.1.2 Sediment Quality

Coastal Waters

Sources of sediment input to the coastal area are generally low, although periods of heavy rain increase surface run-off from rural and populated land, increasing riverine and coastal suspended sediment levels. However, sources of contaminated sediment are limited and no sources that would cause significant sediment contamination have been identified.

Offshore Waters

Little is currently known about the sediment quality further offshore. However, SEACAMS have undertaken high-resolution multibeam bathymetry surveys and sediment grab samples of the Holyhead Deep disposal site, used by Minesto as part of the Holyhead Deep Green EIA[28]. From this data, the proportion of fine sediments within the offshore scoping area is expected to be low, with mainly coarse sediments and rock being present due to the presence of strong hydrological regimes. The coarse sediment type, dynamic nature of the oceanographic data and the rural nature of the coastal area would suggest that there are likely to be low levels of contamination within the site. As part of the Holyhead Deep Green EIA, Minesto commissioned sediment contamination analysis of grab samples collected within the area, and found that certain contaminants (arsenic, chromium, lead, mercury and nickel) exceeded Interim Sediment Quality Guidelines (ISQS) Threshold Effect Levels (TES) and Cefas Action Level 1, but none exceeded the Probable Effect Levels (PEL) or Cefas Action Level 2.

7.2.2 Potential Impacts

Table 7-2 Potential impacts on marine sediment and water quality

Potential Impact	Phase	Anticipated Significance	Comment
Increase in suspended sediment	Construction	Potential significance unknown	Increased suspended sediments leading to smothering of surrounding habitats or a release of contaminated sediments is very unlikely in a tide-swept area. If an increase in suspended sediments does occur, this will be rapidly dispersed due to tidal flows. The tidal flows will also reduce any smothering potential due to increased dilution and dispersion rates.
Removal of surface sediment through scour	All	Potential impact significance unknown	The presence of seabed structures has the potential to result in scour of surface

[28] *Minesto (2016) Deep Green Holyhead Deep Project Phase 1 (0.5MW) Environmental Statement https://minesto.com/projects/holyhead-deep (accessed February 2018)*

Potential Impact	Phase	Anticipated Significance	Comment
			sediments. The likelihood of scour is likely to vary across the site and with technology foundation type. However, it is expected that the site will largely consist of coarse sediments and rock therefore scour will be minimal.
Contamination of the offshore water environment	Construction and Operation	Not significant once standard industry guidelines are implemented	There is the potential for accidental release of fluids in to the environment through both construction and operational phases. The risk of this is managed through the implementation of industry standard best practice guidelines, for example, appropriate use of chemicals, spill response, marine pollution contingency plans and pollution prevention guidelines (PPGs); therefore, the risk of pollution is not deemed to be significant.
Contamination of marine sediments	Construction and Operation	Effect unlikely to be significant	Industry standard best practice guidelines will be followed at all times, for example, appropriate use of chemicals, spill response, marine pollution contingency plans and PPGs, (in particular PPG1 and PPG5); therefore, risk of contamination is not deemed to be significant.

7.2.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Baseline sediment contamination conditions in the offshore scoping area. This would be done through a review of literature and data such as the Clean Seas Environmental Monitoring Programme (CSEMP)[29] It is likely that site-specific sediment contaminant sampling would also be undertaken during the EIA.
- Baseline water quality conditions within the offshore scoping area. This would be done through a review of available literature.

7.3 Geology, Geomorphology, Soils, Hydrology and Flood Risk

This section outlines the onshore geology, geomorphology, soils and hydrology within the onshore scoping area and adjacent environment.

[29] *BODC CSEMP Interactive Map http://www.bodc.ac.uk/projects/uk/merman/assessments_and_data_access/csemp/ (accessed January 2018)*

7.3.1 Baseline

7.3.1.1 Geology

Anglesey as a whole is an important geological feature and is an important area in the UK for understanding the large-scale tectonic processes that were responsible for the formation of central and southern Britain. Anglesey is a classic example of landform structure formed from glacial pressure and movements, predominantly by fast flowing glaciers meeting the Irish Sea[30]. The northern area of Anglesey, including Holy Island, was formed by ice flowing from the Irish Sea Ice Stream which appeared to flow in a northeast to southwest direction across Anglesey, leaving distinctive striations. This area of north Anglesey is characterised by the presence of drumlins, which are egg shaped sub-glacial landforms. Drumlins are less common on Holy Island but are present. Due to its significant geology status, parts of Anglesey are designated as a Geopark.

Superficial deposits around the coast of north and west Holy Island as well as the Anglesey Mountain area consists of mainly pre-quaternary rock with a shallow overlying layer of surface sediments or exposed rock. There are several discrete areas of deeper alluvium superficial deposits present which mainly consist of sand and gravels. The most notable area for this within the scoping area is approximately 1km north east of Penrhos Feilw.

The geology of the onshore scoping area falls into two main geological formations, the South Stack Group and the New Harbour Group [31]. Bed rock on Holy Island consists of mainly Pre-Cambrian rocks, notably the Mon Complex. South Stack is a good example of a bedded succession formation and is the basal unit of the Monian Supergroup of Holy Island. The rocks around South Stack are representative of sandy tubidites (psammites) and schistose mudstones (pelites). The New Harbour Group overlies the South Stack group. Figure 7-1 provides and overview geological formations within the onshore scoping area.

[30] *British Geological Society http://www.bgs.ac.uk/research/ukgeology/wales/angleseyNorthWales.html (accessed January 2018)*

[31] Kawai, T., Windiey, B.F., Terabayashi, M., Yamamoto, H., Maruyama, S., Isozaki, Y., (2006): Mineral isograds and zones of the Anglesey blueschist belt, UK: implications for the metamorphic development of a subduction-accretion complex. *Journal of Metamorphic Geology **24**, pp. 591-602.*

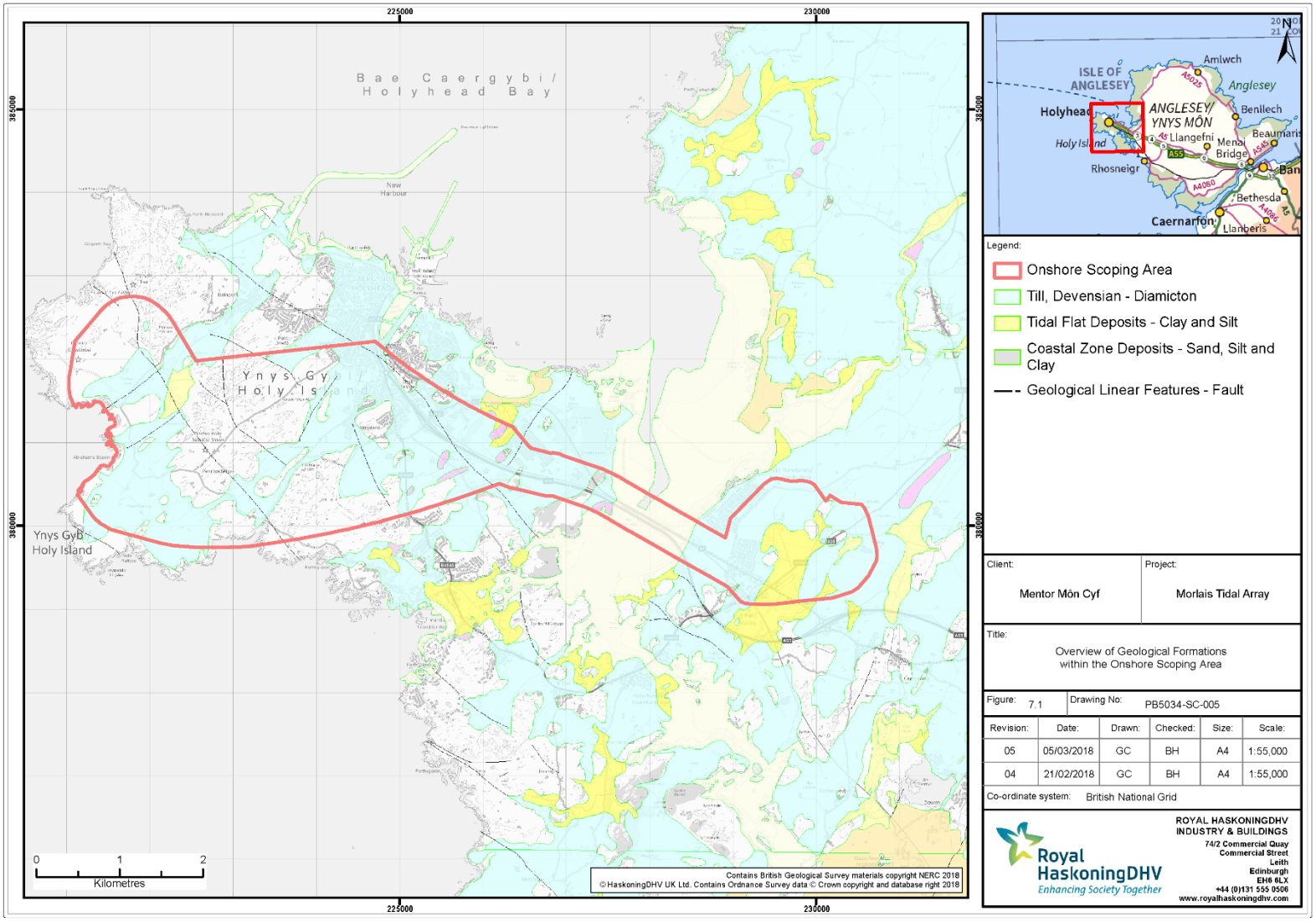


Figure 7-1 Overview of geological formations within the onshore scoping area

7.3.1.2 Geomorphology

Typically, the coastal areas around the north and northwest of Holy Island consist of hard rock outcrops interspersed with sandy bays. Areas of softer clay are found outside the onshore scoping area around the south-west coast, to the north of Rhosneigr and Holyhead Bay, where large expanses of sandy beach are present. Within the scoping area there are no large expanses of beach or low lying coastal habitat but there are several small beaches which are present between rocky head land.

The western part of the scoping area is typically characterised by a narrow coastal strip consisting of seacliffs (approximately 30m high) rapidly elevating towards the upland area of Holyhead Mountain and adjacent moorland. Elevation in the scoping area rapidly increases from seacliff to 220m at the summit of Holyhead Mountain, within 1km of the coast. The southwestern section of has a more gradual profile, with elevations gradually increasing from around 30m at the seacliffs to around 60m-70m at the summit of the moorland 2-3km inland.

The Holyhead and Penrhos areas of the onshore scoping area are typically flat coastal areas that were created through glaciation that formed the Holy Island Strait between Holy Island and the main Anglesey Island.[32]. Inland of the coastal area, the land within the onshore scoping area is rural agricultural land with a low topographical profile.

7.3.1.3 Soils

There is little site-specific information on soils available within the onshore scoping area. Data from previous studies within the onshore scoping area suggests that the west and central area of Holy Island is typically made up of a thin layer of topsoil 0m to 0.5m in depth which overlies either glacial deposit or silts and clays. Bedrock is typically 1.5m to 2m below the ground level[33].

There is the potential for both the onshore substation and switch house at the grid connection point to be located on existing made ground, although this is not confirmed at this stage. Alternatively, the onshore substation may be located on unmade ground which would either be agricultural rough grazing land or scrub land.

7.3.1.4 Hydrology and Flood Risk

There are several hydrological features within the onshore scoping area. There is a small area of standing surface water marked on the Ordnance Survey (OS) Map 1:25,000 (Ref SH 20908, 82444), which appears to be a shallow depression in the surrounding topography approximately 75m x 25m. There is a second depression filled with water (approximately 25m x 10m) 50m to the west. There does not appear to be any notable surface water inputs to these features.

A second hydrological feature; marked as a reservoir on the 1:25,000K OS Map, is adjacent to the South Stack Road (SH 22210, 81944). There is a second, smaller reservoir associated with this, approximately 400m in a north-west direction; the two reservoirs appear to be connected, at least partly, via a small stream. A site walkover indicated that this is likely to be temporary depending on rain and surface water levels. Aerial imaging and the OS map indicates a surface water source (well) which feeds the reservoir from the north east, and continues to the south west into what appears to be an area of wetland.

The 132kV grid connection route option between Parc Cybi and Valley crosses the Cymyran Strait which is a saltwater inlet approximately 1km wide where the A5 and A55 cross. The cable route would need to

[32] *CCW (2008b). Welsh seascapes and their sensitivity to offshore developments. A report by the Countryside Council for Wales, 45pp.*
[33] Atkins 2006. Land at Ty Mawr, Holyhead Anglesey- Archaeological watching brief Report number 656.

cross the strait in order to access the grid connection at Valley. It is proposed that the cable route would cross within existing road crossing which would minimise the risk of hydrological impacts.

There are a number of springs and minor streams throughout the onshore scoping area but there are no major rivers or open water areas that would require crossing (as indicated by aerial footage or on the OS Map). Breakwater Park contains several ponds; however, this is outside of the onshore scoping area with no obvious surface water connections to any of the substation locations or cable routes.

Within the onshore scoping area the majority of areas appear to be of low surface water flood risk, with limited areas at risk of flooding from rivers or sea[34] also. There are a number of springs and minor streams throughout the onshore scoping area, with Porth Y Felin as the main river on the island. Tidal flood risks can be estimated for various locations along the coast and are related to metres above Ordnance Datum. The landfall area is within a flood zone with risk of flooding from rivers and seas during high tidal events. The Welsh Government's Technical Advice Note[35] (TAN) on development and flood risk states that the onshore works will be located within the extreme flood outline, (equal to or greater than 0.1%) from river, tidal or coastal flooding. Flood risk (including sea level rise associated with climate change) should therefore be considered further as part of the EIA.

7.3.2 Potential Impacts

Table 7-3 Potential impacts on geology, geomorphology, soils and hydrology

Potential Impact	Phase	Anticipated Significance	Comment
Impact to geology features	All	Significance of impact unknown (predicted to be negligible)	Due to the nature of the work, it is not anticipated that there will be an impact on geological features from the onshore works. With the exception of the landfall, excavation for onshore works would be expected to be within surface soils. Landfall installation would either require open trenching or HDD drilling through rock.
Impacts to geomorphology (and topography)	All	Negligible	Excavation of the onshore cable route and groundworks for the substation are expected to be predominantly within road or made ground (areas that are already modified), although some unmade ground options are being considered. As cable will be buried, it is not anticipated that there would be permanent changes to geomorphology or topography, although there may be temporary disturbance during construction and possibly decommissioning phases.

[34] *NRW Long Term Flood Risk https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en (Accessed January 2018)*
[35] *TAN: Development and Flood Risk http://gov.wales/docs/desh/publications/040701tan15en.pdf (accessed January 2018)*

Potential Impact	Phase	Anticipated Significance	Comment
			Once buried, the ground level of the cable route would be returned to near baseline conditions. Therefore, it is not anticipated that there would be an impact on geomorphology or topography.
Compaction and degradation of soils	Construction	Significance of impact unknown	Due to the need for excavation works during installation of the onshore cable route there will be a requirement to disturb surface soils. This can result in compaction and degradation of excavated soils, particularly topsoil. The extent of significance would be influenced by the final locations and construction methodology used. In addition, construction plant activities may also cause compaction of soils in the surrounding working area. Installation in areas of made ground are less likely to result in impacts to surface soils.
Changes to hydrology (including private water supplies)	All	Significance of impact unknown	The cable route may need to cross hydrological features such as streams or drainage channels. The impacts of this will be dependent on construction methodology, location and nature of hydrological features in the development area.
Impact to flood risk	All	Significance of impact unknown	The onshore works will be located within the extreme flood outline, (equal to or greater than 0.1%) from river, tidal or coastal flooding. The impacts of this will be dependent on construction methodology, location and nature of hydrological features and flood risk zones in the development area. Flood risk (including sea level rise associated with climate change) should therefore be considered further as part of the EIA.

7.3.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Site specific description of soils. It is likely that this would be undertaken through a combination of desk review, site visits and geophysical site investigations.
- Detailed information regarding hydrological features that may be impacted by the Project, including private water supplies. This would include ground water flow, surface water flow, drainage and flood risk zones.
- A review of potential impacts in terms of the WFD, considering morphological, ecological and chemical aspects of onshore water receptors and coastal receptors within 1nm of the coastline. The potential requirement for a WFD Compliance Assessment and requirements under the WFD will be reviewed.

8 Biological Environment

8.1 Natural Heritage Designated Sites

This section outlines the natural heritage designated sites with the potential to be impacted by the Project.

8.1.1 Baseline

Anglesey and the wider area are important areas for natural heritage due to their wide variety of environments and largely undisturbed environment. Figure 8-1 shows designations around Holy Island and the wider Anglesey and northwest Wales area.

Receptors such as birds, marine mammals and migratory fish have the potential to be present in areas considerable distances from their origin site. Impacts to individual far-ranging species are likely to be limited; however, migratory and far-ranging species will be considered within the EIA.

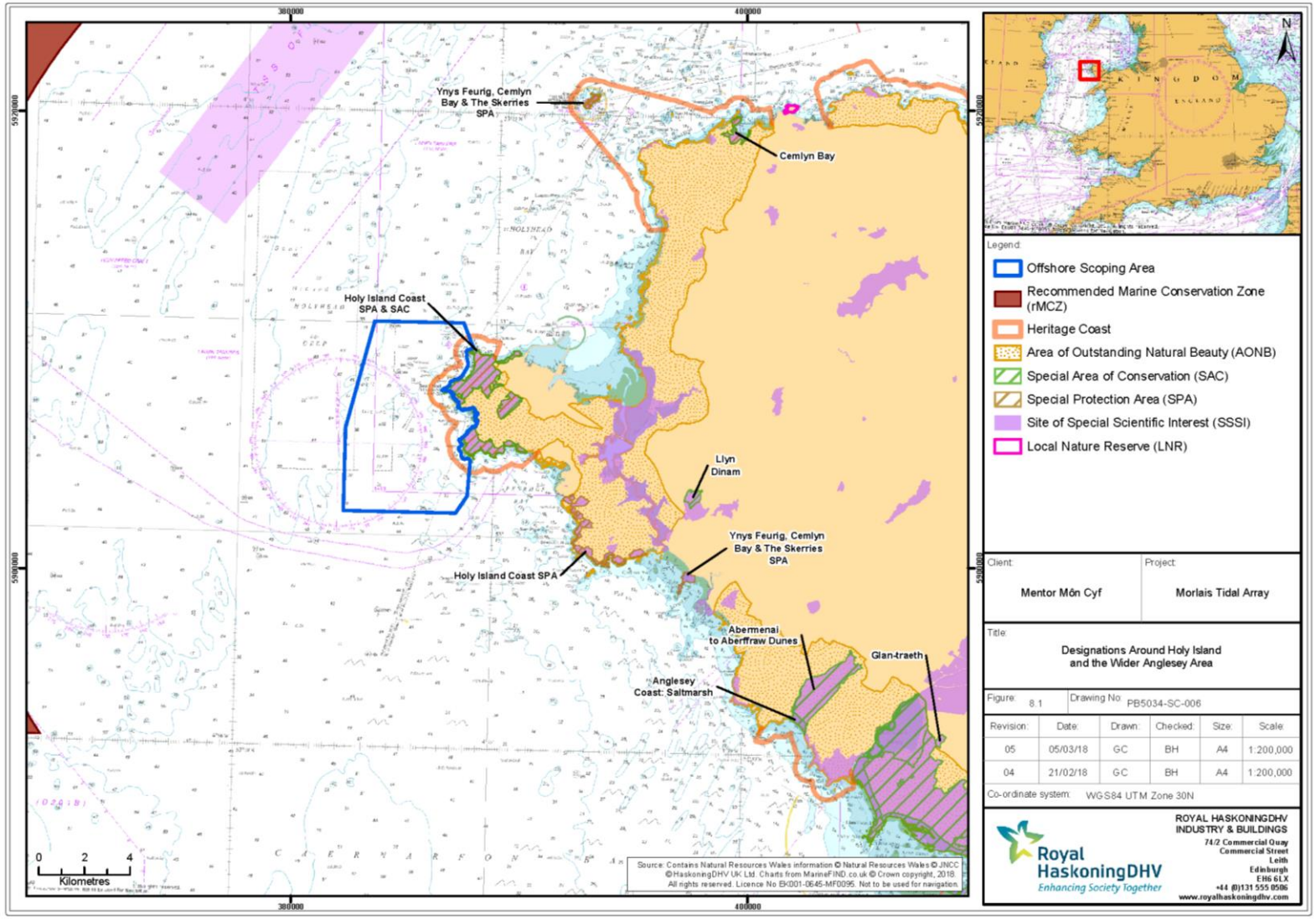


Figure 8-1 Designations around Holy Island and the wider Anglesey area

8.1.1.1 Onshore

For wide ranging onshore ecological receptors such as ornithology an initial search area of up to 25km has been used for these receptors. However, in terms of impacts, onshore infrastructure is unlikely to have impacts on SACs beyond those in the immediate vicinity unless the footprint falls within an area that is used by migrating or wider ranging species. Direct physical disturbance to receptors will only be likely where components or associated project features are within sites. Indirect impacts such as behavioural disturbance to receptors or changes in hydrological conditions may occur; however, given that Holy Island is an island with no freshwater connection to the mainland, it is expected that any potential impacts would be localised to Holy Island. In addition, behavioural impacts on ecological receptors would be expected to relate to visual and noise disturbance and be restricted to the vicinity of local works and adjacent area.

Therefore, for the purpose of this scoping report, only designated sites within 10km have been considered in detail, however, the potential for connectivity with sites at a greater distance will be considered within the EIA for wider ranging receptors such as ornithology as appropriate.

Guidance provided by NRW (2014[36] and 2015[37]) have been used to identify potential natural heritage (and other) receptors.

The potential for impacts to protected European sites to (both as a result of the Project on its own or in-combination with other proposed projects) are expected to require consideration under Habitats Regulations (2010) (Section 3.2.7). Information required for informing a Habitats Regulations Assessment will be provided alongside the EIA with sufficient information to allow the Competent Authority to determine whether there is the potential for likely significant effect to occur. Consideration of the impacts on protected sites will consider the conservation objectives of sites with the potential to be impacted. In addition to the consideration of protected sites, protected species will be considered within the EIA.

Table 8-1 provides a list of designated sites that have been identified as potentially requiring consideration.

8.1.1.2 Offshore

Due to the wide-ranging nature of offshore ecological receptors such as offshore ornithology and marine mammal receptors, an initial search area of up to 50km has been used for these receptors. As above, draft guidance provided by NRW (2014 and 2015) have been used to identify potential Natural Heritage (and other) receptors.

Table 8-1 provides a list of designated sites that have been identified as potentially requiring consideration.

[36] *National Resource Wales Draft Advice on scoping an Environmental Impact Assessment (EIA) for marine renewable energy development.*

[37] *National Resources Wales (2015) Checklist of Natural Heritage Tidal Stream energy demonstration zone West of Holy Island, Anglesey.*

Table 8-1 Summary of designated sites

Site Name	Designation	Features	Potential Impacts
Cors Fochno and Dyfi Estuary Ramsar	Ramsar	Estuary with adjoining saltmarsh, sand dunes and unmodified actively growing raised mire. Supports varying flora and fauna, including wintering birds: Greenland white fronted goose and wigeon. Also: shelduck, teal, red-breasted merganser, curlew, red-throated divers, great crested grebes and various birds of prey.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Croker Carbonate Slabs MPA	cSAC/SCI	This site is characteristic of the habitat 'submarine structures made by leaking gases' under the subtype "bubbling reefs". These structures form a complex seabed topography providing a diverse habitat for a range of marine life. In other parts of the site, thin slabs form 'pavements', which are often overlain with a thin veneer of mobile sand and gravel.	No physical works within the cSAC therefore no impact on geology or marine interests predicted.
Gogledd Môn Forol	cSAC	Candidate SAC for harbour porpoise (*Phocoena phocoena),* for which this site is considered to be one of the best areas in the United Kingdom. Submitted to the European commission in January 2017.	Temporary/permanent physical disturbance to habitat important for Harbour porpoise Physical and behavioural disturbance to harbour porpoise.
Gorllewin Cymru Forol	cSAC	Candidate SAC for harbour porpoise.	Indirect impacts due to mobility of harbour porpoise.
Abermenai to Aberffraw Dunes	SAC	Dune grassland and vegetation; Shifting dunes; Dune slacks; Natural eutrophic lakes.	No impact anticipated.
Afon Eden – Cors Goch Trawsfynydd	SAC	Annex I habitats not primary reason for site selection: Active raise bogs; Annex II species: Freshwater pearl mussel and floating water-plantain; Annex II species: Atlantic salmon and otter	Effects of Electromagnetic Fields (EMF); Effects of underwater noise; Barriers to migration routes; Collision risk with devices; Effects of habitat loss; Indirect effects such as changes to habitat or availability/distribution of prey species.
Afon Gwyrfai a Llyn Cwellyn	SAC	Annex I habitats; oligotrophic to mesotrophic standing waters with vegetation of the *Littorelleta uniflorae* and/or of the *Isoëto-Nanojucetea*, water courses of plain to montane	Effects of EMF; Effects of underwater noise; Barriers to migration routes; Collision risk with devices;

		levels with the *Ranuculion fluitantis* and *Callitricho-Batrachion* vegetation. Annex II species, Atlantic salmon and floating water-plantain. Annex II species; otter	Effects of habitat loss; Indirect effects such as changes to habitat or availability/distribution of prey species.
Cardigan Bay	SAC	Breeding population of bottlenose dolphins (*Tursiops truncatus*) Additional Annex I habitats present - sandbanks which are slightly covered by seawater all the time, reefs and sea caves Additional Annex II species present – sea lamprey, river lamprey, grey seal	Disturbance; Effects of underwater noise; Effects of habitat loss; Collision risk (devices and vessels); Indirect effects such as changes to habitat or availability/distribution of prey species. Effects of EMF; Barriers to migration routes;
Cemlyn Bay	SAC	Coastal lagoons; Perennial vegetation of stony banks.	No impact anticipated.
Cors Heli	SAC	Estuaries; Saltmarshes; Atlantic saltmeadow; *Salicornia*; Other annuals colonising mud and sand.	No impact anticipated.
Dee Estuary	SAC	Annex I habitats: mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows. Additional Annex I habitats present – Estuaries, annual vegetation of drift lines, vegetated sea cliffs of the Atlantic and Baltic Coasts, Embryonic shifting dunes, Shifting dunes along the shoreline with *Ammophila arenarie*, fixed coastal dunes with herbaceous vegetation, humid dune slacks. Annex II species; not primary reason for site selection: Sea lamprey, river lamprey and Petal wort.	Disturbance; Effects of EMF; Effects of underwater noise; Barriers to migration routes; Collision risk with devices; Effects of habitat loss; Indirect effects such as changes to habitat or availability/distribution of prey species.
Glannau Ynys Gybi	SAC	*Salicornia* and other annuals colonising mud and sand; Atlantic salt meadows; Estuaries and mudflats; Sandflats not covered by seawater at low tide.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat.
Holy Island Coast	SAC	Vegetated sea cliffs; Northern wet heaths; European dry heaths	No impact anticipated.

Llyn Dinam	SAC	Natural eutrophic lakes with Magnoptamion or Hydrocharition-type vegetation.	Indirect impacts due to impacts/changes to connected hydrological features (considered unlikely).
LLŷn Dinam	SAC	Natural eutrophic lakes	No impact anticipated
Pembrokeshire Marine	SAC	Annex I habitats: estuaries, large shallow inlets and bays, reefs. Additional Annex I habitats present – sandbanks which are slightly covered by sea water all the time, mudflats and sandflats not covered by seawater at low tide, coastal lagoons, Atlantic salt meadows, submerged or partially submerged sea caves. Annex II species: Grey seal and shore duck. Annex II species, not primary reason for site selection: Sea lamprey, river lamprey and Allis shad	Disturbance; Effects of underwater noise; Effects of habitat loss; Collision risk (devices and vessels); Indirect effects such as changes to habitat or availability/distribution of prey species.
Pen LLŷn a`r Sarnau	SAC	Annex I habitats: sandbanks which are slightly covered by seawater all the time, estuaries, coastal lagoons, large shallow inlets and bays, reefs. Additional Annex I habitats present - Mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonising mud and sand, Atlantic salt meadows, submerged or partially submerged sea caves. Annex II species, not primary reason for site selection: Bottlenose dolphin, otter and grey seal	Disturbance; Effects of underwater noise; Effects of habitat loss; Collision risk (devices and vessels); Indirect effects such as changes to habitat or availability/distribution of prey species.
River Dee and Bala Lack	SAC	Annex I habitats: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Annex II species, Atlantic salmon and floating water-plantain Annex II species; not primary reason for site selection: Sea lamprey, brook lamprey, river lamprey, bullhead and otter	Effects of EMF; Effects of underwater noise; Barriers to migration routes; Collision risk with devices; Effects of habitat loss; Indirect effects such as changes to habitat or availability/distribution of prey species.
Aberdaron Coast and Bardsey Island	SPA	Supports chough populations throughout breeding and wintering. Breeding colonies of manx shearwaters	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species;

			Effects of lighting
Anglesey Terns / Morwenoliaid Ynys Môn	SPA	Largest tern colony in Wales (500-900 breeding pairs) of roseate, sandwich, common and arctic. Series of islands about 1km out to sea.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Dee Estuary	SPA	Extensive intertidal sand, mudflats and salt marsh. Supports: ducks and waders during winter; breeding colonies of two species of terns during summer; wader and sandwich terns during migration periods.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting.
Dyfi	SPA	Wintering area for Greenland white-fronted goose.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Glannau Ynys Gybi	SPA	Important site for wintering and breeding red billed chough (*Pyrhocorax pyrhocoras*).	Temporary/permanent physical disturbance to onshore coastal habitat important for ornithological receptors; Physical and behavioural disturbance to ornithology receptors (breeding/overwintering).
Grassholm	SPA	Supports breeding gannets during summer.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Holy Island Coast	SPA	Birds: *Pyrrhocorax pyrrhocorax* (migratory; breed and winter); invertebrates; solid geology.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species;

			Effects of lighting.
Liverpool Bay	SPA	Marine site supports red-throated diver and common scoter.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Puffin Island	SPA	Breeding colony of cormorant (*Phalacrocorax carbo*). Supports various seabirds: puffins, razorbills, guillemots, black guillemots.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Skomer and Skokholm	SPA	Supports breeding seabirds: petrels, gulls and auks. Resident species; chough and short eared owl.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Traeth Lafan	SPA	Local Nature Reserve; supports wintering waterbirds, especially oystercatchers and great crested grebes found here for their autumn moult.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Ynys Feurig, Cemlyn Bay and The Skerries	SPA	Important site for breeding terns: *Sterna dougallii* (3 pairs), *Sterna hirundo* (189 pairs); *Sterna paradisaea* (1290 pairs); *Sterna sandvicensis* (460 pairs).	Impacts from onshore construction considered unlikely due to lack of pathway.
Ynys Feurig, Cemlyn Bay and the Skerries	SPA	Migratory terns; breeding *Sterna dougallii*, *Sterna hirundo, Sterna paradisaea, Sterna sandvicensis*	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting

Beddmanarch-Cymyran	SSSI	Comprises of mudflats and sandflats with large areas of seagrass and rare dune heathland, including saltmarsh and associated vegetation: *Zostera* eelgrass beds (3 species recorded). Area supports wide range or wintering water-birds, e.g. overwintering ringed plover, greenshank, red breasted merganser and golden eye.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat; Physical and behavioural disturbance to ornithology receptors (breeding/overwintering).
Carmel Head	SSSI	A large variety of geological features along this stretch of the coastline making Carmel Head area one of the most interesting sections of North Wales.	Impacts from onshore construction considered unlikely due to lack of pathway.
Carreg y Llam	SSSI	Notified feature of breeding guillemot, largest guillemot colony in North Wales.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Cemlyn Bay	SSSI	Tidal lagoon and shingle ridge, supports breeding terns and wintering wildfowl.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Clegir Mawr	SSSI	Botanical interest features, mostly designated for nationally rare annual rockrose. Good example of acidic soil associated species, including sheep fescue, common bent, squirreltail fescue, early hair-grass, heather, bell heather, western gorse, spring squill and English stonecap.	Impacts from onshore construction considered unlikely due to lack of pathway.
Fferam Uchaf	SSSI	Geological interest feature for exposed Llanvirn rocks. The site compromises of small out rock outcrops including a quarry.	Impacts from onshore construction considered unlikely due to lack of pathway.
Glannau Ynys Gybi: Holy Island Coast	SSSI	Good example of coastal heathland, grassland, cliffs, and assemblages of vascular plants and ornithological interests.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat;

		Also associated with SAC and SPA: rare species including the South Stack fleawort and spotted rock-rose.	Physical and behavioural disturbance to ornithology receptors (breeding/overwintering).
Glannau Rhoscolyn	SSSI	Important biological and geological interest features, both marine and coastal. Coastal cliffs expose polyphase fold structures of national importance. Exposures of pre-cambrian rocks. Coastal and lowland heath with rush pasture and mire. Acidic grassland. Ornithology interests are primarily chough and peregrine. Secondary importance breeding shag, kestrel, raven, whitethroat, wheatear and stonechat.	Behavioural disturbance to ornithology receptors from noise and visual impact.
Holy Island Coast	SSSI	Heathland; Maritime grassland communities; Coastal cliffs and ledges; Vascular plants (*Tephroseris integrifolia* subsp. *Maritima*)	Botanical communities will be a significant consideration in decisions about the siting and location of any onshore development and infrastructure associated with demonstration zone.
Llyn Alaw	SSSI	Llyn Alaw is the largest mesotrophic open water in West Gwynedd (locally important) and is important for teal, shoveler and whooper swan. Other species which use the site includes mallard, wigeon, goldeneye, pochard and tufted duck.	Impacts from onshore construction considered unlikely due to lack of pathway.
Llyn Llywenan	SSSI	Good example of a moderately base-rich locally important lowland lake. A number of rare or uncommon species and overwintering wildfowl.	Impacts from onshore construction considered unlikely due to lack of pathway.
Llyn Garreg-Lwyd	SSSI	Tall fen dominated by common reed. Shallow basin mire formed on the site of an old lake. Floating vegetation and important associated species.	Impacts from onshore construction considered unlikely due to lack of pathway.
LLŷn Maelog	SSSI	Shallow basin eutrophic lake, supports various aquatic vegetation and wintering wildfowl, wader species, breeding waterfowl and freshwater mussels.	No impact anticipated
Llyn Padrig	SSSI	Biological interest, primary as an example of mesotrophic basin mire. Mire development appears to have been relatively undisturbed by artificial drainage.	Impacts from onshore construction considered unlikely due to lack of pathway.

LLŷn Traffwll	SSSI	Small shallow lake, supports overwintering wildfowl (particularly shovler (1% of total) wigeon, mallard, gadwall, goldeneye, pochard and tufted duck) and aquatic flora.	Behavioural disturbance to ornithology receptors from noise and visual impact; Indirect impacts due to impacts/changes to connected hydrological features (considered unlikely). Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting.
Llynnau Y Fali - Valley Lakes	SSSI	A mosaic of open water with associated mesotrophic marshland and damp grassland habitats, including two lakes and a number of smaller bodies of standing water. Important wetland associated habitat and ornithology interests, including shoveler duck, teal, tuffted duck, pochard and golden eye.	Behavioural disturbance to ornithology receptors from noise and visual impact; Indirect impacts due to impacts/changes to connected hydrological features.
Nantanog	SSSI	Geological feature consisting of rock exposures in a ravine and stream section.	Impacts from onshore construction considered unlikely due to lack of pathway.
Newborough Warren	SSSI	Coastal landforms and processes controlling beach and dune development, number of intertidal and coastal features (including sand dunes), supports number of rare plants, insects and bird species. Red squirrels are present in the woodland. Best examples of ancient pillow lavas preserved in Britain.	No impact anticipated
Penrhynoedd Llangadwaladr	SSSI	Exposed rocky coast, sub-maritime grassland, sand dune and dune grassland supporting rare plants and seabird colonies (lesser black-beaked and herring gulls).	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting
Porth Diana	SSSI	Nationally important coastal heath. The heath is exposed to western winds, is developed on a rocky escarpment and contains a distinctive assemblage of plants on thin soils and bare rock areas.	No physical works within the SSSI, therefore no impact on geology or botanical interests predicted.
Porth Diana	SSSI	Coastal heath; Large population of *Tuberaria*	No impact anticipated

Rhoscolyn Coast	SSSI	Geological: polyphase fold structures Biological: Various heathlands; Breeding: *Pyrrhocorax pyrrhocorax* and *Falco peregrinus*, diverse algal communities.	No impact anticipated
Rhoscolyn Reedbeds	SSSI	Area of biological reedbed and tall fen behind small dune ridge.	No impact anticipated
Rhosneigr	SSSI	Excellent example of small scale, geological non-cylindrical folding in an Ordovician greywacke sequence.	No impact anticipated
Rhosneigr Reefs	SSSI	The reef consists of a group of rocks and flanking reefs with extensive areas of intertidal bedrock and sandy sediments, including a high diversity of littoral and shallow sublittoral algae.	Physical effects caused by footprint of any cable landfall cables and cable protection; Effects due to changes in hydrodynamics and sediment processes; Effects of sediment plumes created during construction / scour around devices and cables; Effects on benthic communities of any anti-fouling methods; Effects on intertidal communities due to accidently introduction of invasive alien species.
Skerries	SSSI	Supports largest breeding colony of arctic terns in Wales along with varying terns and gulls.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting.
Tre Wilmot	SSSI	Range of heathland vegetation communities	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat; Physical and behavioural disturbance to ornithology receptors (breeding/overwintering).
Ty Croes	SSSI	Coastal heathland, grassland and associated rock and flush habitats with marsh fritillary butterfly.	No impact anticipated
Tywyn Aberffraw	SSSI	Large and intact calcareous dune system with dune ridges, damp slacks and dune grassland with s shallow	No impact anticipated

		lake and outflow stream. Supports vast range of specialised flora and fauna.	
Valley Lakes	SSSI	Open water areas with mesotrophic marshland and damp grassland habitats. Supports overwintering wildfowl, breeding wetland birds and rich aquatic flora and fauna.	Disturbance; Effects of habitat loss; Collision risk with devices; Indirect effects such as changes to habitat or availability/distribution of prey species; Effects of lighting.
Y Werthyr	SSSI	Wetland environment with relatively intact example of a mesotrophic valley mire or 'poor fen'. Well represented typical habitat.	Impacts from onshore construction considered unlikely due to lack of pathway.
Ynys Feurig	SSSI	Largest tern colony in Wales (500-900 breeding pairs) of roseate, sandwich, common and arctic. Series of islands about 1km out to sea.	Impacts from onshore construction considered unlikely due to lack of pathway.
Arfordir Bwth Corwgl – Bae Trearddur	Local Wildlife Site	A strip of rocky coastland with a mosaic of coastal grassland and coastal heath with areas of bare rock. Including red fescue, thrift, sea plantain, buck's-horn plantain, heather, bell heather, western gorse, purple moor grass, glaucous sedge, rock samphire, sea sandwort, sea lavender, sheep's bit scabious and golden samphire.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat.
Cors Trewilmot	Local Wildlife Site	A valley wetland containing herb-rich, rush dominated fen meadows. Includes bogbean. St. John's wort, bog pimpernel, willow, sedge associations, peat with heather, bog myrtle, cross-leaved heath, common cotton-rass, western gorse, bog asphodel, purple moor grass and bog myrtle.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat.
Chwarel Morglawdd Caergybi	Local Wildlife Site	The site consists of a disused quarry, a small area of dry heathland and a series of small enclosures. It borders the Glannau Ynys Gybi SSSI. Includes important flora and is an important feeding and nesting area for birds including shelduck, oystercatcher, ringed plover and red-breasted merganser.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat; Physical and behavioural disturbance to ornithology receptors (breeding/overwintering).

Rhostir Mynydd Celyn	Local Wildlife Site	Consists of enclosed pastures with a number of low rock outcrops. Grassland forms a mosaic with areas of dry and wet heath amongst bare rock on the outcrops. There are several areas of marsh gentian, which occurs locally in Anglesey and has no other known site in Wales.	Temporary/permanent physical disturbance to onshore coastal habitat and botanical features; Permanent loss of habitat.

8.1.2 Potential Impacts

Table 8-2 Potential impacts on designated sites

Potential Impact	Phase	Anticipated Significance	Comment
Visual impacts to AONB	All	Potential impact significance unknown	The presence of construction activity will have an impact on the undisturbed natural views of the AONB. In particular, views along the coast from the South Stack.
Impacts on sites with terrestrial and geological interest features	All	Potential impact significance unknown	Impacts to coastal protected sites will be dependent on where the landfall is and the nature by which it is installed. Impacts at the landfall would be localised to the area of the installation. Impacts to ecological receptors would be expected to be temporary.
Impacts to terrestrial ecological protected sites	All	Potential impact significance unknown	Impacts to onshore designated sites are expected to be minimal due to the localised nature of impacts arising from the onshore development, although impacts to bird interest features and hydrology dependent features would need to be considered. In addition, coastal terrestrial sites would be considered in terms of coastal processes.
Impacts on designated sites with ornithological interest features	All	Potential impact significance unknown	Offshore construction activity and noise have the potential to displace birds from foraging and resting grounds. The installation of surface and subsurface infrastructure has the potential to result in bird collisions, for example, with diving birds such as gannet and auk species. The placement of structures on the seabed may reduce food availability in foraging areas. The significance of the impact would be dependent on the importance of the MDZ as a foraging area, the species present in the MDZ and the type/frequency of usage within the site and whether birds present in the area are connected to designated site.
Impacts on SAC marine mammal interest features	All	Potential impact significance unknown	The presence of construction vessels and activity associated with construction may result in displacement of marine mammals from foraging areas or from migratory routes. The presence of moving subsea structures may constitute a collision hazard for marine mammals using or passing through the area. The presence of mooring anchors and tethers may also constitute an underwater hazard to marine mammals passing through the MDZ. Underwater noise generated during operation may displace marine mammals from traditional foraging areas and migratory routes. The likely significance of impact on SAC designated populations will be dependent on the importance of the area as a foraging or migration route, and the proximity of the site to SAC designated breeding colonies.
Impacts on designated marine and coastal sites with	All	Potential significance of impact unknown	Benthic ecology features could be influenced by changes in coastal processes, sediment

Potential Impact	Phase	Anticipated Significance	Comment
benthic ecology interest features			transportation or hydrodynamic regimes. The likelihood and significance of the impact would be dependent on the interest features of the site, proximity to the site and the magnitude of changes, if any, to the physical processes baseline condition.

8.1.3 EIA Baseline Characterisation

In order to inform the EIA baseline and HRA, data gathering will focus on:

- Defining the importance of the Project area for ornithological, marine mammals and wider ranging ecological features, and to determine connectivity with designated sites. It is likely that this data gap will need to be addressed through a review of existing literature and undertaking of ecological studies.
- Identifying the impact of the Project on the Anglesey and Holyhead Mountain AONB. It is likely that this would need to be done through a seascape and landscape visual impact assessment (SLVIA).
- Identifying benthic and coastal sites, including far field if appropriate, that may be influenced by changes in physical processes. This would crossover with data from the physical processes section of the EIA to identify potential changes to processes and a literature review to identify sensitive designated site interest features.

8.2 Benthic Ecology

The following section outlines the benthic subtidal and intertidal ecology of the offshore scoping area and adjacent area. Habitat mapping is based on predicted presence; therefore, biotopes within the area adjacent to the offshore scoping area may be present within the offshore scoping area and have been included in the baseline conditions for completeness.

8.2.1 Baseline

8.2.1.1 Subtidal Ecology

It is generally considered that sediment types of the west coast are typically medium to coarse, consisting of mainly gravel and sand, with a low proportion of mud and clay sediments[38].

Table 8-3 shows the predicted biotopes in and around the offshore scoping area, based on data from the NRW HabMap[39]. Biotopes are typically characteristic of those found on sandy/gravelly substrate and in mobile, well swept environments. A map of biotopes and their predicted locations are shown in Figure 8-2.

[38] *National Resources Wales (2015) Checklist for Tidal Demonstration Zone West of Holy Island, Anglesey.*

[39] *NRW Habmap https://data.gov.uk/dataset/habitatmapping-for-conservation-and-management-of-the-southern-irish-sea-habmap-gis-dataset (accessed January 2018)*

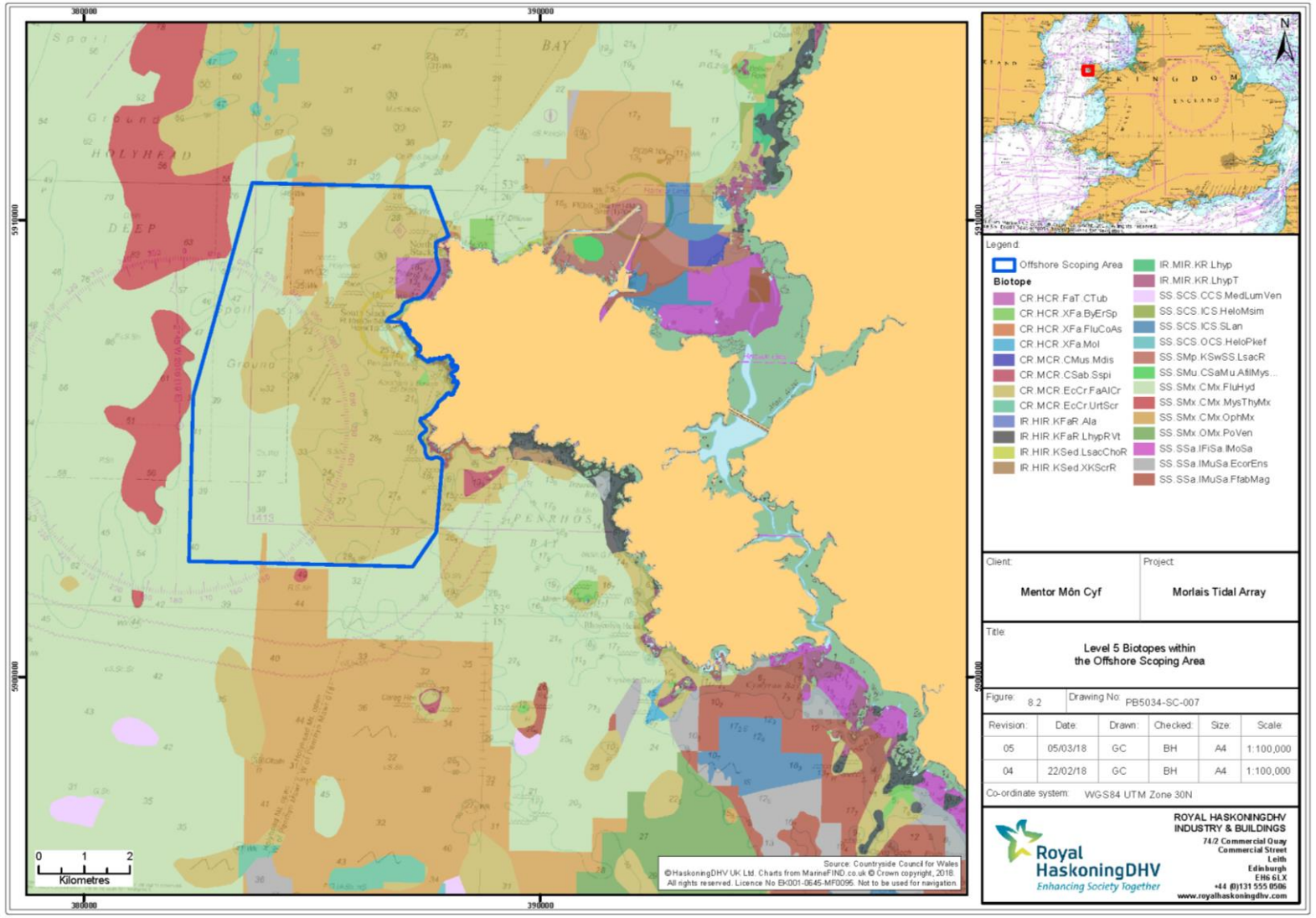


Figure 8-2 Level 5 Biotopes within the offshore scoping area

Benthic communities typically consist of common polychaete, crustacean, mollusc or echinoderm based. The HabMap data shows that these biotopes are typically common in the Anglesey area and wider Welsh coastal area.

Habitats in the region of the offshore scoping area have been described as having low or medium sensitivity to marine energy developments[40] . There are no SAC or Annex 1 habitats identified within the offshore scoping area; however, it is noted that there is the potential for *Sabellaria alveolata* and *Modiolus modiolus* reef to be present.

Table 8-3 Predicted Level 3 Biotopes (based on biotope presence)

Description	Biotope Present	Presence in offshore scoping and adjacent area
Very tidal swept faunal communities	CR.HCR.FaT	Patchy
Mixed faunal turf communities	CR.HCR.XFa	Patchy
Circalittorial mussel beds	CR.HCR.CMus	Patchy
Circalittorial *Sabellaria* reefs	CR.HCR.Sab	Patchy
Echinoderm and crustacean community	CR.MCR.EcCR	Widespread
Kelp with cushion fauna and/or foliose red seaweed	IR.HIR.KFaR	Patchy, mainly to north of scoping area
Kelp and red seaweeds (moderate energy infralittorial rock	IR.MIR.KR	Patchy restricted to coastal area at landfall
Polychaete worm reefs on sublittorial sediment	SS.SBR.PoR	Patchy but widespread.
Sublittorial mussel beds (on sublittorial sediment	SS.SBR.SMus	Patchy but widespread, more common offshore
Circalittorial Gravel and Coarse Sands	SS.SCS.CCS	Widespread
Infralittorial Coarse Sediment	SS.SCS.ICS	Widespread
Kelp and seaweed (on Sublittorial Sediment).	SS.SMp.KSwSS	Widespread
Circalittorial sandy mud	SS.SMu.CSaMu	Uncommon and patchy
Infralittorial sandy mud	SS.SMu.ISaMu	Widespread along welsh coast but uncommon near offshore scoping area
Circalittorial mixed sediment	SS.SMx.CMx	Widespread
Infralittorial mixed sediment	SS.SMX.IMx	Generally widespread but patchy around Holy Island
Circalittoral Fine Sand	SS.SSa.CFiSa	Patchy
Infralittorial muddy sand	SS.SSa.IMuSa	Present to the northwest of Holy Island

8.2.1.2 Intertidal Ecology

Anglesey has extensive areas of important, relatively undisturbed intertidal habitat.

The area of the likely export cable route landfall is an area of high energy rocky shore and sea cliff, bordered by coastal heathland and rough grazing.

[40] *Smith K, Briggs J, Hamer J, Hill A and Walker P (2011). Natural heritage evidence to support strategic planning for marine renewable energy. CCW Policy Research Report No. 11/3.*

In general, the west coast of Anglesey has substantial length of exposed shores which are largely coastal cliff headlands interspersed with beaches of moderately coarse sediment. Consideration will be given to impacts from changes to coastal processes (Section 7.1) which could affect this coast due to cable route and offshore installations.

8.2.2 Potential Impacts

Table 8-4 Potential impacts on benthic ecology

Potential Impact	Phase	Anticipated Significance	Comment
Impacts to benthic communities due to changes in sediment regime	All	Significance of impact unknown	Changes to sediment processes could result in either increased sedimentation through a reduction in tidal energy that may smother benthic communities or increased removal of sedimentation through scour that could change sediment conditions for subtidal or intertidal benthic communities.
Loss of habitat due to infrastructure footprint	All	Significance of impact unknown	The overall loss of habitat will be dependent on the footprint of the infrastructure being installed and the construction methods used. The significance will also be dependent on which biotopes are present and the relative importance of biotopes that are being lost. The footprint of TEC devices would include swept areas from anchors, tethers and moorings.
Impact to benthic communities due to the creation of sediment plumes during construction	Construction	Effect unlikely to be significant.	Sediment plumes can be created during piling and ground preparation activities. Sediment plumes, when they resettle, have the potential to smother benthic communities. The level of significance would depend on the on the sensitivity of local benthic habitat to smother as well as the nature of sediment dispersal at the installation site.
Disturbance of contaminated sediments	Construction	Effect unlikely to be significant	The disturbance of sediment during construction activities may also release contaminants incorporated in seabed sediments. Released contaminants can become incorporated into benthic communities, and in particular, filter feeders. The

Potential Impact	Phase	Anticipated Significance	Comment
			site is likely to be at a low risk of contamination and the presence of sediment is extremely limited.
Introduction of invasive species	All	Potential impact significance unknown	There is the potential for alien species to be introduced into the development area through being transported to site by vessels. In addition, there is the potential for alien species distribution to spread through use of renewable developments as 'stepping stones'. This will be considered further in cumulative impacts.
Impact to benthic communities from cable installation	Construction	Potential significance unknown	Cable installation could result in direct loss/alteration of habitat and potential smothering of adjacent habitats. However, the high energy nature of the site makes this unlikely as a result of natural dispersion.
Impact to benthic communities from EMF or thermal load from export and inter array cables	Operation	Potential significance unknown	Research into the effects of EMF and thermal load has suggested that the impacts from cables are unlikely to have an impact on benthic communities, however, relatively little is known about the potential effects of EMF and thermal load.

8.2.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Confirming the presence of biotopes predicted by the HabMap data. This would be based on a review of available survey data and potential ground truthing through ecology characterisation surveys.
- An assessment of any nationally important BAP marine habitats and/or species that may be affected.
- The likely nature of impacts to coastal processes, the spatial extent of impacts and the likely impact that this may have on benthic receptors.
- The identification of benthic receptors sensitive to smothering and disturbance.
- The confirmation that there are no Annex 1 habitats within the proposed MTA development area.
- An assessment of the intertidal habitats present in or around Penrhos Feilw, including an assessment of the CCW Phase 1 intertidal habitat survey data, as available.
- A greater level of detail will be gathered to assess the impact on changes to coastal processes on the intertidal ecology of west Anglesey. This would be done through conceptual modelling that would be undertaken as part of the Metocean Conditions and Coastal Processes chapter (Section 7.1) and potentially an intertidal survey of the area.

8.3 Marine Mammals, Basking Sharks and Reptiles

8.3.1 Baseline

8.3.1.1 Marine Mammals

A number of marine mammals have been recorded in the waters around North Wales and Anglesey with the main species being harbour porpoise, bottlenose dolphin, minke whale, and grey seal[41].

Survey data gathered between 1990 and 2007[42] shows that harbour porpoise are the most abundant species around Anglesey and are abundant all year round with typically 1 to 2.5 animal encounters per hour.

The bottlenose dolphin population of the Cardigan Bay SAC is known to move around the Welsh coast[43] and there is a hot spot of bottlenose dolphin activity recorded around the east coast of Anglesey and north coast of Wales up to Conway and Llandudno. Seawatch Fountation data[43] shows that the offshore scoping area has a low encounter rate of less than 0.1 encounters per hour in comparison to 1-2 encounters per hour in areas of Cardigan Bay. Encounter rates for common dolphin and minke whale are both less than 0.01 encounters per hour. It is also noted that Risso's dolphin are occasionally recorded in high numbers around Anglesey[44].

Grey seals are commonly observed around the coast of Anglesey, and although there is no specific breeding population, there is a haul out site on Puffin Island off the east coast of Anglesey, with up to 100 individuals recorded[45] and records of small numbers of individuals pupping in isolated locations around the coast. Pups are born in autumn in scattered locations, but sea caves and gullies around the North Stacks and Skerries are noted as favourable locations. Grey seals around Anglesey have been associated with the Pen Llŷn a'r Sarnau SAC, Cardigan Bay SAC and Pembrokeshire Marine SAC. Harbour seals are not commonly recorded around the coast of North Wales. Figure 8-3 shows grey seal densities recorded around the offshore scoping area and shows moderate use of the offshore scoping area in comparison with the surrounding areas. Figure 8-4 shows harbour seal abundance in the area and shows low densities in the offshore scoping area and surrounding Irish Sea.

[41] *Baines ME and Evans PGH (2012). Atlas of the marine mammals of Wales. Countryside Council for Wales Marine Monitoring Report No. 68 2nd Edition.*

[42] *Evans, P. & Baines (2009) Mapping marine mammal distributions for conservation management. http://seawatchfoundation.org.uk/wp-content/uploads/2012/08/ECS-peter_poster_2010.pdf*

[43] *Pesante G, Evans PGH, Baines ME and McMath AJ (2008b). Abundance and life history parameters of bottlenose dolphin in Cardigan Bay: Monitoring 2005-2007. CCW Marine Monitoring Report No. 61b.*

[44] *National Resources Wales (2015) Checklist of Natural Heritage Tidal Stream energy demonstration zone West of Holy Island, Anglesey.*

[45] *Westcott SM and Stringell TB (2004). Grey seal distribution and abundance in North Wales, 2002-2003. CCW Marine Monitoring Report No.13.*

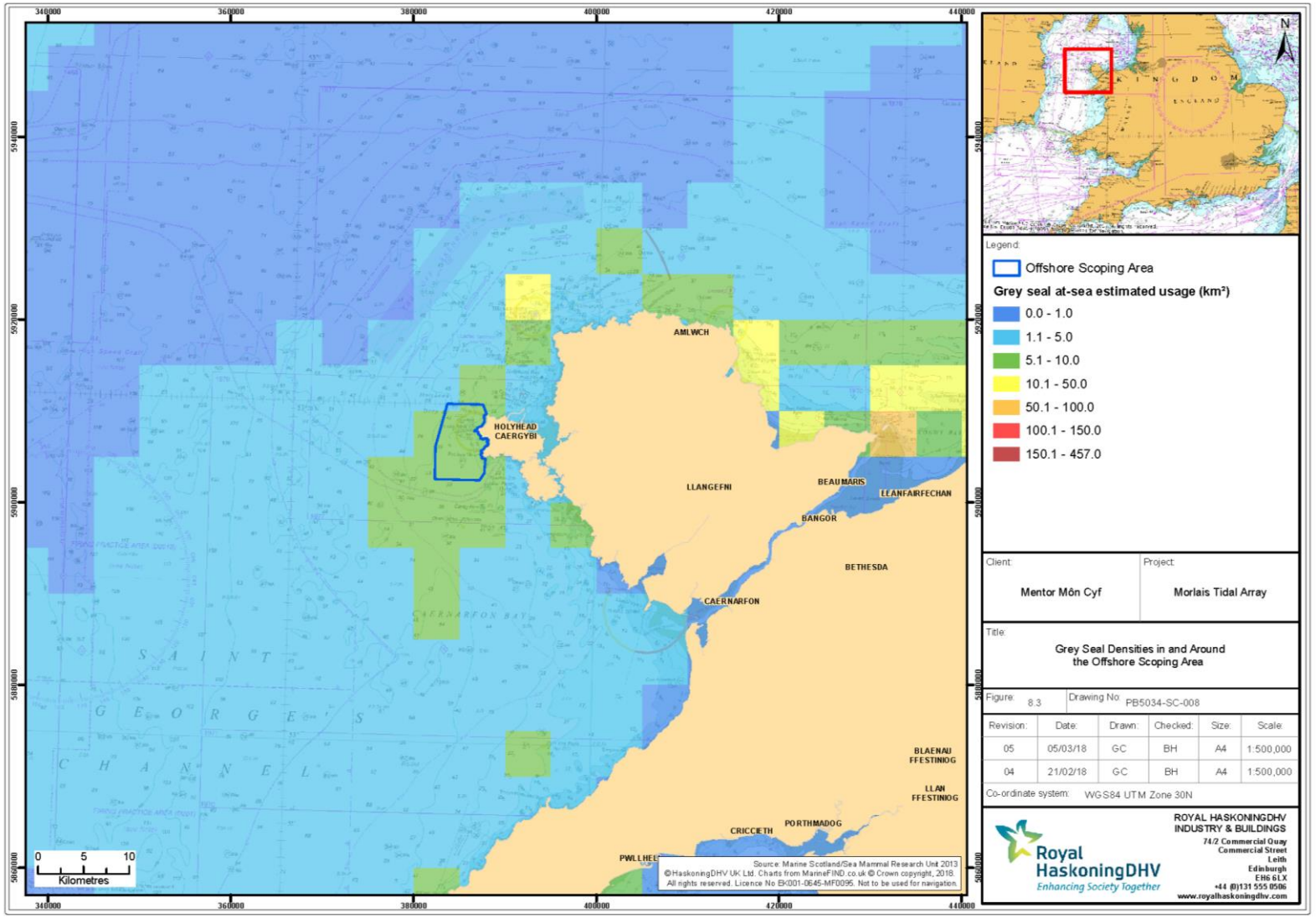


Figure 8-3 Grey seal densities in and around the offshore scoping area

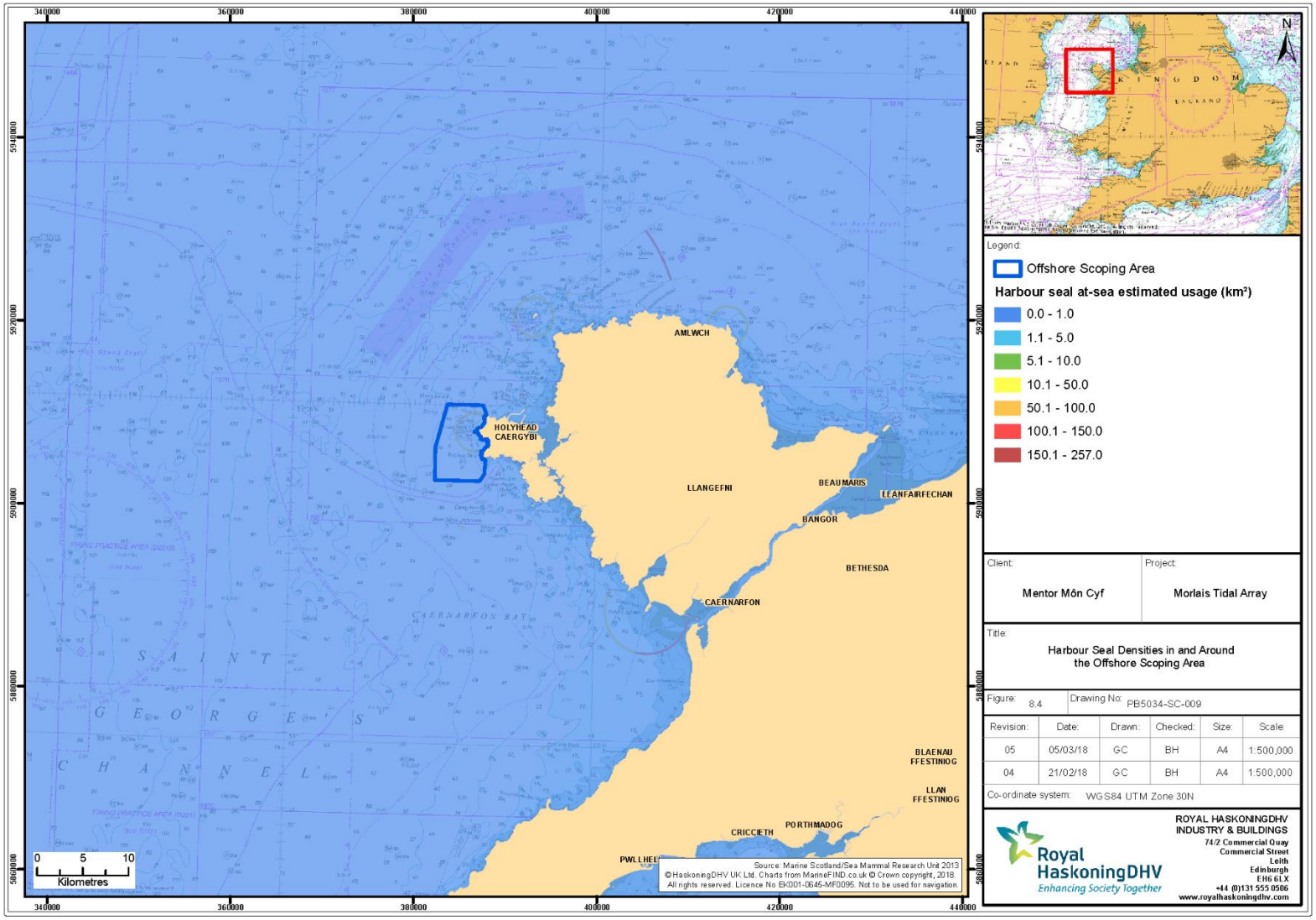


Figure 8-4 Harbour seal densities in and around the offshore scoping area

8.3.1.2 Basking Shark

Basking sharks are not commonly recorded along the coast of Wales. Long term sighting data between 1987 and 2006 [46] recorded seven sightings around Anglesey and the adjacent offshore area. Basking shark sightings generally follow a low-density pattern throughout the Irish Sea, although the Isle of Man; to the north is a particular hot spot for basking sharks.

8.3.1.3 Reptiles

Leatherback turtles are occasional visitors to the Irish Sea, recorded during summer months and are often associated with jelly fish blooms. Between 1950 and 2005, there were three recorded sightings around the Anglesey Coast[47].

8.3.2 Potential Impacts

Table 8-5 Potential impacts on marine mammals, basking sharks and reptiles

Potential Impact	Phase	Anticipated Significance	Comment
Disturbance and displacement of marine mammals and basking sharks from key habitats by underwater noise.	All	Potential impact significance unknown	Underwater noise levels during marine renewable installation are a key concern for marine mammals and have the potential to result in displacement from key habitats or migratory routes, or in extreme cases physical injury to individuals. Basking sharks are uncommon in the scoping area and unlikely to have areas of importance or set migratory routes through the scoping area. Operational noise from devices could also have the potential to displace mammals from the immediate vicinity, although these noise levels would be much lower than those during the construction phase.
Marine mammal collision and entanglement with marine infrastructure	Operation	Potential impact significance unknown	By their nature, marine mammals tend to be wide ranging. There is a potential for devices mounted or tethered to the seabed to act as an obstruction to marine mammals passing through the MDZ. The potential risk of collision and entanglement will be dependent on importance of the site and frequency of use of the site, either as a migratory route or foraging zone.

[46] *Bloomfield, A & Solandt, J-L, (2006). The Marine Conservation Society Basking Shark Watch, 20-year report (1987-2006). Marine Conservation Society.*

[47] *INTERREG (2006) Irish Sea Leatherback Turtle Project- Populations, Origins and Behaviour. INTERREG IIIA Initiative 2003-2006*

Potential Impact	Phase	Anticipated Significance	Comment
Marine reptile and basking shark collision and entanglement with marine infrastructure	Operation	Effect unlikely to be significant	Turtles and basking sharks are uncommon in the offshore scoping area and are likely to be passing through when recorded. Due to the uncommon nature of these species in the offshore scoping area, the risk of collision and entanglement is expected to be low.
Collision with vessels	All	Potential impact significance unknown	With an increased amount of vessel activity within the MDZ there is an increased risk of collision between marine megafauna and vessels. Marine mammals, due to their relative abundance, are at greater risk than basking sharks and turtles which are both uncommon within the scoping area. Vessel movement will be at its most intense during construction with fewer vessels operating during operation. The significance of the impact will be dependent on the level of usage of the MDZ by marine mammals and the numbers of vessels active during construction.
Contamination from accidental fluid release	All	Effect unlikely to be significant	Through the following of industry standard best practice guidelines it is considered that accidental contamination will not be a significant impact.

8.3.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Species presence to identify which species are present in the offshore scoping area. This would be done through a review of existing literature and local sightings records, e.g. Seawatch Foundation.
- Spatial and temporal abundance and distribution of marine mammals within the offshore scoping area to determine the relative importance of the site to marine mammals. This would be done through a review of existing literature and studies and analysis of marine mammal survey data (see below).
- Analysis of marine mammal surveys which have been undertaken alongside the offshore ornithological surveys by a qualified and experienced marine mammal surveyor.
- Analysis of two years of marine mammal surveys using vantage point and Passive Acoustic Monitoring (PAM) methodologies.
- A thorough literature review of turtles and basking shark recordings to determine frequency and distribution of sightings within the offshore scoping area.

- Determine underwater noise baseline conditions, this would be done by a specialist underwater noise specialist who would produce a technical report of baseline conditions.
- Determination of collision risk. This would be addressed through a literature review of similar studies and results from studies such as the SeaGen and the MeyGen projects.

8.4 Fish and Shellfish Ecology

This section discusses the fish and shellfish populations found within the offshore scoping area. There is a limited amount of site-specific information available, so literature from the wider Anglesey area has been used to infer likely populations within the offshore scoping area.

8.4.1 Baseline

8.4.1.1 Marine Fish

The offshore scoping area is likely to consist mainly of high energy sandy, gravelly habitats with areas of rocky habitat towards coastal areas. Nearby sites (Skerries) report that blennies, gobies, bullheads and rockling are present around Anglesey coastal waters and larger species such as conger eel, topknot, ling, wrasse, pollock, gurnard and John Dory are also likely to be present[48].

Flat fish are also commonly recorded in the wider Liverpool Bay/North Wales coastal area. The most common species are typically plaice and dab; however, species such as turbot and thornback rays are also recorded along with dogfish, tope and greater spotted dogfish[49].

In terms of pelagic species, herring, sprat, mackerel, scad and sandeels are widely distributed throughout the Irish Sea, including within the offshore scoping area. although sand eels are likely to be restricted in their distribution to sandy areas[50].

Figure 8-5 and Figure 8-6 show nursery grounds for sole, plaice, cod, tope, thornback/spotted ray, sandeel, mackerel and whiting. The figures indicate that the offshore scoping area is not an important spawning area and experiences low intensity use by tope, thornback/spotted ray and whiting. Figure 8-7 and Figure 8-8 shows spawning grounds for sandeel, plaice, whiting, lemon/dover sole, cod, mackerel, ling and hake. The figures indicate that the offshore scoping area is not a specific spawning area and is subject to low intensity use by all species but ling and hake[51,52].

[48] PMSS (2011). Skerries Tidal Stream Array EIA. RWE.

[49] *Starida Recreational Angling www.starida.co.uk/index.php/fishing (accessed January 2018)*

[50] Pawson, M & Robson, C *in* Barne, J.H., Robson, C.F., Kaznowska, S.S., Doody, J.P., & Davidson, N.C., *eds*. 1996. C*oasts and seas of the United Kingdom. Region 13 Northern Irish Sea: Colwyn Bay to Stranraer, including the Isle of Man.* Peterborough, Joint Nature Conservation Committee.

[51] Coull, K.A., Joh nstone, R., and Rogers, S.I. 1998. Fisheries Sensitivity Maps in British Waters. Published and distributed by UKOOA Ltd., v + 58 pp.

[52] Ellis, J. R., Milligan, S., Readdy, L., South, A., Taylor, N. and Brown, M. 2010. Mapping spawning and nursery areas of species to be considered in Marine Protected Areas (Marine Conservation Zones). Cefas, Lowestoft.

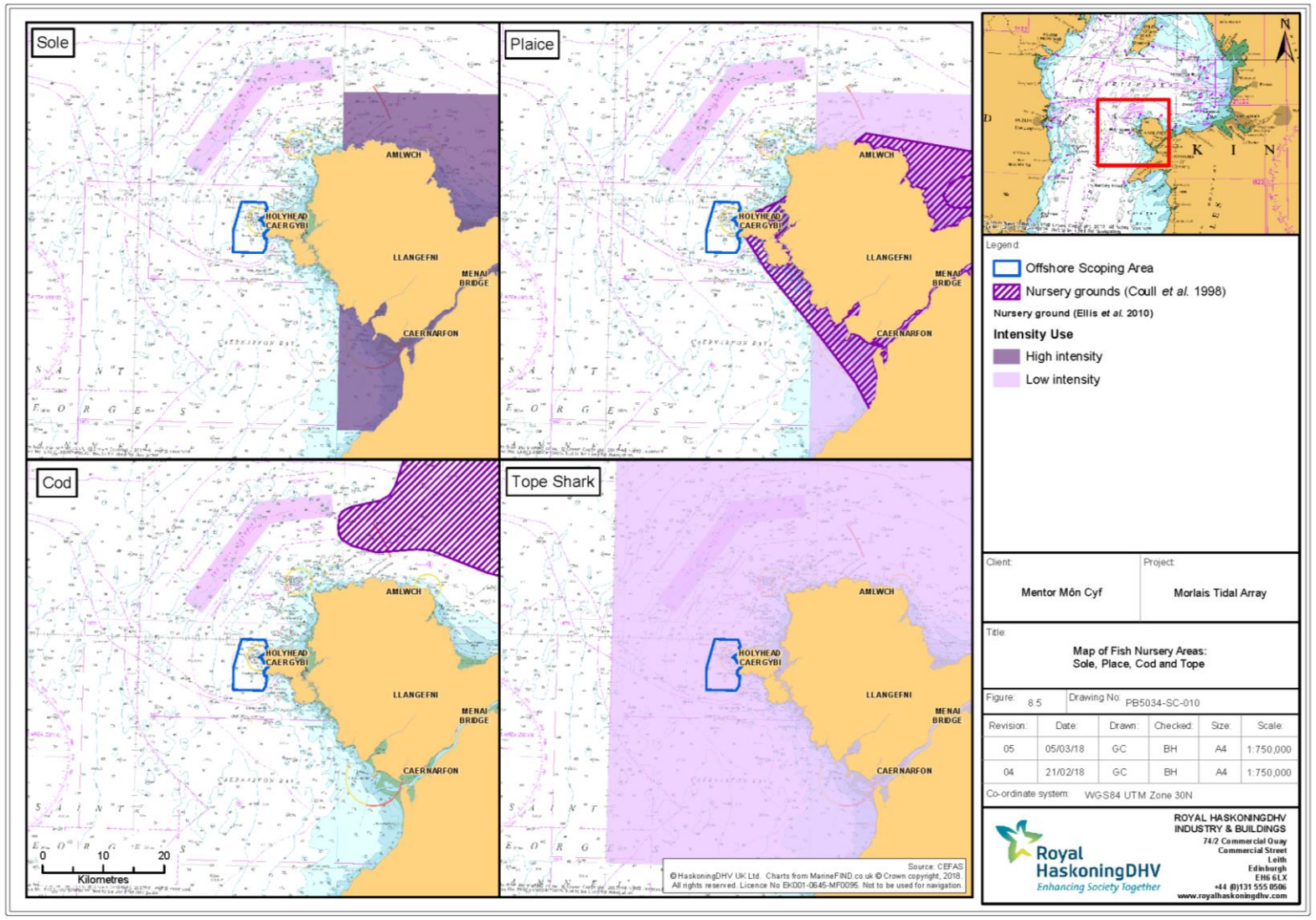


Figure 8-5 Map of fish nursery areas: sole, place, cod and tope

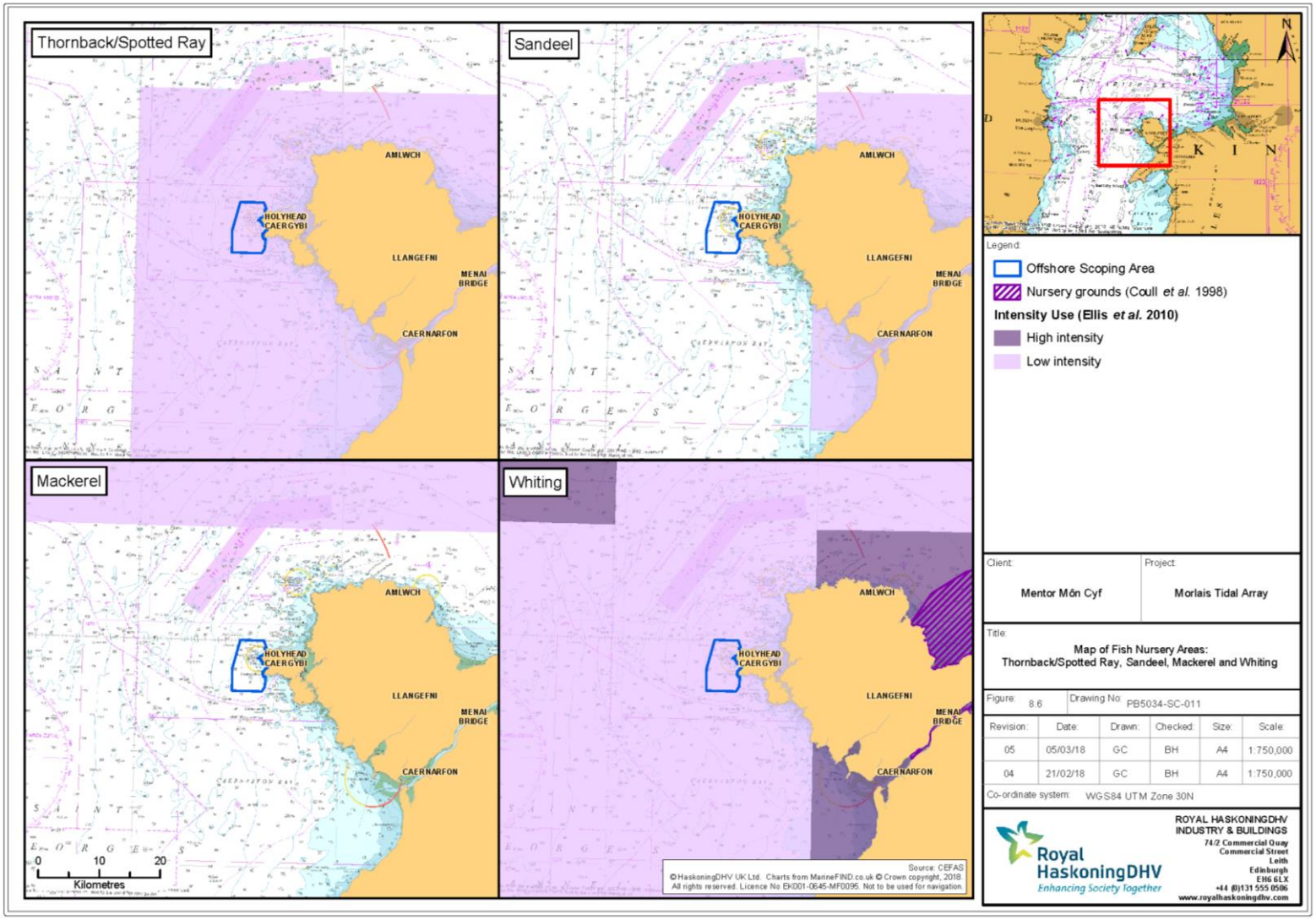


Figure 8-6 Map of fish nursery areas: thornback/spotted ray, sandeel, mackerel and whiting

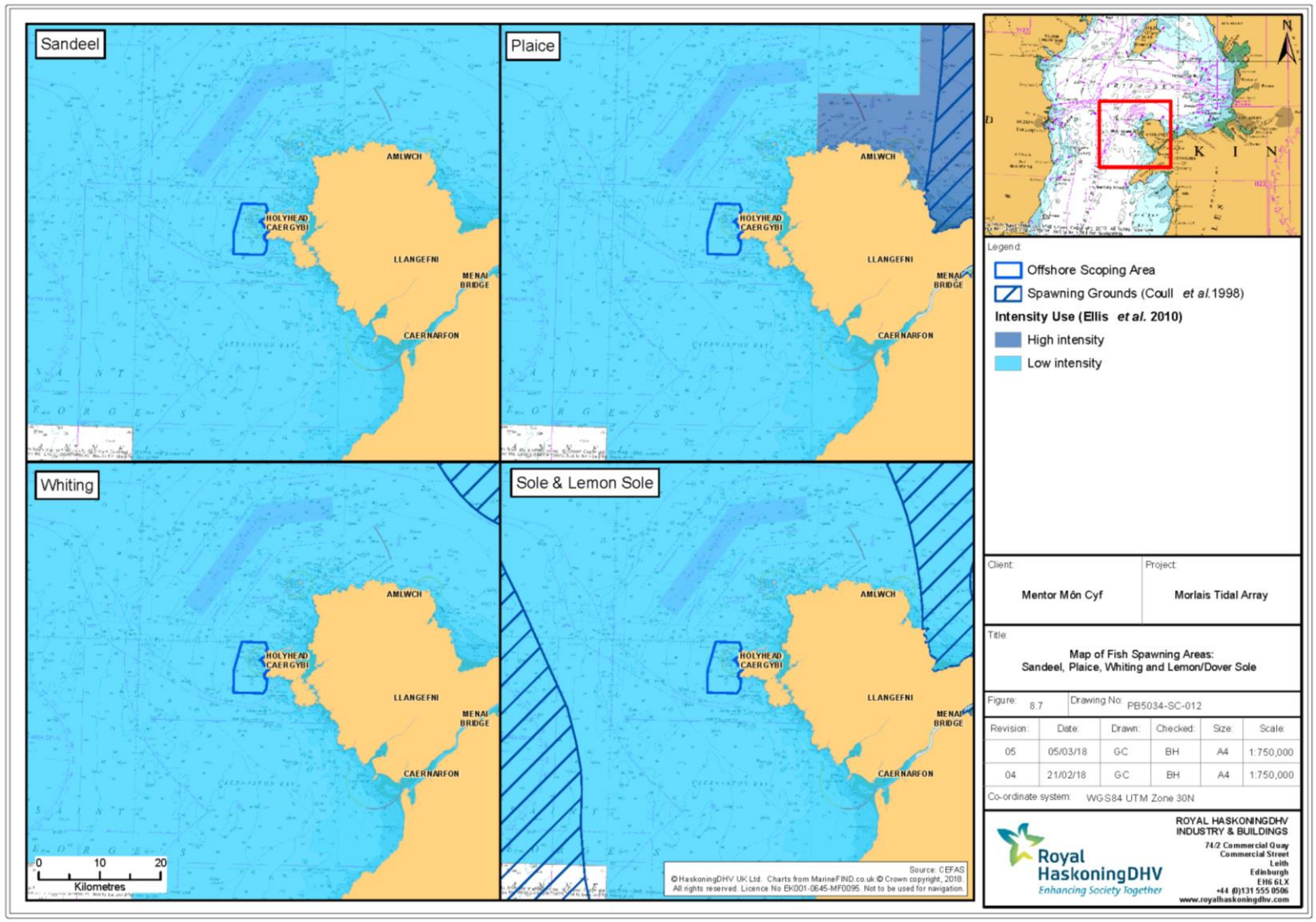


Figure 8-7 Map of fish spawning areas: sandeel, plaice, whiting and lemon/dover sole

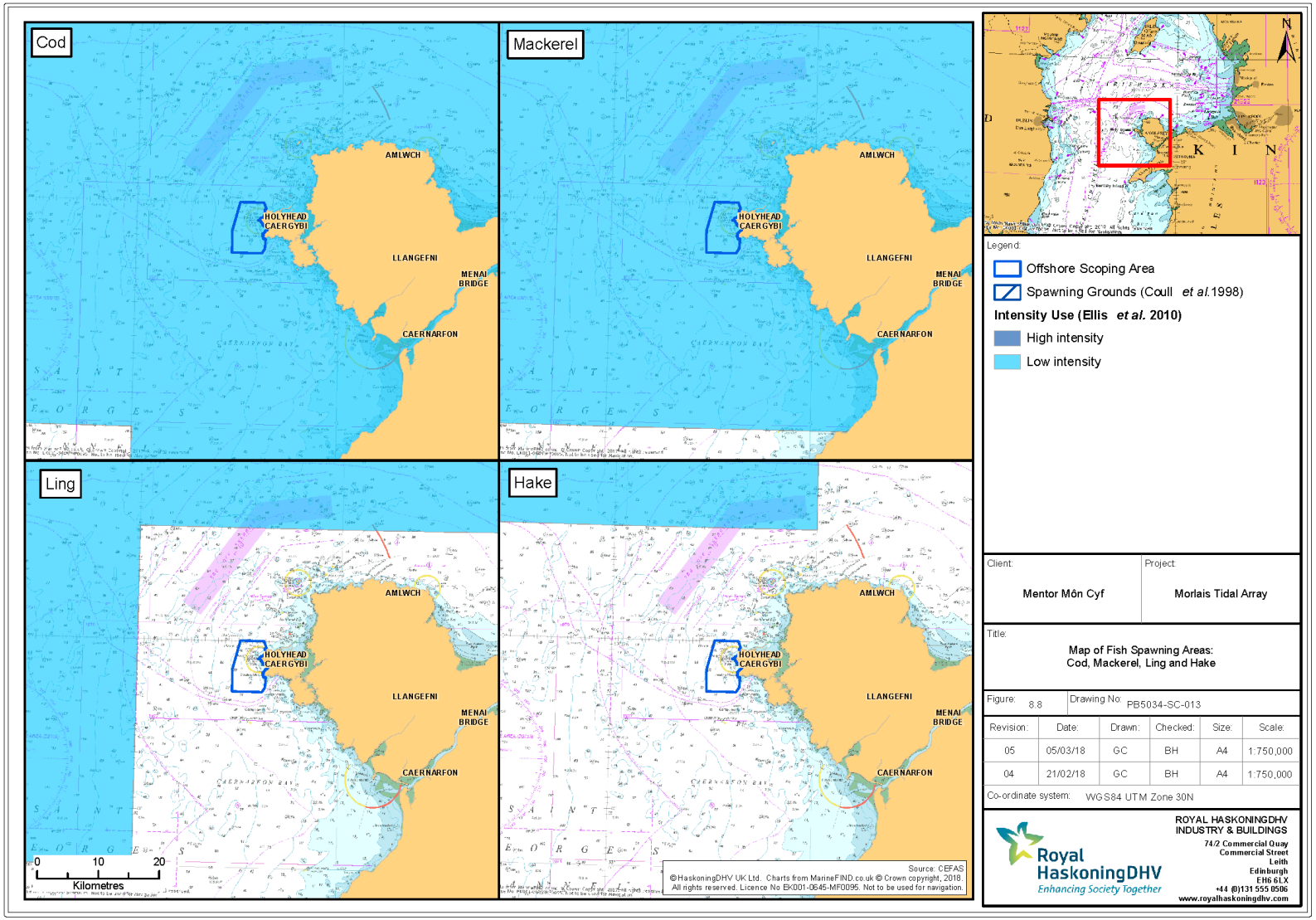


Figure 8-8 Map of fish spawning areas: cod, mackerel, ling and hake

8.4.1.2 Shellfish

Fishing records from Holyhead show that shellfish are the only commercial species landed at the harbour. However, none of the registered vessels are licenced for scallop fishing, suggesting that scallops are uncommon within the offshore scoping area. In addition, scallops are known to be common in the wider Irish Sea area. Within the offshore scoping area and adjacent area, the most likely shellfish species are likely to be brown crab, spider crab, lobster and mussels. Within the wider Anglesey area, scallops, oyster, langoustines, brown shrimp, cockles, winkles and clams are also fished and supplied to local businesses[53]

8.4.1.3 Migratory Fish

The offshore scoping area has the potential to be located within a transitory route for several migratory species including bass, salmon and sea trout[54]. In addition, shad and lamprey are interest features in several relevant SACs (Section 8.1).

Table 8-6 shows sites designated for migratory fish which have the potential to transit through the offshore scoping area.

Table 8-6 Relevant SACs designated for migratory fish

Designated Site	Interest Feature
River Dee and Bala Lake SAC	River lamprey, sea lamprey and Atlantic salmon
Dee Estuary SAC	River lamprey, sea lamprey
Afon Eden Cors Goch Trawsfynydd SAC	Atlantic salmon
Afon Gwyrfai a Llan Cwellyn SAC	Atlantic salmon
Cardigan Bay SAC	River lamprey, sea lamprey.

The west coast of Holy Island, including Rhosneigr and the surrounding areas, is often reported as a popular fishing location for bass[55]. Sea trout fishing is also reported in the coastal waters around Anglesey[56].

Once migratory fish leave their freshwater river and enter open water, it is difficult to ascertain their migratory routes to sea. There is little information available to determine likely migratory routes or abundance for migratory species which may be transiting through the offshore scoping area.

8.4.2 Potential Impacts

Table 8-7 Potential impacts on natural fish and shellfish

Potential Impact	Phase	Anticipated Significance	Comment
Disturbance to demersal fish	Construction	Potential impact significance unknown.	Construction activities that disturb seabed habitats have the potential to disturb demersal fish. The significance of the impact would be dependent on construction methods and project design.
Loss of shell fish habitat	All	Potential impact significance unknown	Loss of habitat through placement of devices and

[53] *MJ White Fishmongers, http://www.mjwhitefishmongers.co.uk/ (Accessed January 2018)*

[54] *National Resources Wales (2015) Checklist of Natural Heritage Tidal Stream energy demonstration zone West of Holy Island, Anglesey.*

[55] *Rhosneiger tourist information; www.rhosneigr.org.uk/Activities/SeaFishing.html (accessed January 2018)*

[56] *Celtic Sea Trout Project (2011) http://celticseatrout.com/project-updates/willow/ (accessed January 2018)*

Potential Impact	Phase	Anticipated Significance	Comment
			swept area of mooring cables has the potential to remove habitat for shellfish. The significance of this would be dependent on the final project design and the importance of the area for shellfish.
Impacts on fish and shell fish through a decrease in water quality	Construction	Potential impact significance unknown	Construction methods that create sediment plumes also have the potential to release contaminants (if present) in to the water column. This could result in decreased water quality that could impact on the health of fish and shell fish populations and potentially impact on the quality of commercial species. The significance of the impact will depend on the construction methodology, the presence of contaminants and the abundance of species in the offshore scoping area.
EMF as a barrier to migratory fish	Operation	Potential impact significance unknown	Research into the impacts of EMF as a barrier effect is still not conclusive about the impacts, although work is currently ongoing to look at the impacts on migratory salmon in Scotland. EMF emissions from electrical infrastructure could cause a barrier effect for fish migrating through the scoping area to and from open water.
Impacts on migratory fish from underwater noise	All	Potential impact significance unknown	Underwater noise from construction has the potential to displace migratory fish from their migration routes if this passes through the offshore scoping area during construction. During the operational period, noise levels are expected to be significantly lower than those during construction. The sensitivity of migratory fish to underwater noise is not well documented and migratory pathways of migratory fish are not well understood once individuals leave the river.
Migratory (and non-migratory) fish collision risk with devices	Operation	Effect unlikely to be significant	Although migratory pathways are not well understood it

Potential Impact	Phase	Anticipated Significance	Comment
			would be expected that there would be a low density of fish transiting through the offshore scoping area. Collision of non-migratory species is a potential impact, and more information is required in order to assess potential impacts.
Resource availability through loss of habitat	All	Potential significance of impact unknown	The loss or alteration of habitats within the development have the potential to impact on resource availability and prey distribution within the offshore scoping area. The significance of the impact will be influenced by the extent of any change to benthic habitats and the importance of those areas as a resource.

8.4.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Understanding natural fish population species presence and distribution within the offshore scoping area. This would be done through a review of existing literature, existing environmental data such as bathymetric data and site-specific survey.
- Understanding likely usage and density of migratory fish within the scoping area. This would be done through literature review of available information and consultation with local recreational anglers.

8.5 Ornithology

This section outlines ornithological interests within the offshore and onshore scoping areas. Due to the wide-ranging nature of ornithology interests, a wider search area has been included to include birds that forage considerable distances.

The list of SPAs with interest features that will be considered are provided in Section 8.1.

8.5.1 Baseline

8.5.1.1 Onshore Ornithology

The onshore scoping area and Holy Island in general is a mix of agricultural grazing land, grass land, scrub, maritime heath and semi-urban areas on the east side. The South Stack Cliffs RSPB Nature Reserve extends inland and includes Holyhead Mountain. The South Stack Cliffs RSPB Nature Reserve is important for breeding choughs, with approximately ten pairs[57]. Peregrines are also regularly recorded in the South Stack Cliffs RSPB Nature Reserve.

Species recorded in inland Holy Island and wider Anglesey areas include:

- Stonechat;
- White throat;
- Kestrel; and
- Wheatear.

8.5.1.2 Coastal and Offshore Ornithology

The Irish Sea around Anglesey is used by a wide number of seabird species, including coastal and offshore birds. As the MDZ area is 0.5km from shore, there is the potential for both offshore species and coastal species to be present in the scoping area. The nearby Island Coast SPA and Ynys Fuerig, Cemlyn and the Skerries SPA are breeding areas for sandwich, roseate, arctic and common terns, with puffin, shag and red breasted merganser being interest features of SSSIs associated with the SPAs. The offshore scoping area is within foraging distances of these species therefore there is potential for individuals from these sites to be present within offshore the scoping area[5838].

Immediately adjacent to the scoping area is the South Stack Cliffs RSPB Nature Reserve (detailed above) which provides nesting sites for seabirds, including puffins, guillemots, razorbills, kittiwake and fulmar. Anglesey itself is not noted to be of importance to wintering seabirds; however, Liverpool Bay and Caenerfon Bay are important areas for wintering seaduck and diving species[59].

There are several SPAs (Liverpool Bay, Dee Estuary, Traeth Lafan, Puffin Island, Dyfi and Grassholm) around Liverpool Bay which are important areas for manx shearwaters, puffins and lesser black-baked gull. The offshore scoping area is within foraging distance of these sites and therefore potentially used as a foraging area. In addition, manx shearwaters from the Aberdaron Coast and Bardsey Island SPA may be present within the offshore scoping area.

Fulmar, cormorant, black headed gull, great black backed gull, kittiwake and guillemot are all Amber List species, and herring hull is a Red List species. These species are also UK Biodiversity Action Plan (BAP) species and have breeding colonies within foraging distance of the offshore scoping area. In particular, the

[57] *RSPB South Stack Cliffs https://www.rspb.org.uk/reserves-and-events/reserves-a-z/south-stack-cliffs (accessed February 2018)*
[58] *National Resources Wales (2015) Checklist of Natural Heritage Tidal Stream energy demonstration zone West of Holy Island, Anglesey.*
[59] *PMSS (2011). Skerries Tidal Stream Array EIA. RWE.*

cliffs of South Stack provide nesting sites for large numbers of puffin, razorbills and guillemots (as well as choughs and peregrine falcons)[48].

The importance of the offshore scoping area as a foraging area is currently unknown; however, it is anticipated that important prey species such as sand eel, herring and sprat have the potential to be present within the offshore scoping area.

The north and west coast of Holy Island between Holyhead and Porth Dafarch is within the Gannau Ynys Gybi SPA. The SPA overlaps with the South Stack Cliffs RSPB Nature Reserve. The scoping area encompasses areas of both the SPA and RSPB reserve.

The Holy Island SPA is designated for breeding and wintering chough (*Pyrrhocorax pyrrhocorax*). Species of importance within the RSPB reserve are as follows:

- Chough (breeding and over wintering), typically present foraging in surrounding grazing land;
- Guillemot (*Uria aalge*) (breeding) typically present nesting on cliffs between March and July, onshore range is limited to coastal strip;
- Peregrine falcon (*Falco peregrinus*) (resident) most commonly recorded in the coastal strip, particularly around nesting seabird colonies on the cliffs; and
- Razorbill (*Alca torda*) (breeding) typically present nesting on cliffs between March and July, onshore range is limited to coastal strip.

The grid connection route to the Valley grid connection option crosses the Beddmanarch and Cymyran SSSI. This SSSI contains mudflat and sandbanks which are used by wading birds in the area, including[60]:

- Cormorant;
- Shag;
- Black headed gull;
- Ringed plover;
- Curlew; and
- Oyster catcher.

This site is also used by migrating species during the winter, including:

- Brent geese;
- Red necked grebe;
- Great northern diver;
- Red breasted merganser; and
- Golden eye.

Two years of monthly offshore ornithological surveys commenced in November 2016. Figure 8-9 shows the survey area. These boat-based surveys have been undertaken using an adapted European Seabirds at Sea (ESAS) methodology for tidal development sites. This adapted methodology places greater emphasis on recording the activity of seabirds on the water, particularly for those diving species identified as being vulnerable to 'wet' renewable technologies.

[60] *Kehoe Country Side http://www.kehoecountryside.com/penrhos-coastal-park/habitats-landscape/ (accessed January 2018).*

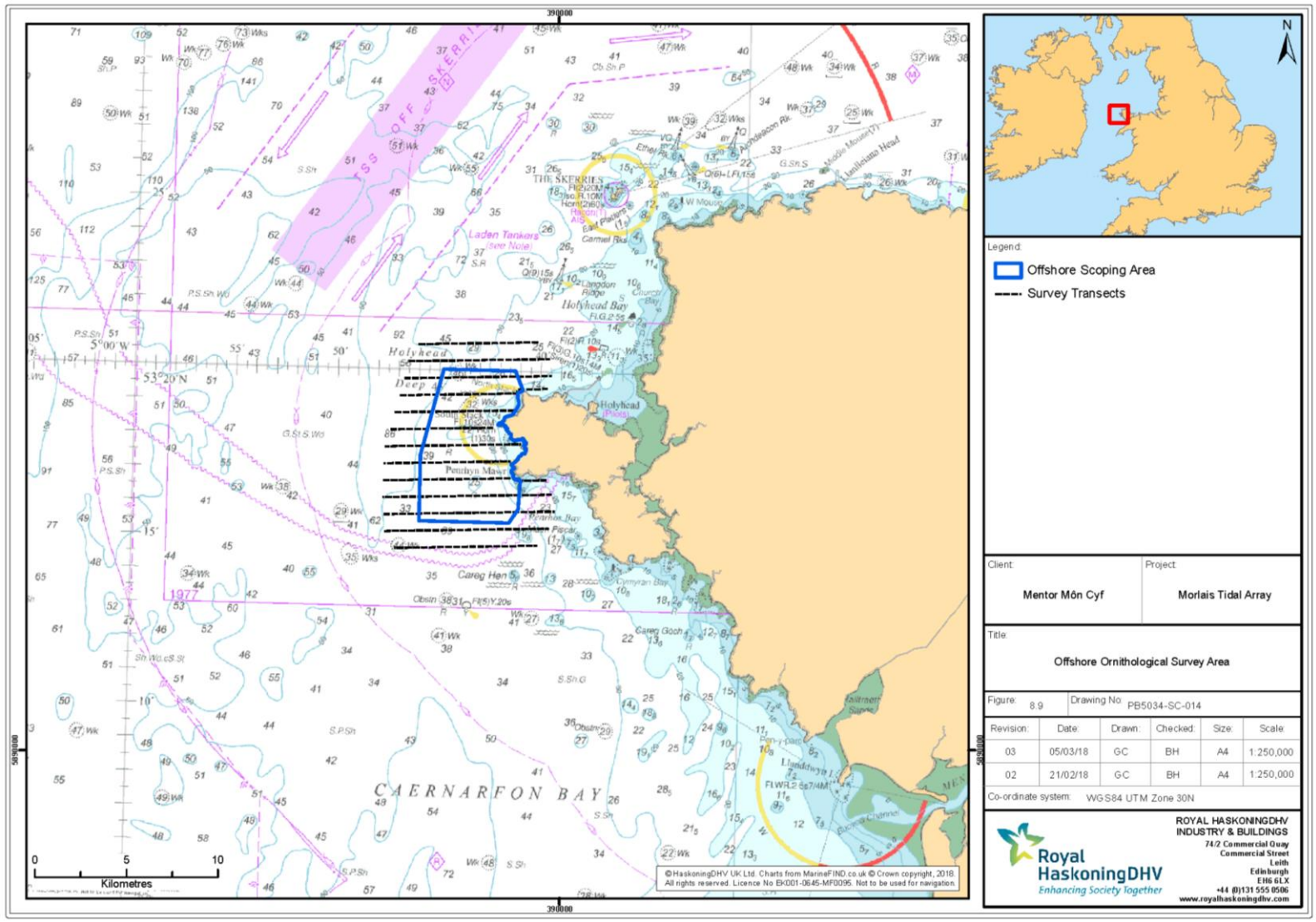


Figure 8-9 Offshore ornithological survey area

Results to date indicate guillemot to be the most frequently recorded species in the area for all but one survey undertaken, when kittiwake was recorded in higher numbers during the November 2017 survey. Black-headed gull was recorded in comparatively high numbers in the November and December 2016 surveys and manx shearwater numbers increased considerably in July 2017 as the second most frequently recorded species after guillemot, although with few sightings of the species on the water. Table 8-8 summaries the species recorded from monitoring surveys to date.

Table 8-8 Results from monitoring surveys to date (November 2016 – December 2017)

Species	Nov 16	Dec 16	Jan 17	Mar 17	Apr 17	(early) May 17	(late) May 17	Jul 17	Aug 17	Sep 17	Nov 17	Dec 17	Total
Common Scoter	-	2	4	-	-	-	-	-	1	3	21	1	32
Red-throated diver	3	1	-	2	3	1	-	-	-	-	-	-	10
Diver species	3	-	-	-	-	-	-	-	-				3
Shag	-	-	3	3	-	4	2	9	4		1		26
Fulmar	-	-	2	-	6	6	-	1	1			3	19
Manx-shearwater	-	-	-	-	2	16	119	399	19	1	1		557
Gannet	1	2	-	6	8	10	5	24	15	7	6	1	85
Razorbill	33	21	3	38	34	25	48	8	90	8	33	18	359
Guillemot	61	59	257	285	227	173	335	449	117	34	53	90	2140
Guillemot / Razorbill	22	23	8	76	21	9	16	4	22	22	32	13	268
Puffin	-	1	-	1	-	-	14	5	-	-	-	-	21
Kittiwake	1	2	10	6	3	18	33	4	25	5	90	3	200
Black headed gull	73	86	4	-	-	-	-	10	1	17	2	-	193
Mediterranean gull	-	1	-	-	-	-	-	-	-				1

Species	Nov 16	Dec 16	Jan 17	Mar 17	Apr 17	(early) May 17	(late) May 17	Jul 17	Aug 17	Sep 17	Nov 17	Dec 17	Total
Common gull	49	13	1	6	1	-	-	-	-	1	9	11	91
Herring gull	10	32	65	35	20	22	7	126	6	-	35	15	373
Great black backed gull	4	6	3	1	-	2	-	1	1	6	3	3	30
Lesser black backed gull							2	26	1		3	1	33
Small gull species	1	-	-	-	-	3							4
Large gull species	3	1	-	38	4	-	-	2	2				50
Gull species	3	-	-	-	-								3
Sand Martin	-	-	-	1	-								1
Pied wagtail				-	1								1
Whimbrel						2							2
Dunlin						4							4
Swallow						15							15
House Martin						1							1

Species	Nov 16	Dec 16	Jan 17	Mar 17	Apr 17	(early) May 17	(late) May 17	Jul 17	Aug 17	Sep 17	Nov 17	Dec 17	Total
Auk species						-	1	-	-				1
Arctic tern						-	65	3	-				68
Artic tern / common tern						-	10	1	--				11
Meadow pipet / tree pipit					-	-	-	2	5				7
Redwing												2	2
Total	267	250	360	498	330	311	657	1074	310	104	289	161	

8.5.2 Potential Impacts

Table 8-9 Potential impacts on ornithology

Potential Impact	Phase	Anticipated Significance	Comment
Onshore habitat loss	All	Potential impact significance unknown	The area for the onshore cable route and substation is likely to be largely developed although areas of open ground and scrub are present. These areas are unlikely to represent important habitat for birds. Landfall, cable route and substation may represent moderately important habitat for breeding and foraging birds. Grid connection cable routes from these locations are anticipated to be within roads with minimal impact to surrounding habitat. Habitat loss due to the cable route installation would be expected to be minimal and largely temporary. The significance of the impact will depend on the final cable route and substation location and the importance of the onshore construction areas in terms of bird nesting and foraging.
Disturbance due to onshore construction works	All	Potential impact significance unknown	Noise and presence during onshore construction works has the potential to cause disturbance. As the majority of the onshore area is expected to be developed, disturbance to birds is anticipated to be minor although there is the potential for disturbance to birds in open land around the landfall.
Collision risk from turbine and subsea infrastructure	Operation	Potential impact significance unknown	Further information is required to ascertain the risk of collision with turbines and subsea infrastructure. The risk is only expected to be associated with diving seabirds. The significance of impact is dependent on how birds behave around subsea structures and the importance of the offshore scoping area as a foraging ground.
Displacement from vicinity of turbine	Construction and Operation	Potential impact significance unknown	During construction there is a potential for noisy construction activities such as

Potential Impact	Phase	Anticipated Significance	Comment
			piling to displace birds from the vicinity of activity. There is a lack of understanding on whether operational devices cause displacement. In general, displacement during either the construction or operational phase is expected to be minor and localised.
Disturbance by vessel activity	Construction and Operation	Potential impact significance unknown	Vessel activity may result in localised displacement. Vessel activity during construction is expected to be more intense than the operational phase. Initial prediction of species within the offshore scoping area would suggest that these species are relatively tolerant of vessel activity and any displacement would be likely to be temporary and localised. The significance of the effect will depend on the importance of the offshore scoping area as a foraging ground and the sensitivity of the species which frequently use the site.
Lighting of offshore vessels, TECs and other infrastructure	All	Potential impact significance unknown	Lighting of offshore vessels during construction and the operational lighting of TECs and other infrastructure may impact on baseline distribution of the birds, as the coastal area is currently undeveloped and birds in the offshore scoping area may be sensitive to changes in the level of lighting. Further information regarding navigational lighting requirements and sensitivity of species present to lighting is required.
Marine seabed habitat loss/change due to installation of infrastructure	All	Potential impact significance unknown	The footprint of the TECs, substations and cables will remove some available habitat; however, the sensitivity of the impact will depend on the proportion of available habitat replaced and the importance of the offshore scoping area as a foraging ground. Given the current level of knowledge of

Potential Impact	Phase	Anticipated Significance	Comment
			available habitat, it is unlikely that the presence of devices will remove a significant proportion of key foraging habitat.

8.5.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Determining the seasonal distribution and abundance of species within the MTA area. It is likely that this would be done through a combination of:
  - A review of existing relevant bird data such as RSPB reserve data /British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) data/Joint Nature Conservation Committee (JNCC) Seabird Colony Counts;
  - Coastal and terrestrial bird surveys; and
  - Boat based/aerial surveys (see below).
- Completion and assessment of two years of site specific offshore ornithological surveys (November 2016 – November 2018).
- Gaining a greater understanding of species behaviours within the MTA area and potential connectivity to designated sites. It is likely that this would be done through a review of existing information and boat based/coastal surveys designed to look at behaviour such as flight direction and foraging behaviour during breeding season.

8.6 Terrestrial and Coastal Ecology

This section focuses on terrestrial ecology within the onshore scoping area. Ornithology receptors are discussed separately in Section 8.5**Error! Reference source not found.**, Geology, Hydrology, Soils and Flood Risk in Section 7.3 and Designated Habitats in Section 8.1.

8.6.1 Baseline

8.6.1.1 Terrestrial Ecology

The land within the onshore scoping area is a mix of:

- Urban development;
- Open/wild land;
- Coastal cliff (South Stack); and
- Pastoral agricultural land.

Due to the nature of onshore construction, impacts to terrestrial ecology are likely to be restricted to loss of habitat and behavioural disturbance. As Holy Island is isolated from the mainland, it is considered that impacts to ecology receptors from outside of Holy Island are unlikely (with the exception of ornithological receptors; Section 8.5). As such, this scoping report focuses on the ecology on Holy Island itself.

The central areas of Holy Island are largely rural pastoral land and coastal grassland, with upland areas of heath around Holyhead Mountain. These areas would be expected to be of low to moderate importance to terrestrial ecology receptors (excluding ornithology; Section 8.5).

Anglesey in general has a good diversity of species with several EPS being recorded, most notably:

- Red squirrel;
- Badger;
- Otter;
- Bat;
- Water vole;
- Great crested newt; and
- Polecat.

As a whole, the onshore scoping area is expected to be of limited ecological importance to these species, being mainly either agricultural or semi-urban in nature, although there are areas where these species could be present. Impacts to EPS species and species protected under the Wildlife and Countryside Act (1981) will be fully considered within the EIA.

The onshore scoping area contains limited natural habitat suitable for bat roosting, although agricultural and disused buildings may provide suitable roosting habitat for bats. Badger may be present in the onshore scoping area, particularly in the more rural areas.

It is assumed that, given the nature of the development and location the nature of any disturbance or habitat loss would be localised, a full review of impacts on terrestrial designated habitats suggested by NRW will be undertaken for the EIA and HRA, however, for this scoping survey, only designated sites on Holy Island have been considered in terms of terrestrial ecology.

The scoping area partially overlaps with the Holy Island SAC and SSSI, which is designated for coastal cliff and associated grass land and heath. Due to the nature of the onshore works, physical disturbance is expected to be localised and limited to the footprint of the development. Noise impacts during the construction and operational phases will be considered within the EIA. The impact on coastal SACs and SSSIs in terms of changes to sediment processes and receptor food resource will be assessed in the EIA and specific impacts on SAC and SSSI interest features will be addressed separately.

Proposed landfall and substation locations are mainly situated in grazed agricultural land of limited ecological importance; however, several species of note are recorded in the area that will be considered during the EIA. These include:

- Adder;
- Common Lizard;
- Silver studded blue butterfly;
- Large skipper;
- Small pearl-bordered fritillary;
- Shark moth;
- White ermine moth;
- Gold spot moth;
- Stoat; and
- Weasel.

There are also several plant species and habitats of note including:

- Thrift;
- Kidney vetch;
- Spring squill;
- Greater stitchwort;
- Lousewort; and
- Sea campion.

In addition, several rare species are present in the coastal heath, and of particular importance is the spotted rock-rose and the globally unique spathulate fleawort which is only found on Holy Island[61].

It is proposed than onshore cable route and grid connection cable routes follow existing road as far as possible; however, there will also be a need for short sections of cable route to cross unmade ground. The EIA will consider sensitive flora and fauna in further detail once preferred infrastructure options have been refined.

8.6.1.2 Coastal Ecology

Important coastal cliff and associated grass land and heath are present within the wider scoping area, such as those of the Holy Island Coast SSSI.

[61] *Visit Anglesey http://www.visitanglesey.co.uk/en/things-to-do/activities/wildlife-south-stack/# (accessed January 2018)*

The impact on coastal SACs and SSSIs in terms of changes to sediment processes and receptor food resource would be assessed in the EIA and specific impacts on SAC and SSSI interest features would be addressed separately.

The central areas of Holy Island, to the south and west are largely rural pastoral land and coastal grassland, with upland areas of heath around Holyhead Mountain. These areas would be expected to be of low-moderate importance to terrestrial ecology receptors (excluding ornithology; Section 8.5).

Table 8-10 Potential impacts on terrestrial ecology

Potential Impact	Phase	Anticipated Significance	Comment
Physical disturbance to terrestrial and coastal habitats during the cable installation	Construction and Decommissioning	Potential impact significance unknown	There is the potential for ecologically significant habitats and species to be present within the onshore construction area. The significance of the impact would depend on the final cable route. Beyond the land fall area onshore construction works are expected to be in largely previously developed or degraded land that is of little ecological importance although, connectivity with other sites would need to be considered.
Physical disturbance to terrestrial habitats during the construction of the substation	Construction	Potential impact significance unknown	It is anticipated that the significance will be low as the substation is likely to be constructed in an area of low importance to ecological receptors. However, the scoping area does include or is adjacent to some areas of important terrestrial habitat.
Disturbance to fauna during construction works	Construction and Decommissioning	Potential impact significance unknown	There is the potential for noise and visual impacts associated with installation works to cause disturbance to localised fauna during installation works.
Habitat loss	All	Potential impact significance unknown	The significance would depend on the final location of the substation and cable route and the overall footprint of the onshore development. It is anticipated that construction of the substation location will result in permanent habitat loss.

8.6.2 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- A greater level detail on terrestrial and coastal habitats would need to be gathered through a combination site specific survey and review of available data, including Cofnod local environmental records centre data.
- Information on the presence of UK and local priority species and EPS species would be needed. This would be likely to require a combination of literature review and bat, badger, red squirrel, water vole and phase one habitat surveys.
- Several priority aquatic species are likely to be present within the onshore scoping area. Freshwater habitat survey may be required to identify ecological receptors in need of consideration.

9 Human Environment

9.1 Seascape and Landscape

9.1.1 Baseline

The west coast of Anglesey has an uninterrupted view of open sea, with a scenic coastal area consisting of hard rocky cliffs and headlands interspersed with bays and insets, with headlands providing views to undeveloped areas of sea. The Holy Island coast is included within the Isle of Anglesey AONB. Some of the main features of the Isle of Anglesey AONB are low cliffs with coves and pebble beaches, sheer limestone cliffs, sandy beaches and stretches of sand dunes. The Isle of Anglesey AONB was designated to protect the aesthetic appeal and variety of the island's coastal landscape and habitats. The Holyhead Mountain Heritage Coast (HMHC) is also within the onshore scoping area, with some of the landfall options being within the HMHC boundary.

Key elements of the onshore infrastructure that have the potential to impact on landscape that will be considered during the EIA are:

- Landfall location. During installation, there will be either an HDD drilling rig or plant for cut trenching present;
- Temporary works for the installation of the onshore cable route and grid connection cable route;
- Temporary or permanent construction of access roads, haulage roads or emergency access areas;
- Temporary works for the construction of the substation location; and
- The presence of the substation.

The EIA will also consider the installation and operational presence of offshore infrastructure on land based receptors as part of the seascape assessment.

Whilst the final substation location is yet to be determined, Menter Môn is committed to a sympathetic substation design which will minimise visual impacts at the final location. This includes, where possible, placing the substation in an area where it will be less prominent and considering low impact designs. Consideration will be given to the appearance of the substation to ensure that it is as appropriate as possible to the surroundings.

A full seascape and landscape assessment will be undertaken as part of the EIA. The assessment will consider temporary and permanent impacts on the SCAs and LCAs defined below during construction, operation and decommissioning phases of the Project.

9.1.1.1 Seascape

A seascape assessment undertaken for the Isle of Anglesey Council in 2013 identified 36 Seascape Character Areas (SCA), five of which are relevant to the scoping areas[62]. These are detailed in Table 9-1 and their location is shown in Plate 9-1.

Table 9-1 SCAs identified as part of Anglesey Seascape Assessment

SCA	Description
Inland Sea (SCA 12)	The Inland Sea is a unique visual environment, created by the impounding of a tidal channel. The Stanley embankment across the channel accommodates the A55 duel carriageway and railway line. The Inland Sea has a rare variety of intertidal

[62] *IoACC (2013) Seascape Character Assessment.*

SCA	Description
	habitats and is a popular location for water sports. The character changes at Four Mile Bridge with the northern part of the sea remaining flooded at low tide and having a very shallow tidal range. The southern part drains at low tide into a few meandering channels, extensive sand banks, rock islets and sheltered muddy creeks. The surrounding landscape is low-lying and has a sense of seclusion.
Holyhead Mountain (SCA 13)	Holyhead mountain forms a high profile over Holy Island and is a prominent and distinctive landmark from both land and sea. The cliffs associated with the coastal area of the SCA are high and rugged and create a dramatic coastline. The lighthouse at South Stack is a prominent maritime feature that is still in use. The mountain itself is the largest expanse of coastal heath on Anglesey and consists of heather, bracken, gorse and grassland as well as the unique *spatulate fleawort*, The SCA supports a variety of seabirds and has a tranquil and remote feel despite the close proximity to Holyhead. It is also a site that is popular with visitors due to the panoramic view of the area.
Rhoscolyn (SCA 14)	This is a relatively flat, low lying area with horizontal horizons and uninterrupted views out to sea. The SCA is a mix of Rhôs (rush) pasture, coastal heath and exposed rock. The coast is deeply crenelated and consists of low rocky cliffs and small bays. It is an exposed coastline with active coastal waves. Holyhead mountain provides a prominent back drop to the northwest. There are small settlements following the coast along the B4545, however, away from this road settlements are scattered and mainly individual farms giving the SCA an undeveloped feel.
North West of Anglesey (offshore (SCA 30))	This is a deep-water environment with an undulating rocky sea floor and high energy due to tidal currents flowing parallel to the coast. The Holyhead to Dublin ferry passes through the southern part of the SCA. There are many wrecks within the SCA and low levels of fishing which is predominantly longlining or whelk potting. The lights and breakwaters of Holyhead Harbour are visible to the south-east. Holyhead mountain is also a prominent landmark.
West of Anglesey (offshore (SCA31))	In the eastern part of the SCA the seabed is a rocky, moderate energy environment. Further offshore the seabed deepens and becomes dominated by sediment with patches of rock. The coastline of this SCA (SCA14) is treacherous and contains many offshore rocks and wrecks. The South Stack is located just to east of the SCA boundary in SCA 13.

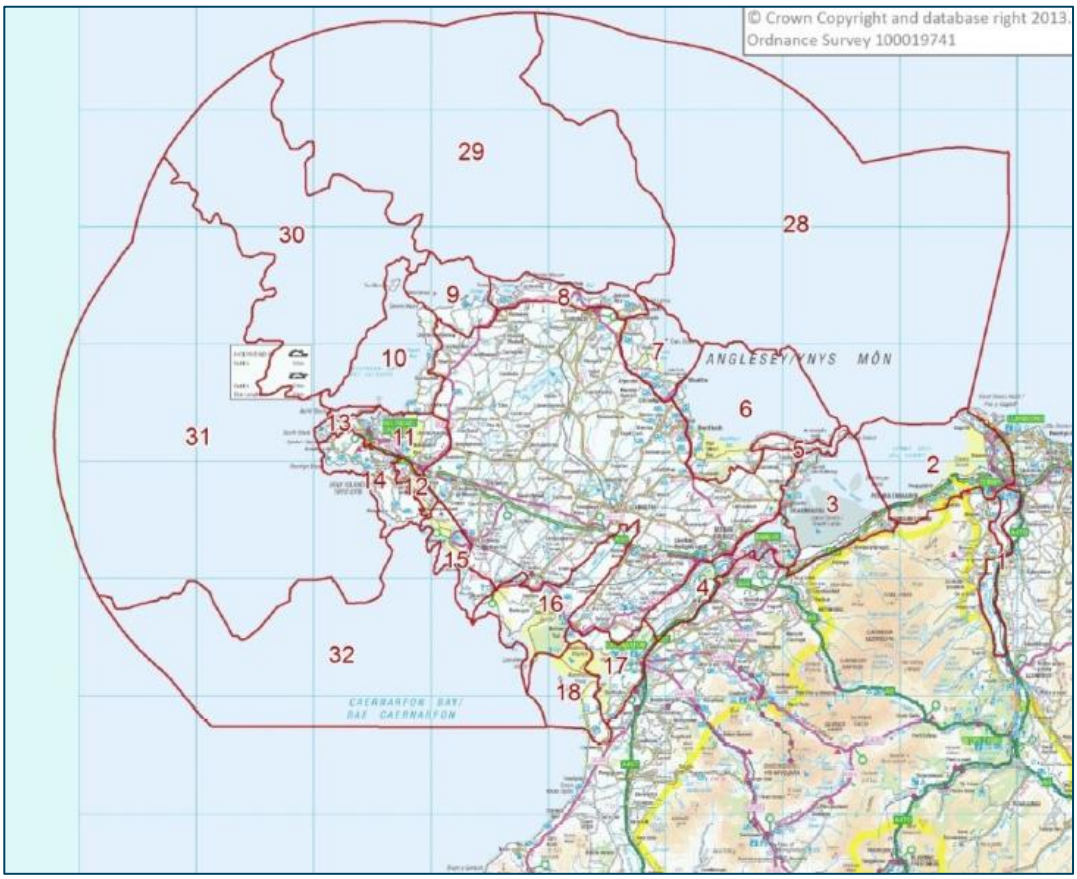


Plate 9-1 Seascape Character Areas

Potential substation locations were investigated during an initial onshore site feasibility review. A further substation options appraisal then assessed four preferred potential substation sites located with SCA 14. The aim of the options appraisal was to identify, predict and evaluate potential sensitives of landscape visual receptors to the proposed development.

The sites are located around Penrhos Feilw, where the preferred offshore cable landfall route is located. The sites are all within approximately 1 km of the bay. These proposed substation sites would potentially be visible from SCA 11 and SCA 13, depending on the location, although a temporary drilling rig is expected to be the only disturbance visible from sea and adjacent headlands. The substation locations are further in land and would be unlikely to be visible due to the elevation of the cliffs.

Potential grid connection cable routes options are within SCA 11 and SCA 14 but would require only temporary installation works.

The final location and form of the substation will be sympathetically designed to reduce impacts on landscape as far as possible. Landfall installation will require a HDD drilling rig and working area to be used during cable installation operations. Due to the nature of the landfall locations this is likely to be in a prominent position but would be temporary. Once landfall installation has been completed, there would be no permanent structures present.

The majority of cable route options within SCA 14 have been proposed within existing roads, once cable installation works have been completed it is not expected that there will be permanent works visible that would affect the character of the SCAs.

The grid connection points at Parc Cybi and Orthios Holyhead Eco Park are on the boundary of SCA14 and SCA11, and within a largely urban environment. The grid connection option at Valley is within the northern most area of SCA 15. There would be some temporary visual impacts during the installation of the cable, although as the surrounding area is largely urban or semi-urban, visual impacts are anticipated to be reduced. There are not anticipated to be any permeant visual impacts once the cable route has been installed. Substation installation at the grid connection point at Valley would be within open ground, adjacent to Valley. There are likely to be some visual impacts within SCA15 which will need to be considered at EIA if this option is progressed.

The offshore development would largely be within SCA 31 and border SCA 14. Construction activity and surface piercing infrastructure would be visible from receptors in areas of offshore SCAs 30, 31 and 32. Offshore construction and operational activities would also be visible from onshore SCAs 13 and 14. The offshore cable route would pass along the boundary of SCN13, 31 and 10 and would approach the landfall through SCA 11. There would be little visible indication of the cable route during operation, particularly from distance, however, construction activities would be visible from offshore SCAs 30 and 31 and onshore SCAs 10, 11 and 13.

Within the scoping area and adjacent area there are several heritage coasts, the Holyhead Mountain Heritage Coast, the North Anglesey Heritage Coast and the Aberffraw Bay Heritage Coast. The offshore Project would be likely to be visible from the Holyhead Mountain Heritage Coast but is unlikely to be viewable from the other two heritage coasts. Construction activity within the cable route and increased vessel activity within the harbour are likely to be visible from the North Anglesey and Holyhead Mountain Heritage Coasts.

9.1.1.2 Landscape

The Isle of Anglesey Council undertook a review of Landscape Character Areas (LCAs) in 2011. The document divides the study area into two. Site 1 falls into the Holyhead Mountain landscape unit which is evaluated as being of outstanding quality, and Sites 2 to 4 fall into the Holy Island landscape unit, which are evaluated as being of high quality. The landscape unit descriptions are included below:

Holyhead Mountain

Holyhead Mountain forms the highest point on Anglesey, rising up to 220 metres AOD. It has a distinctive rounded profile which reflects the underlying geology of metamorphic Cambrian ag rocks and includes the well known South and North Stacks on its rocky northern coastline. The resultant landscape is one of open rocky moorland with immense natural history and historic/cultural interest. It includes Holyhead Mountain Conservation Area and the Breakwater Country Park, the site of a disused quarry, and the settlement pattern reflects this quarrying past. An isolated, wild non- tame landscape with distinctive land use and fine views. Its historic and cultural values are also important. There is evidence of settlement from prehistoric times, through to the wider encroachment of common land and quarrying. Culturally it forms an iconic feature, especially to the many immigrants from Ireland, where it was the first sight of the UK. The importance of the LCA is reflected by the range of statutory designations: SSSI, SAC, SPA, SAM, RIGS that are found.

Holy Island

The LCA forms the majority of Holy Island and contains the main settlement of the island, Holyhead. It is a physically distinct unit separated from the main island but linked by a causeway (Stanley Embankment) and the Four Mile Bridge. It falls into two distinctive sub units, separated by the development corridor of Holyhead-Trearddur along the B4545 road. To the north of this, the landscape is relatively low lying but due to the underlying geology has a number of craggy outcrops. The area has small fields typically with stone boundaries and gorse hedges. The fir trees that grow here exhibit a windblown form. To the south of the road, again there are rough, craggy areas. However, around Rhoscolyn is an area of more undulating terrain, where glacial clay cover is more widespread, with discrete rocky outcrops and areas of coastal and estuarine alluvium. At Penrhos is the former estate of the Stanley family which is now managed as a

Country Park. There are a number of important habitats - dry heaths, coastal and intertidal - often within a larger matrix of improved grassland. However, many of these 'islands' of habitat value are designated as SSSIs and the LCA represents a landscape character that is quite distinctive – rural, wild, exposed, coastal – with the main detractor being aircraft noise from the adjacent RAF Valley airfield.

9.1.2 Potential Impacts

Table 9-2 Potential impacts on seascape/landscape

Potential Impact	Phase	Anticipated Significance	Comment
Changes to landscape	Construction and Decommissioning	Potential significance of impact unknown	Depending on the location of the landfall and substation there is the potential for temporary visual disturbance to onshore receptors. Impact on visual receptors will depend on the chosen location of the landfall and substation.
Changes to the landscape through the presence of onshore infrastructure	Construction and Operation	Potential significance of impact unknown	There are currently several options for the landfall and substation locations, including in made and unmade ground. The potential impact will depend on the final chosen location. The location of the substation is likely to be in an area of existing development within the Holyhead SCA and is therefore unlikely to have a significant impact on the nature or the SCA. However, the significance will be dependent on the final location and design of the substation.
Changes to seascape character from offshore infrastructure	Construction and Operation	Potential significance of impact unknown	The introduction of permanent manmade structures to the offshore environment may result in significant changes from baseline conditions. However, the significance will be dependent on the final project design, in particular, the nature and amount of surface piercing devices and increased vessels activity.
Changes to visual amenity	All	Potential significance of impact unknown	The construction and introduction of manmade structures into previously undeveloped areas of sea has the potential to impact on the amenity of the offshore area. The significance of the impact will be dependent on the final project design.

9.1.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Establishing a preferred landfall, substation location and cable corridor location.
- Conducting a joint assessment of seascape and landscape visual impacts (including an assessment of impacts upon natural beauty).
- Continued desk and literature review of local SLVIA conditions, including NRW LANDMAP and relevant guidance notes, AONB Management Plan 2015-2020, Anglesey Landscape Strategy Update 2011, Seascape Character Area Assessment, Wales Coastal Path maps.
- Assessment of photographic survey.
- Development of mitigation measures, if required.

9.2 Land Use and Quality

This section outlines the baseline for land use and quality. As disturbance of land is a localised impact, this section focuses on the area of the landfall and substation location with a brief description of general settings.

Substation locations within the scoping area are in rural, agricultural ground. Site specific land quality assessment will be undertaken during the EIA once the final substation location is confirmed.

9.2.1 Land Use

Land use for the landfall and substation locations within the scoping area is expected to be in either rural pasture or scrubland, avoiding sensitive land of ecological importance. Landfall is expected to be via unmade rural pasture adjacent to seacliffs using HDD. The substation location search area has been identified predominantly within grazed pasture or low value scrubland.

Several cable route options between substation locations and the grid connection point are being considered. Grid connection cable routes would need to pass through the interior of Holy Island to connect to grid at the three grid connection options.

As far as possible, onshore cable routes and grid connection cable routes being considered have been routed within the existing road infrastructure, although small sections of cable route would need to be installed in unmade ground.

With the exception of Holyhead, Penrhos and Trearddur, the majority of Holy Island is rural and agricultural land with small settlements and individual dwellings.

9.2.2 Land Quality

The substation search area is a rural area, predominantly used for grazing or unmade scrubland. It would be anticipated that land quality in these areas would be relatively good with little or no risk of significant contamination.

With the exception of the former Anglesey Aluminium works, there is little or no evidence of historical uses that may have resulted in significant contamination, although this would need to be confirmed once final substation locations and cables route options are refined. Cable routes passing through Valley would need to be considered in detail once final routes have been determined. Given the industrial uses around the former Anglesey Aluminium works, cable routes passing close to these locations would need to be considered further in terms of land quality. If the cables are directed across former Anglesey Aluminium land to the Orthios site for grid connection, the potential for land contamination will be assessed within the ES.

9.2.3 Potential Impacts

Table 9-3 Potential impacts on land use and quality

Potential Impact	Phase	Anticipated Significance	Comment
Nuisance or obstruction to land use from construction activities	Construction	Potential impact significance unknown	Construction of the landfall, cable route and substation is not expected to be in areas of high residential activity; however, some local businesses may experience disruption. Disturbance to individual receptors would

Potential Impact	Phase	Anticipated Significance	Comment
			need to be considered once cable routes have been determined in greater detail.
Disturbance of contaminated land	Construction	Potential impact significance unknown	It is assumed that rural land used for construction of the cable route and substation would be uncontaminated; however, the final locations may use or cross brownfield land which would need to be assessed for possible contamination.
Loss of land by footprint of onshore substation	Operational	Potential impact significance unknown	As the final location and size of the substation is not yet identified it is not possible to determine the potential impact.

9.2.4 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- The distribution of land use activities to determine potential impacts to other users. It is anticipated that this will be done through a mapping and desk study.
- Once the infrastructure locations are determined, the potential for contaminated land will be determined. This will be done through desk study based on historical land use and geophysical works once final locations are determined.
- Distribution of utilities and services to identify potential conflicts along the cable and substation location. This will largely be done via a GIS mapping exercise of available data.
- A review of roads and dwellings, including Noise Sensitive Properties (NSPs), this information will also be relevant for the noise assessment within the EIA.

9.3 Commercial Fisheries

This section describes commercial fishing activity. Impacts on navigational safety are discussed in Section 9.4. The latest UK Sea Fisheries Statistics report has been used to inform this section[63].

9.3.1 Baseline

In 2016, there were 753 commercial fishermen recorded in Wales with Wales recording the lowest quantity of landings of all UK nations, at approximately 9,900 tones. Of this, 8,800 tonnes were shellfish and remainder was demersal fish.

In 2016, 39,600 Tonnes of landed fish (by UK fishing vessels) were reported as being sourced in the Irish Sea, which was the 5th largest catch figure for UK fishing areas. The Welsh fishing fleet has remained reasonably constant, with 451 vessels being recorded in 2016.

Holyhead is one of three commercial fishing ports in Wales which record landing statistics, with the other two being Milford Haven and Saundersfoot. The number of commercial vessels registered at Holyhead in January 2018[64] was 22 vessels below 10m and one vessels of greater than 10m (17.58m in length).

In the nearby area, small numbers of less than 10m vessels are registered at Holy Island, Bangor, Almwch, Beaumaris and Caernarfon. These are typically local shell fishing vessels, and with the exception of the vessels registered at Holy Island, the offshore scoping area is likely to be beyond their local fishing areas. The majority of the vessels registered at Holy Island are licenced shell fishing boats, however, they are not licenced scallop fishing vessels and they are likely to be mainly potting vessels targeting local crab and lobster. The Anglesey and surrounding area has long historic links with commercial fishing; however, the industry has been in decline over recent years. Figure 9-1 indicates that fishing activity does occur in the offshore scoping area; however, this is generally at a low level (less than 250 hours a year).

The MDZ is expected to contain relatively hard, rocky seabed and complex hydrodynamic systems. As such, it is assumed to be of a relatively low value as a fishing area, although this will need to be confirmed through consultation and a more detailed review during the EIA.

[63] *MMO (2016) UK Sea Fisheries Statistics. https://www.gov.uk/government/statistics/uk-sea-fisheries-annual-statistics-report-2016 (accessed January 2018)*

[64] *MMO (2018) https://www.gov.uk/government/collections/uk-vessel-lists (accessed January 2018)*

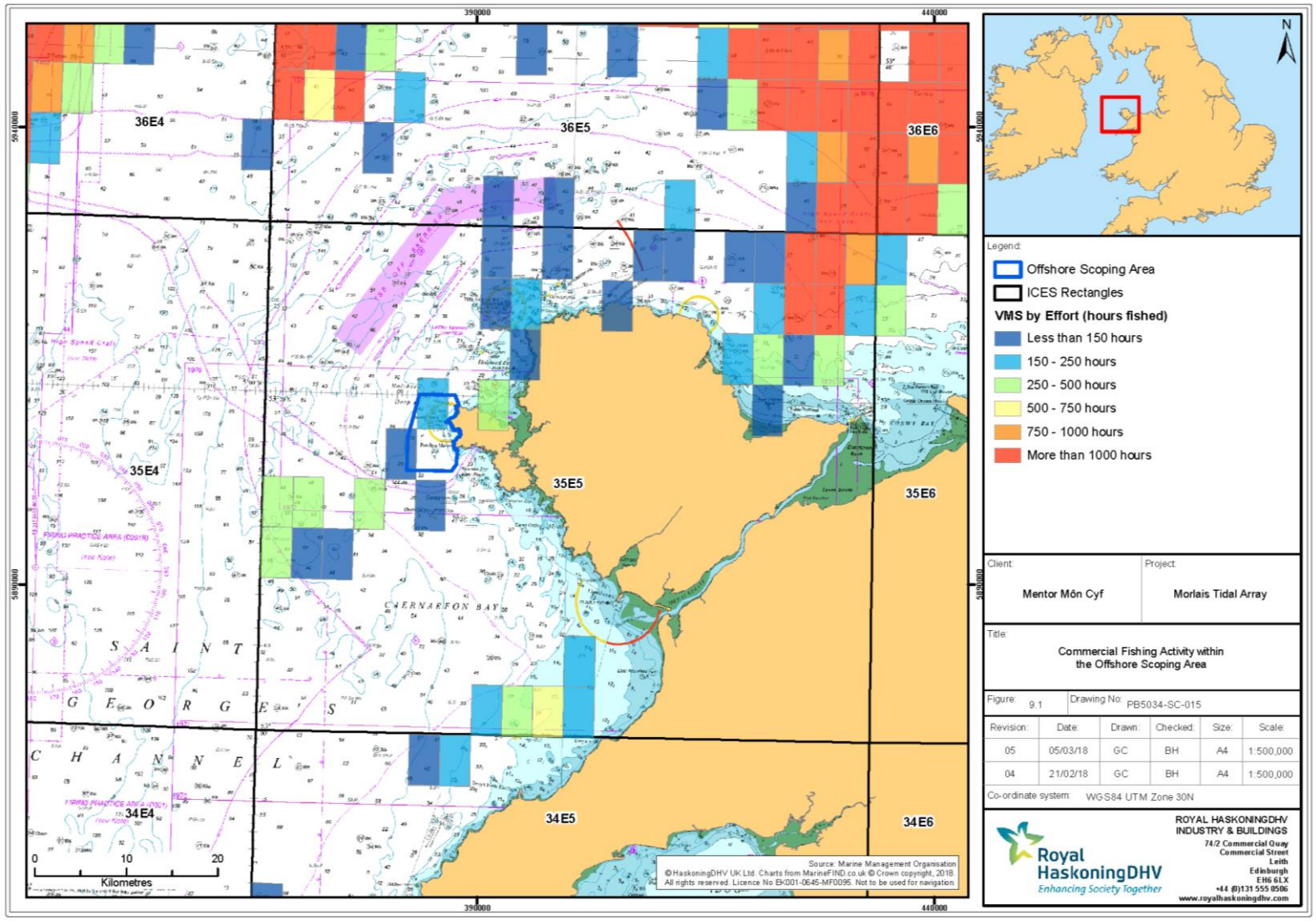


Figure 9-1 Commercial fishing activity within the offshore scoping area

9.3.2 Potential Impacts

Table 9-4 Potential impacts on commercial fisheries

Potential Impact	Phase	Anticipated Significance	Comment
Loss of access to fishing grounds resulting from presence of devices, restrictions and exclusion zones	All	Potential impact significance unknown	The potential loss of fishing ground due to the presence of the built project may result in loss of fishing resources and extended transits to alternative fishing area. The importance of the offshore scoping area to local fishermen is not fully understood and would need to be clarified during the EIA.
Obstruction to regular fishing vessel transit routes	All	Potential impact significance unknown	Larger fishing vessels from Holyhead may transit through the offshore scoping area to access fishing grounds in the wider Irish Sea area. Local, small boat fishing boats may also transit through the offshore scoping area and adjacent coastal area. Obstructions to routes may result in longer transiting times.
Change in abundance of target species	All	Potential impact significance unknown	The addition of new structures on the seabed may provide shelter and habitat for commercial target species.

9.3.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Establishing the types and level of fishing activity within the offshore scoping area, the cable route and adjacent area through consultation with local fisheries associations, local fishermen, NRW and the MMO.
- Identifying any areas that are important for fishing activity and determine how these areas are used within the footprint of any of the project components. This would be established through consultation with local fishing groups, representatives, stakeholders and the MMO.
- Establishing transiting routes that transverse the offshore scoping area or the cable route and the frequency of crossings. This would be established through discussions and consultation with local stakeholders, local fishermen and industry representatives.

9.4 Shipping, Navigation and Marine Infrastructure

This section outlines shipping and vessel navigation considerations within the offshore scoping area.

9.4.1 Baseline

9.4.1.1 Shipping

The Holyhead to Dublin ferry sails out of the Holyhead Harbour, although this does not enter the MDZ. There are six daily sailings and two additional ferries, one that departs at 08:55 Tuesday to Saturday and one that departs at 20:30, Tuesday to Friday.

Annually there are approximately 8,000 ferry movements and approximately 500 other large vessel calls (bulk carrier, cruise liners coasters or large fishing vessel). The harbour has a 2.4km long breakwater and offers two sheltered anchorage areas. There is a separate fish dock that services a fleet of small fishing vessels. The harbour is also used by recreational fishing vessels and small workboats[65].

Holyhead Harbour also contains a recreational marina and is a popular yachting location and mooring area.

9.4.1.2 Navigation

The cable corridor approaches the landfall along directly to the east of the MDZ and is within a UK racing and UK sailing area with a major shipping route approximately 5km to the north at its nearest point (Figure 9-2).

Vessels approaching Holyhead Harbour from the south are likely to cross the offshore scoping area and may cross the cable route as this would be the most efficient approach in terms of distance.

9.4.1.3 Marine Infrastructure

The offshore area around west of Anglesey is generally undeveloped with no major built infrastructure within the offshore scoping area or wider Irish Sea area. There are two subsea cables (as reported by Kingfisher[66]) that cross the offshore scoping area and make landfall on the west coast of Holy Island (Figure 9-3).

[65] *UK Ports and Harbour Information. www.ports.org.uk (accessed January 2018)*
[66] *Kingfisher subsea cable awareness http://www.kis-orca.eu/map#.WmooPNISHIU (accessed January 2018)*

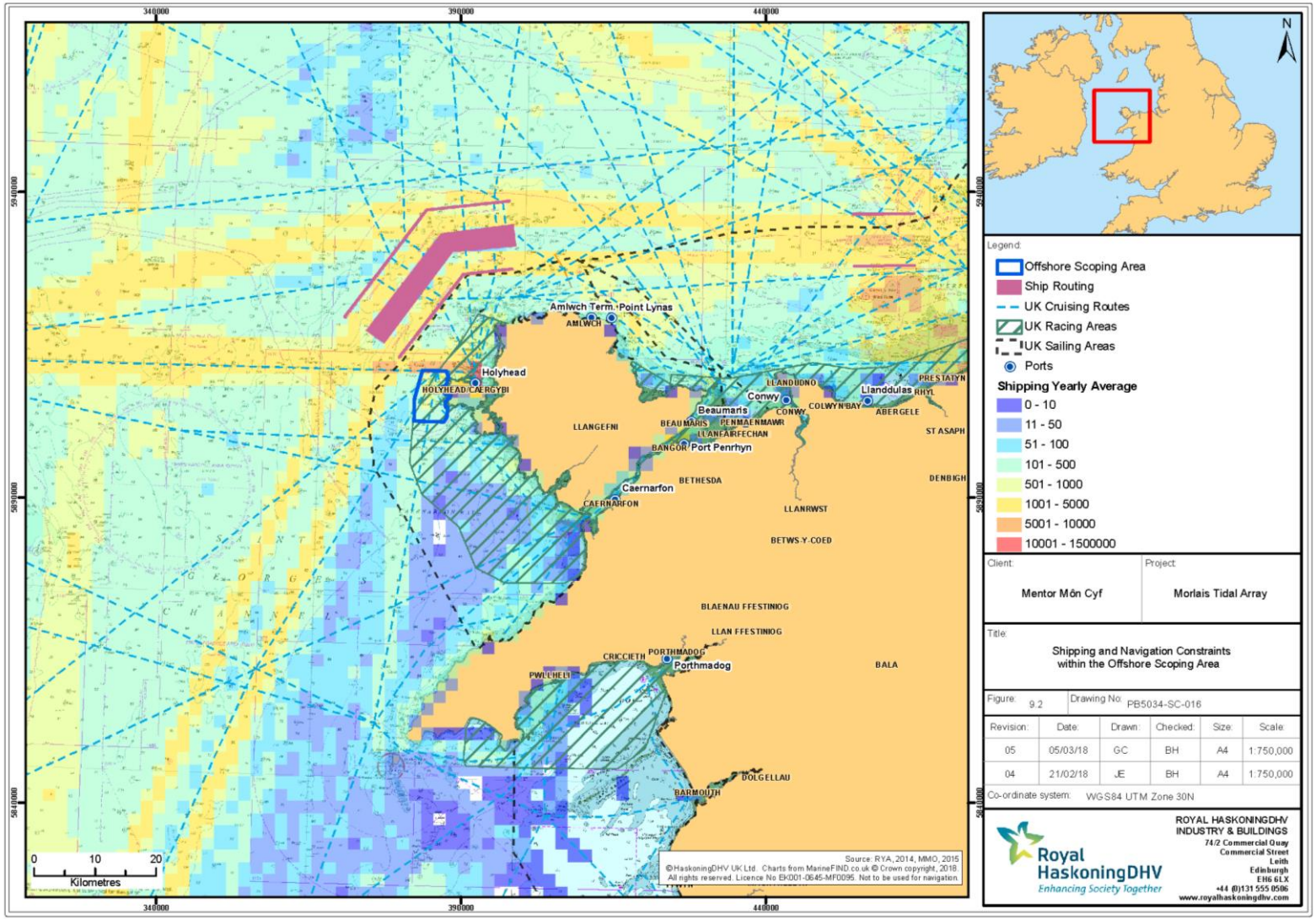


Figure 9-2 Shipping and navigation constraints within the offshore scoping area

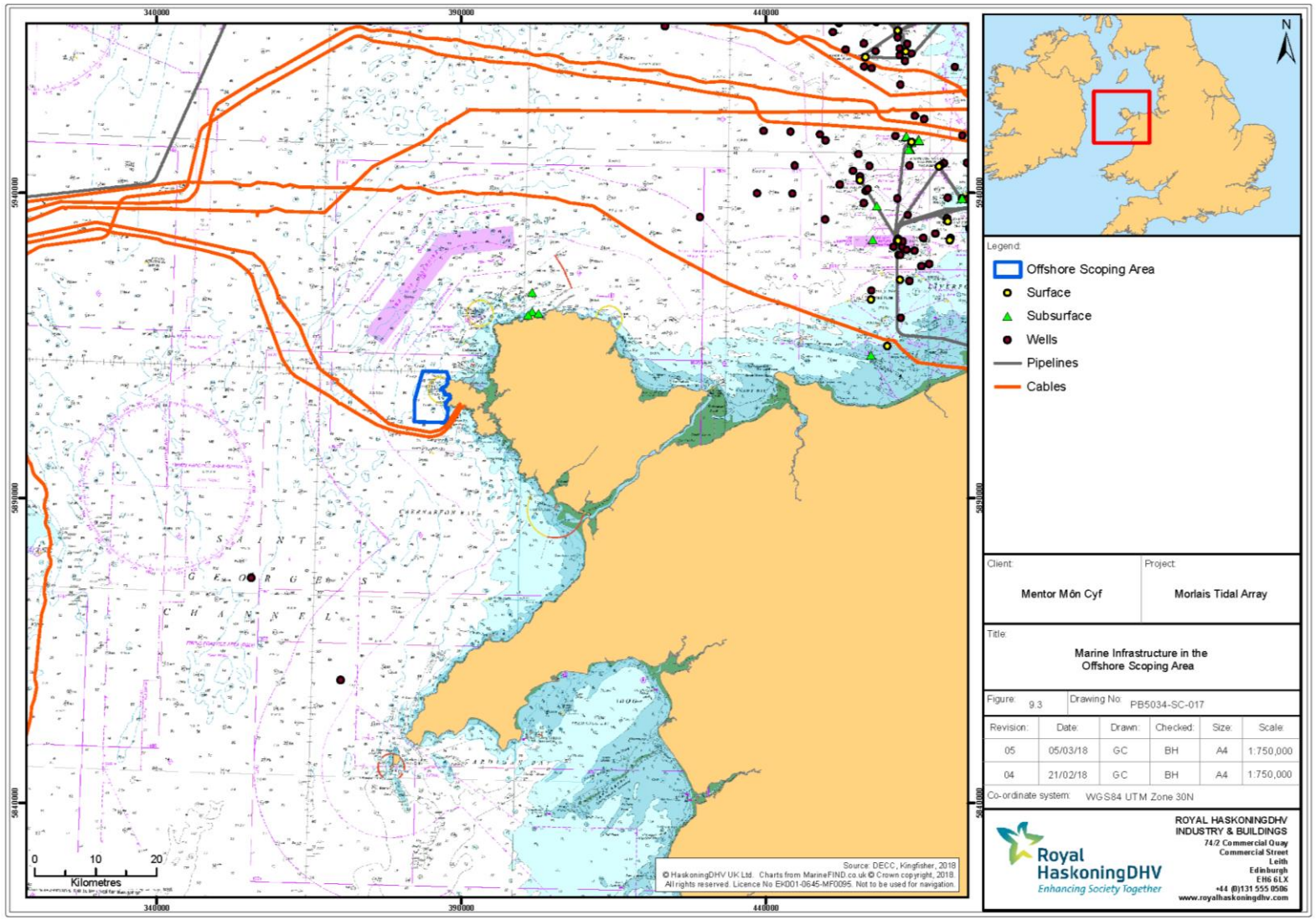


Figure 9-3 Marine infrastructure in the offshore scoping area

9.4.1.4 Marine Traffic

The marine traffic baseline has been established using 28 days of Automatic Identification System (AIS) and radar data collected by a survey vessel during March and April 2017 (winter survey) and August and September 2017 (summer survey). The survey was carried out from South Stack, a small island situated just west of Holy Island on the northwest coast of Anglesey.

The tracks recorded during the winter marine traffic survey are presented in Figure 9-4 and summer marine traffic surveys in Figure 9-5, which is colour coded by vessel type.

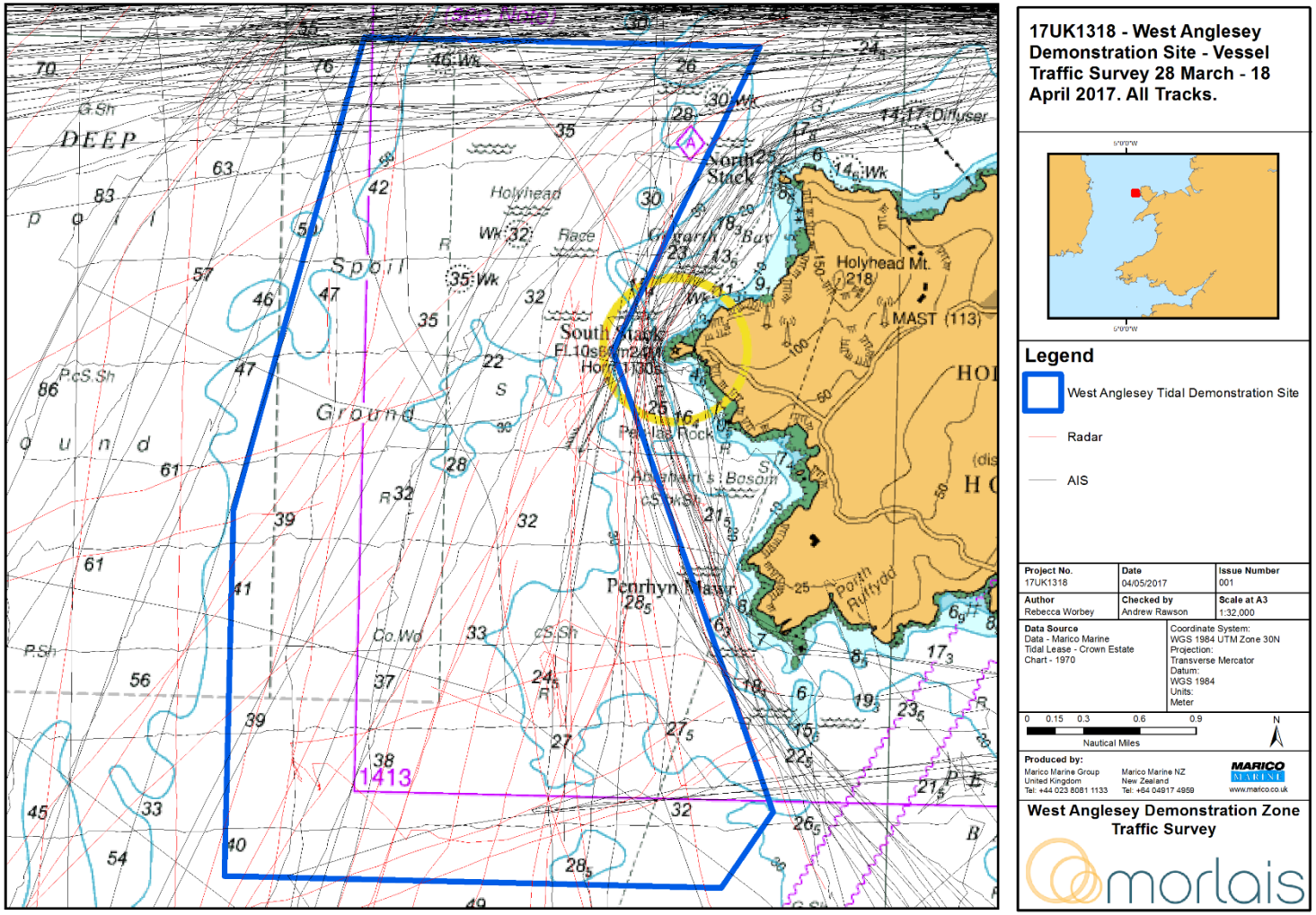


Figure 9-4 AIS and Radar Tracks during the winter marine traffic survey[67]

[67] *Marico Marine (2017). West Anglesey Demonstration Zone Traffic Survey Report*

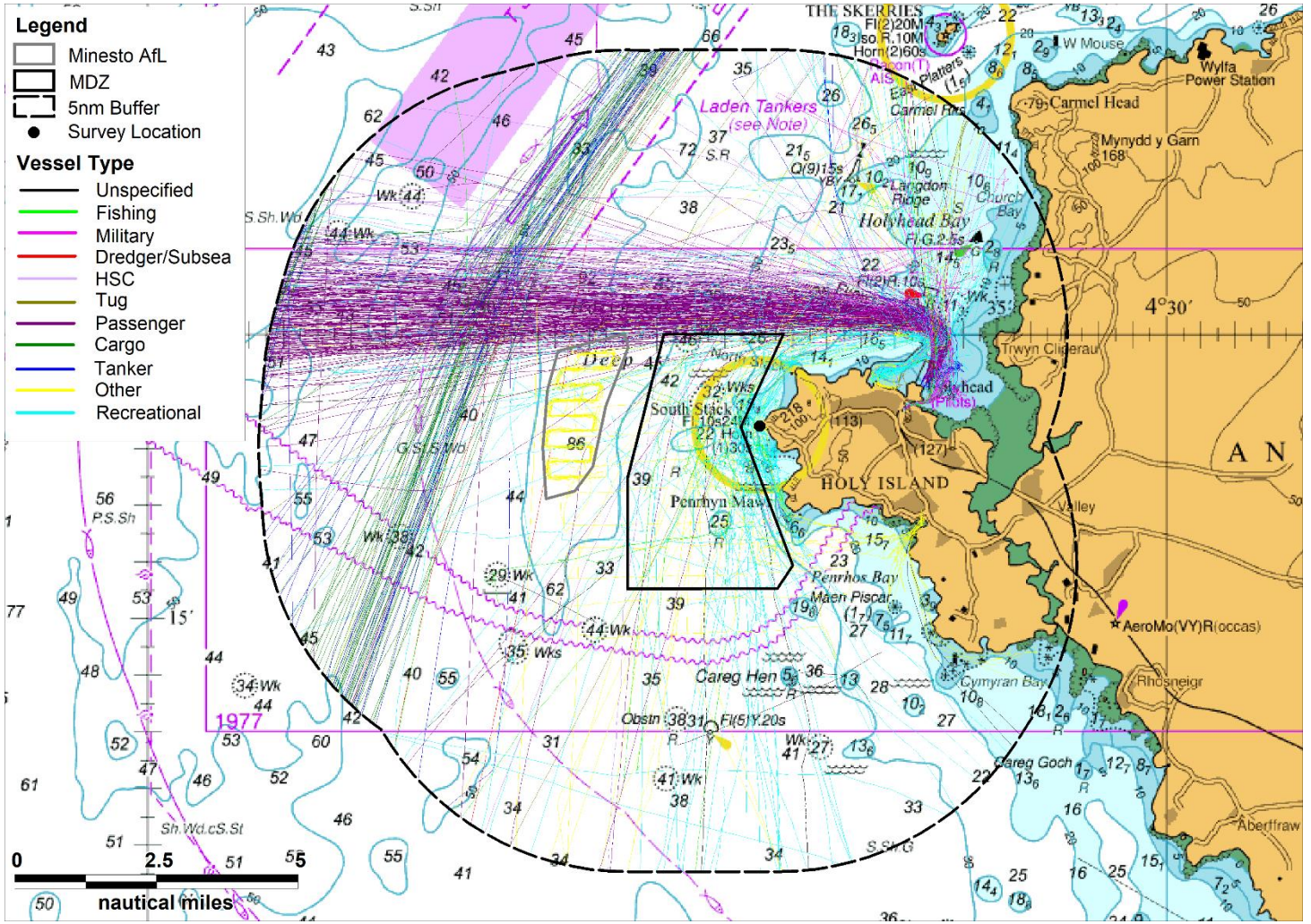


Figure 9-5 AIS Tracks coded by Vessel Type during the summer marine traffic survey[68]

[68] *Anatec (2017). Summer Maritime Traffic Survey, South Stack, Anglesey*

Within the study area during the winter marine traffic survey 24 vessels were recorded during the 14-day period. The most common type of vessel was passenger, followed by Royal National Lifeboat Institution (RNLI) Search and Rescue (SAR), recreational/pleasure crafts, offshore windfarm support vessels and fishing vessels.

During the summer marine traffic survey there was an average of 35 transits per day. The most common type of vessel passing through the study area was recreational (37%). The high proportion of recreational transits can be attributed to the summer time period and weather, including a Bank Holiday weekend (26th-28th August) when a high count of yachts and motor boats were noted. Other regular vessel types recorded within the area included cargo (13%), passenger (12%) and other (11%). The passenger vessels recorded were mainly ferries which made regular transits between Dublin and Holyhead (a high-speed craft also serves this route). A total of 52 unique cargo vessels made 65 transits through the study area during the survey period. The majority of these used the northbound lane of the Off Skerries Traffic Separation Scheme (TSS). The most common destinations for cargo vessels were Liverpool and Birkenhead. Vessel categorised as 'other' included RNLI lifeboats, survey vessels, pilot vessels and buoy laying vessels.

A total of 23 fishing vessels were recorded during the survey period, five on AIS and 18 on radar. Visual observations were also identified over the 15-day survey period. visual observations identified over the 14-day survey period, colour-coded by date recorded. These targets were not broadcasting on AIS and were not able to be reliably tracked on radar for at least part of their transit, mainly due to their small size. There were 76 unique targets visually identified over the survey period, 70 of which were recreational vessels. These included motorboats, yachts, sea anglers, kayaks and jet skis. Other vessels included fishing vessels, one police launch and one unspecified vessel.

During the summer survey period 100 unique vessels intersected the MDZ area. There were 41 vessels tracked on AIS and 59 Radar targets. The majority of vessels intersecting the MDZ were recreational vessels (62%), followed by passenger (14%), fishing (10%) and other (10%). The passenger vessels were mainly ferries crossing the northern part of the MDZ transiting between Holyhead and Dublin. In addition, 20 vessels were visually observed within the MDZ, this included 19 recreational vessels and one police launch.

As the Project will interfere with rights of navigation, Menter Môn intend to apply to the Welsh Government for a Transport and Works Act Order (Section 3.2.1).

9.4.2 Potential Impacts

Table 9-5 Potential impacts on shipping and navigation

Potential Impact	Phase	Anticipated Significance	Comment
Interaction of vessels with commercial, fishing and recreational vessels	All	Potential impact significance unknown	During the construction phase the presence of installation vessels undertaking construction activities within the offshore scoping area have the potential to interfere with other marine users entering and leaving the harbour. During the operational phase, work boats within the MDZ may impact on other marine users. The significance of impact will be dependent on whether Holyhead is used as the construction port, and if exclusion zones are applied.

Potential Impact	Phase	Anticipated Significance	Comment
			There is also the potential for extending transiting time for fishing vessels and vessels leaving/approaching the Harbour from the south.
Impacts on navigational safety	All	Potential impact significance unknown	The installation and operation of TECs will reduce the navigable water depth within MDZ. If cable armouring is required, this would reduce the navigable water depth within the cable corridor.
Increased collision risk with other marine users	All	Potential impact significance unknown	The presence of additional vessels operating in the offshore scoping area has the potential to increase collision risk. The significance of the impact will be influenced by whether working and construction vessels are operating out of Holyhead Harbour.

9.4.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Analysis of 28 days of marine survey traffic data in the study area.
- Analysis of existing AIS and vessel data collected previously in the study area will be undertaken, utilising existing data sets where available.
- Casualty information from the Marine Accident Investigation Branch (MAIB) and RNLI.
- Implications of the size and location of the site on SAR resources.
- A Navigational Risk Assessment (NRA) undertaken in accordance with Marine Guidance Note (MGN) 371 (and 372), the Maritime and Coastguard Agency (MCA) Methodology for Assessing the Marine Navigational Safety and Emergency Response Risks of Offshore Renewable Energy Installations, and the MCA's Under Keel Clearance Policy paper.

9.5 Military Activity

This section outlines the military activity within the onshore and offshore scoping area.

9.5.1 Baseline

Royal Air Force (RAF) Valley is the only Ministry of Defence (MoD) owned site on Anglesey and is located to the south east of the offshore scoping area, to the north of Rhosneigr. RAF Valley is a training base for advanced fast jets for RAF and Royal Navy Pilots. RAF Valley was also formerly the operational base for a number of Sea King helicopters which provided a search and rescue role for the Irish Sea, Snowdonia and the wider North Wales area.

The landfall, substation and cable route locations are within a low flying area which covers the whole of Anglesey and the surrounding area. Although the landfall and substation locations are not within the Military Aerodrome Traffic area, the grid connection cable routes are likely to be within this area (Figure 9-6).

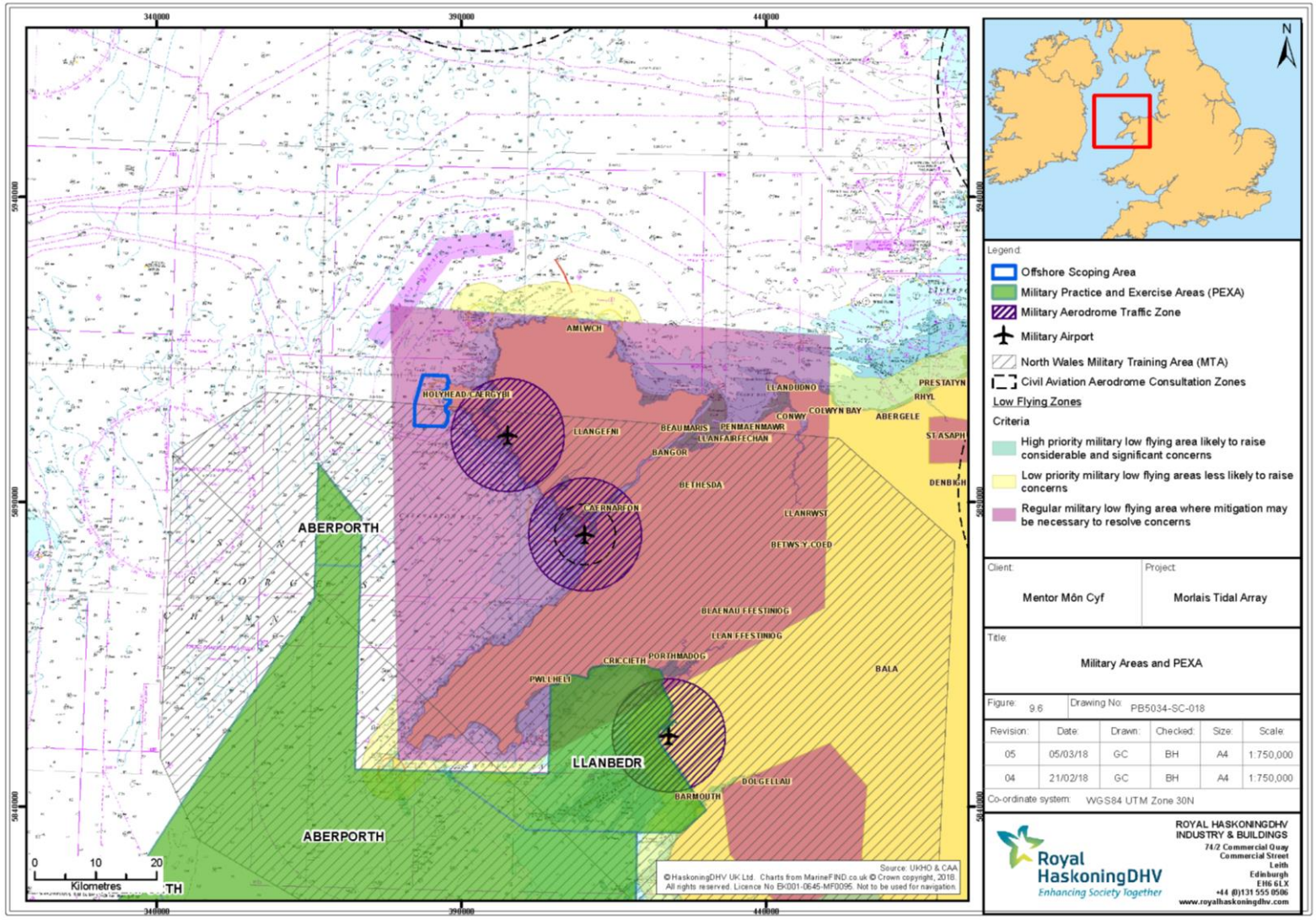


Figure 9-6 Military areas and PEXA

Except the MoD aviation receptors, there are no other military receptors that are known to be located within the scoping areas.

Figure 9-6 shows that the offshore scoping area is to the west of a Military Aerodrome Traffic Zone, with the potential for some overlap in the southeast corner of the offshore scoping area. The landfall and onshore infrastructure are within the traffic zone. The whole of Anglesey, the Llyn Peninsular and Snowdonia are covered by a regular military low flying area, where mitigation may be necessary to resolve concerns. These concerns and any appropriate mitigation would need to be discussed through consultation with the MoD and RAF Valley. There is also a military practice and exercise area that covers some of the offshore area to the south west of the offshore scoping area.

There are no known naval exercise or live firing areas within or adjacent to the offshore or onshore scoping areas.

9.5.2 Potential Impacts

Table 9-6 Potential impacts on military activity

Potential Impact	Phase	Anticipated Significance	Comment
Interference with RAF Valley radar facilities	All	Potential impact significance unknown	It is not anticipated that the presence of subsurface devices or surface piercing devices may influence RAF Valleys radar systems; however, potential interference would need to be discussed through consultation with the MoD and RAF Valley

9.5.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Identifying the likelihood of radar interference from surface piercing devices and substation. This would be done through a desk review of similar projects and consultation with the MoD.

9.6 Archaeology and Cultural Heritage

This section outlines the historical environment within the onshore and offshore scoping area. The section is informed by historical records provided through Coflien historical records database[69].

9.6.1 Baseline

9.6.1.1 Onshore

Anglesey has a long history of occupation since at least the pre-historic period (approximately 7000BC)[70]. Anglesey has been an important site in the discovery of buried pre-historic artefacts. Anglesey was also an important Roman site, home to major conflicts between the Roman and local Celtic populations. Anglesey has also had an important post-Roman history including important Viking and middle age historical finds.

Holy Island has some important historic monuments including the Ty Mawr Standing Stone and the Trefignath burial chamber. There is also Penrhos Country House which has a cluster of outbuildings and folly's associated with it. As well as the remains of Holyhead Castle and WW2 pill boxes at Solders Point.

On the west coast of Holy Island there are historical monuments overlooking the coast and seascape. Examples include burial cairns, country house, South Stack lighthouse and Henborth Old Harbour. A full review of monuments with the potential to be impacted will be undertaken during the EIA.

In the wider onshore scoping area the density of recorded monuments becomes lower and there is a wide variety of monument types recorded including; barrows, standing stones, farm houses, coastal ports, cairns and chapels.

Figure 9-7 shows the heritage assets located in and around the onshore scoping area. There are seven Scheduled Ancient Monuments (Caer y Twr, Holyhead Mountain Hut Circles, Penrhos Feilw Standing Stones, Plas Meilw Hut Circles, Porth Dafarch Hut Circles, Ty-Mawr Standing Stone and Trefignath Burial Chamber) and 22 Listed Buildings in the onshore scoping area[71]. Holyhead Mountain Conservation Area is not located within the onshore scoping area; however, due to the significant outward views, it will be considered within the EIA. The onshore EIA will be supported by a detailed Cultural Heritage record and Heritage Impact Assessment (HIA) including proposals for appropriate mitigation measures.

[69] *Coflein Historical records database http://map.coflein.gov.uk/ (accessed January 2018)*
[70] *Anglesey History http://www.anglesey-history.co.uk/anghist.html (accessed January 2018)*
[71] *Historic Wales https://historicwales.gov.uk (accessed February 2018)*

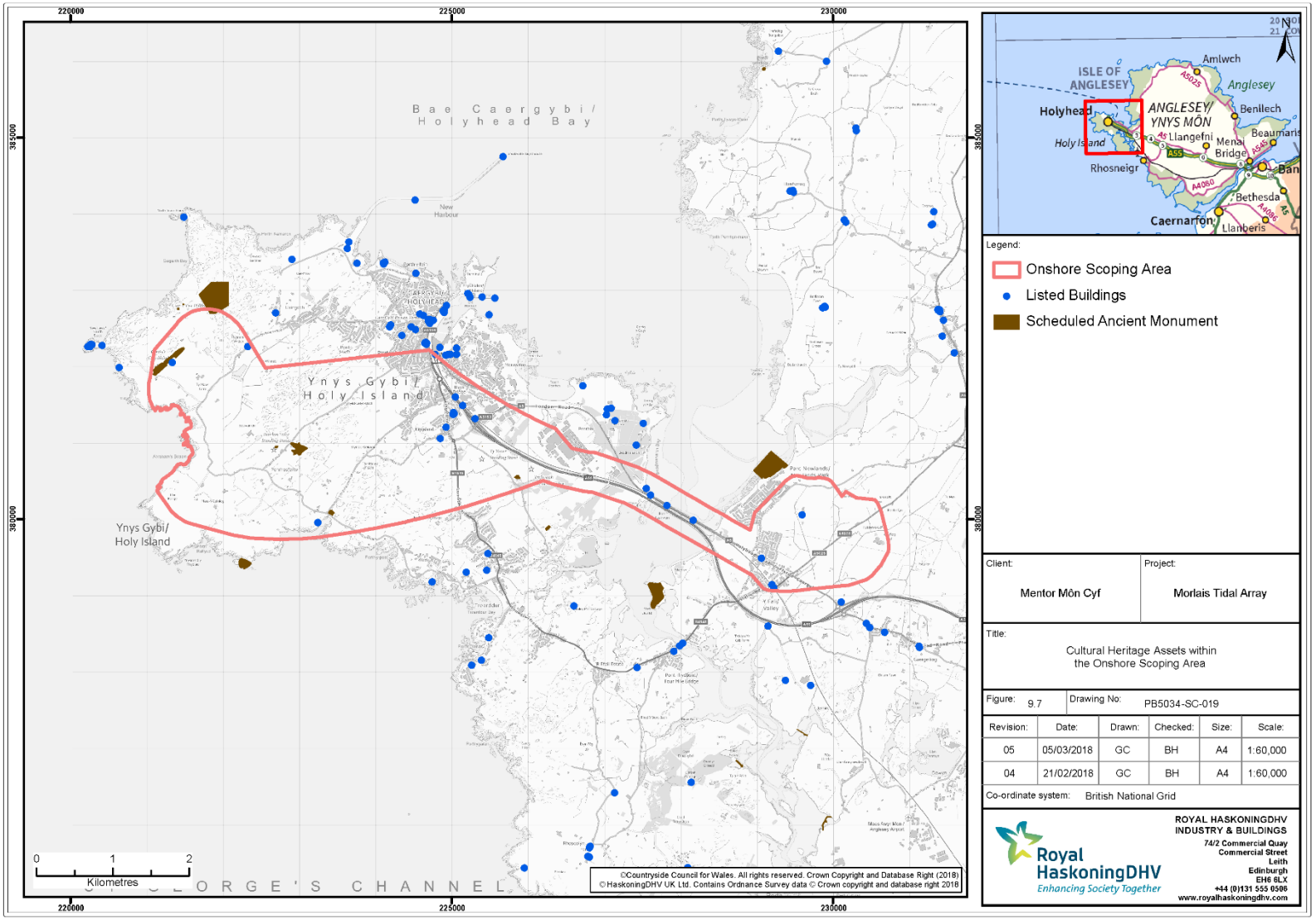


Figure 9-7 Cultural heritage assets within the onshore scoping area

9.6.1.2 Offshore

Holyhead Harbour is a historic harbour with a long maritime heritage. The waters around the west and north coast of Anglesey have a combination of a high energy wave and tidal regime with a rocky coastline and offshore rocks making it a particularly dangerous coastline in terms of shipping. Unsurprisingly, the coastal area adjacent to the offshore scoping area has a high number of reported wrecks. In addition, the historic presence of RAF Valley and low flying practice areas also increases the potential for submerged military aviation heritage to be present.

Within the offshore scoping area (not including the cable route) there are approximately seven recorded wrecks, including three aircraft of military origin.

There are numerous wrecks recorded throughout the cable route, with approximately 9 recorded around the embayment identified for landfall (in the area of Penrhos Feilw, to the south of South Stack lighthouse). There is also a submerged forest recorded within the intertidal area of Penrhos Beach. The density of wrecks tends to be highest around the coastline and associated with coastal rocks. In particular, there are clusters of wrecks around the North and South Stack.

9.6.2 Potential Impacts

Table 9-7 Potential impacts on archaeology and cultural heritage

Potential Impact	Phase	Anticipated Significance	Comment
Impact on the historic land scape	All	Potential impact significance unknown	The presence of manmade structures in previously undeveloped and historical settings has the potential to impact on the historical setting and landscape of a feature. The significance of the impact will be dependent on the importance of the historical setting and the final design nature of the MDZ. Impacts will be reduced by installing cables within existing infrastructure network as far as possible.
Physical disturbance of buried historic and prehistoric land surfaces and archaeological finds	Construction and Decommissioning	Potential impact significance unknown	There is the potential to disturb or damage buried historical or archaeological features. This is a potential across the scoping area, but is likely to be more of a consideration at the landfall and substation sites where substation and cabling is more likely to require the use of previously undeveloped land.
Physical disturbance of terrestrial historical artefacts	Construction and Decommissioning	Potential impact significance unknown	There is the potential to disturb or damage buried unknown artefacts during cable burial or substation ground preparation works. This is particularly the case if

Potential Impact	Phase	Anticipated Significance	Comment
			works are being undertaken in previously undisturbed ground; however, the significance can be reduced through standard industry guidelines such as the use of a watching brief.
Indirect disturbance to submerged historic or prehistoric land surfaces and archaeological finds as a result of changes to the hydraulic and sedimentary regime	Operation	Potential impact significance unknown	The significance of impact will be dependent on the nature of any changes to physical processes caused by the Project as well as the location and sensitivity of any historical interest features.

9.6.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- The volume and nature of interest features with the potential to be impacted 1) visually, and 2) physically, by the construction or operation of the Project. This would be done through a thorough review of Coflein (National Monuments of Wales), Cadw, Royal Commission on Ancient and Historical Monuments of Wales (RCAHMW) and Archwillio historical data records (Gwynedd Archaeological Trust records). In addition to this, walk over survey maybe required.
- The importance of the site and the visual sensitivities to be considered.
- Review of subsurface historical interest features using existing bathymetric data and geophysical data. Anomalies would be identified by a marine archaeologist to identify potential artefacts. Additional data analysis or gathering of sub-bottom profile data or magnetometer data may also be undertaken.
- Appropriate Best practice and mitigation techniques to be determined through the EIA in consultation with cultural heritage stakeholders.
- The following best practice guidance will be used to inform the EIA:
  - Historic Environment Guidance for Wave and Tidal Energy.
  - Historic Environment Guidance for the Offshore Renewables Energy Sector.
  - Collaborative Offshore Wind Research into the Environment (COWRIE) Guidance for the cumulative impacts on the historic environment from offshore renewable energy.
- Whilst the EIA will determine the significance of potential impacts to archaeological and cultural heritage assets, it is anticipated that a Written Scheme of Investigation (WSI) will be agreed with relevant stakeholders and permission sought prior to any excavation works being conducted.

9.7 Noise and Vibration

The following section discusses in-air noise and vibration within the onshore and offshore scoping area. Potential impacts on marine receptors from noise and vibration are discussed in the relevant receptor sections of this report. Potential sensitive marine receptors include marine mammals and some fish species (Section 8.3 and Section 8.4).

9.7.1 Baseline

9.7.1.1 Onshore

There is little site-specific information on noise and vibration in the onshore scoping area.

The onshore components are likely to be located in areas of open land and away from major residential noise receptors, although several potential locations have noise receptors in close proximity which would need to be considered once the final decision on substation location has been made.

The potential landfall and substation locations are in open rural areas. Receptors in these areas are sparse; however, individual residential and tourist receptors may receive some noise disturbance during construction depending on the final chosen locations.

Due to the extent of onshore cable route required between substation and grid connections it is likely that individual residential receptors will need to be passed. Cable routes to grid will largely avoid settlements, particularly if accessing the 33kV connection at Parc Cybi or 132kV connection at Orthios Holyhead Eco Park, although residential receptors at Kingsland would need to be routed past for some routes. Should the 132kV Valley connection be chosen, cabling works would be likely to pass to the north of Trearddur and receptors at Valley during the approach to the 132kV grid connection point. These receptors at Penrhos and Valley would need to be considered within the EIA.

9.7.1.2 Offshore

Airborne noise offshore is likely to be generated by a mix of anthropogenic and natural sources. Noise emitted by vessel traffic is expected to be the main source of anthropogenic noise within the site. Wind, wave and precipitation activity offshore would be the primary sources of natural airborne noise.
Construction activities have the potential to increase airborne noise within the offshore scoping area. The main sources of noise would be from increased vessel activity and device installation.

The MDZ is 0.5km from shore at its nearest point therefore it is unlikely that onshore receptors will be impacted by increases in offshore noise from the Project. There are limited offshore receptors that would be impacted by in-air noise from the Project. Disturbance to biological receptors will be considered within the relevant sections for those topics.

Nearshore construction activities that will generate airborne noise will be limited to installation of the export cable, which will require ploughing, trenching or jetting the cable. In general, noise generated by cable laying vessels is generally low and is unlikely to be significantly elevated above background levels. Vessel based works inshore will also be short in duration.

During operation, movement of the TECs would be expected to cause low levels of airborne noise; however, given the distance between the MDZ and the shore it is not considered turbine noise will be audible to onshore receptors.

During decommissioning, there is the potential for some offshore decommissioning activities to create airborne noise, although it is expected that this would be lower than during the construction phase.

Due to the limited pathway for offshore airborne noise to impact receptors it is proposed that offshore airborne noise is scoped out of the EIA for further consideration.

9.7.2 Potential Impacts

Table 9-8 Potential impacts caused by noise and vibration

Potential Impact	Phase	Anticipated Significance	Comment
Increased noise from construction activities onshore	Construction	Potential impact significance unknown	Construction activities and increased traffic associated with construction may increase background noise levels. The significance of this would be dependent on existing conditions and the presence of sensitive noise receptors in the vicinity of the cable route or substation location.
Increased noise from use of Holyhead Harbour as main construction and operational port	All	Potential impact significance unknown	If Holyhead Harbour was chosen to be used as the main construction port there would be an increase in construction based activities such as loading and unloading and engineering works which would be likely to increase in background noise levels. Additional road traffic transporting materials and personnel to the port would also increase road traffic noise, particularly in the vicinity of the harbour entrance. There would also be increased noise associated with vessel activity.
Increased noise disturbance due to construction of the landfall and transition pit (if required).	Construction	Potential impact significance unknown	There would be an increase in noise levels during the construction of the landfall and transition pit (if required). The significance of noise disturbance would be dependent on the presence of sensitive receptors.
Increased vibration due to cable trenching and construction activities	Construction	Potential impact significance unknown	Construction activities such as HDD and trenching for the cable installation have the potential to cause vibrations. The significance of vibrations would be dependent on the chosen installation method and the presence of sensitive receptors.

9.7.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Identification of baseline noise conditions. It is likely that this would be done through a combination of desk review and site-specific survey.

9.8 Air Quality

This section outlines air quality within the scoping area. Little site-specific information is available so this section is informed by air quality reporting from Anglesey as a whole.

9.8.1 Baseline

9.8.1.1 Onshore

In general, air quality on Anglesey and more specifically Holy Island, is within the air quality objective of 40µg/m^3. During routine air quality monitoring (2012[72] & 2013[73]), this air quality objective was only exceeded as one location which was at the kerbside of the A55 at Llanfairpwllgwyngyll. The value at this site was measured at 49.4 µg/m^3. PM10 monitoring of four locations in Anglesey also recorded levels below the Welsh Governments 24 mean objective of 50µg/m^3 and the annual mean of 40 µg/m^3.

The scoping area is mainly rural and would be expected to have relatively good air quality. There may be isolated areas of poorer air quality associated with car traffic around popular tourist areas such as South Stack or dust created through agricultural work. However, in general air quality in rural areas outside of Holyhead would be anticipated to be good and have low levels of particulates.

Installation of the landfall, cable route and substation would be expected to result in localised increases in dust and emissions from plant or HGVs. During the operational phase, there would be no significant sources of dust or emissions.

The EIA would fully consider the impact of construction, operation and decommissioning on air quality receptors. It is proposed that, in particular, the EIA will focus on the impact of any increases in dust and emissions on road and transport links, nearby sensitive receptors (tourist sites, residential properties etc.) and protected sites. Within the scoping area, Holyhead is anticipated to contain numerous sensitive receptors which will require full consideration, both in terms of increased traffic associated with the Project and any cable installation works required.

9.8.1.2 Offshore

Exhaust emissions from vessels operating offshore are expected to be the main source of atmospheric emissions with the potential to impact air quality. Pollutants emitted from vessels operating at sea are likely to be sulphur dioxide (SO_2), nitrogen oxides (NO_x) and particulate matter.

Engine emissions from vessels active during construction, operations and maintenance and decommissioning will contribute to atmospheric emissions from shipping traffic at a small scale. However, the number of vessels active on site would be negligible in comparison with the number of vessels active regionally and would contribute a fractional amount to existing air quality.

Whilst there might be a negligible increase in background emission levels, there are no receptors nearby that are likely to be impacted by the increase.

It is therefore proposed that air quality (offshore) is scoped out of any further assessment as there is expected to be only a negligible increase in emissions with no nearby receptors.

9.8.2 Potential Impacts

Table 9-9 Potential impacts on air quality

[72] *IoCC (2012) Air Quality Updating and Screening Assessment for IoCC. http://www.anglesey.gov.uk/download/33329*
[73] *IoACC (2013) Air Quality Progress Report for IoACC. http://www.anglesey.gov.uk/download/38554*

Potential Impact	Phase	Anticipated Significance	Comment
Increased emissions onshore during construction	Construction	Potential impact significance unknown	Construction activities would be expected to result in increased levels of traffic to the onshore construction area. Increased traffic would be the result of both construction plant and construction workers traveling to the site. Increased traffic has the potential to result in increased emissions in the local area, although the significance of this will be dependent on the baseline conditions of the area. Construction activities, in particular, excavation works are likely to temporarily increase the levels of particulate matter and dust in the air. The significance of this will depend on the nature of the soils being excavated, the duration/volume of excavation and the existing baseline conditions.
Increased CO_2 and NO_2 emissions due to increased vessel and industrial activity at the Holyhead Harbour	All	Potential impact significance unknown	The significance of the impact will be dependent on whether Holyhead Harbour will be used as the main construction port. Increased vessel presence and activity would be expected to increase emissions from marine engines within the harbour. In addition, increased onshore activity from plant undertaking activities such as vessel loading and unloading and transportation of equipment may result in increased localised emissions and particulate matter. During operation, there is also the potential for increased emission through long term use of the harbour by work vessels. The significance of this will be dependent on the anticipated level of vessel activity during the construction phase.
Increased emissions offshore due to increased vessel activity	All	Potential impact significance unknown (predicted to be not significant)	Increased vessel activity offshore would be expected to increase emissions from baseline conditions. Levels of

Potential Impact	Phase	Anticipated Significance	Comment
			emissions would be higher during construction with lower levels of vessel activity expected during operation. It is worth noting that levels of emissions are likely to be low to moderate and dispersal offshore is likely to be rapid. It is therefore assumed that the significance of the impact would be not significant.
Long term reduction in CO_2 emissions and contribution to meeting national emissions targets	Operational	Beneficial	The purpose of the Project is to contribute to the low carbon energy objectives of Wales and the UK in line with national policy. One of the main aims of the Project is to aid in progressing tidal technology towards widescale commercial roll-out and as such, is expected to have a positive contribution to national low carbon objectives.

9.8.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Site specific air quality information to inform the assessment. This would require a through literature review of existing baseline conditions and a site-specific survey to determine baseline levels. Site specific survey would focus on onshore receptors around the Harbour, onshore cable route and substation location when known.

9.9 Tourism and Recreation

9.9.1 Baseline

Anglesey was granted United Nations Educational, Scientific and Cultural Organisation (UNESCO) status for the island's geology, which has the potential to boost local tourism. Holy Island, and Anglesey in general, is a popular destination for tourists. Holyhead is the main hub for tourism on Holy Island, however, Holy Island is popular with tourists undertaking various activities.

Walking and climbing are popular activities along the coastal paths of the north and west of Holy Island and in the interior around Holyhead Mountain. The small, isolated beaches on the west coast such as Porth Dafarch are also popular leisure locations for residents and tourists.

South Stack is a notable popular tourism location within the onshore scoping area and there are several sites of historical importance which attract tourists, including the Ty Mawr Huts on Holyhead Mountain and the Penrhos Fellw Standing Stones.

The onshore scoping area includes sections of walking routes, particularly the coastal paths. There is the potential for cable installation works to cause some disturbance to coastal path users, which will be considered fully within the EIA.

Holy Island is a popular destination for water sports enthusiasts and sailing enthusiasts with a significant area of the west coast of Anglesey identified as a UK sailing and racing area. Recreational sea fishing is also an important activity in the scoping area, with both coastal fishing and chartered fishing vessels being popular activities. The EIA will consider the potential for onshore and offshore works to restrict or impair access to amenities for these sports.

As far as possible workers will be employed from the surrounding area; however, it is likely that for some skilled roles it may be necessary to bring workers in from a wider area (nationally). This is particularly likely during the construction phase. This would require accommodation on Anglesey to be available to house workers not based within commuting distance. This would be expected to result in economic benefits but may also result in pressure being put on accommodation that would otherwise be used by tourists visiting the area.

9.9.2 Potential Impacts

Table 9-10 Potential impacts on tourism and recreation

Potential Impact	Phase	Anticipated Significance	Comment
Offshore - Industrialisation of the local seascape reducing tourists, including sailing enthusiasts and sea fishing, visual amenity	All	Potential impact significance unknown	Increased vessel activity at the offshore site and along cable routes during construction, within the context of existing shipping and marine energy related vessel activity in the area, is unlikely to have a significant effect. Vessel presence during operation and maintenance and decommissioning is likely to be minimal and of a temporary nature. The impact of any permanent surface

Potential Impact	Phase	Anticipated Significance	Comment
			piercing structures should be determined.
Increased volume of traffic or installation works restricting or impairing access to recreational amenities	All	Potential impact significance unknown	Increased traffic caused, in particular during construction has the potential to impair travel around Holy Island, in particular on rural roads.
Onshore - Industrialisation of the local landscape reducing tourists' visual amenity	All	Potential impact significance unknown	The installation and sustained presence of any substation and overhead grid infrastructure may reduce the visual amenity associated with an area.
Increased pressure on local temporary accommodation	Construction	Potential impact significance unknown	Increased personnel in Holyhead particularly during the construction phase, may put increased pressure on temporary accommodation, reducing availability for tourists during summer months when construction activities are planned.
Impacts on income and rental markets from incoming construction workers	Construction and Operation	Beneficial	Incoming temporary construction workers are likely to require a range of accommodation types from B&B/hotel accommodation for short term workers to short and long term lets for longer term workers. This has the potential to boost the property rental markets within the area and provide increased and more stabilised income for B&Bs and hotels in the area, particularly if construction activity extends outside of peak tourist season. During the operation phase, long term workers are likely to want to find more permanent accommodation; this may result in a more buoyant long-term rental market. In addition, construction workers will spend some of their disposable income in the area. Menter Môn is committed to maximising beneficial impacts where possible.
Additional topic of interest creating new draw for tourists	All	Beneficial	There is already significant interest in the renewables industry in North Wales through the presence of other

Potential Impact	Phase	Anticipated Significance	Comment
			projects and it is reasonable to assume that the industry may be a key area of interest for some visitors to the Islands. A project of this scale may contribute to this.
Increased vessel activity and industrialised activity at Holyhead Harbour creating a visual impact on tourists arriving from sea	All	Potential impact significance unknown	The presence of construction vessels, as well as industrial activities such as equipment lay down areas, loading and storage activity may increase the impression of industrialisation by visitors entering North Wales by sea via Holyhead. The significance of this impact will depend on whether Holyhead is used as the main construction port and the level of construction and operational vessel activity expected.

9.9.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Identifying key tourist activities, the nature of tourist activity in Anglesey and detailed information of the economic aspects of tourism. This would include the amount of temporary accommodation available within commutable distance, the importance of tourism in terms of spend to the local economy (both direct and indirect) and the number of tourists staying on Anglesey as opposed to passing through on journeys to other destinations. This information would be gathered through a review of existing literature and publications from the IoACC and Welsh Government as well as consultation with local stakeholders and businesses.

9.10 Aviation

This section outlines the baseline aviation conditions within the onshore and offshore scoping area and Holy Island.

9.10.1 Baseline

Anglesey has a single airport, Anglesey/Valley Airport, which is both an airport owned by the Isle of Anglesey County Council on land leased from Defence Infrastructure Organisation (DIO). The RAF Valley entity of the airport is run by the MoD. Details and potential impact for the RAF aviation activity were discussed in Section 9.5.

Anglesey Airport provides flights around the UK and limited European destinations. There are a total of 42 domestic flights per week.

Figure 9-6 in Section 9.5.1 indicates that there are no civilian aviation aerodrome consultation zones within the scoping area, the nearest one being at Caernarfon, however, consultation with RAF Valley would be required and it is assumed that this consultation would also include commercial aviation interests based at RAF Valley.

It is assumed that the onshore infrastructure would not provide a pathway for impacts to aviation receptors and we would therefore request to scope impacts from onshore infrastructure out of the EIA.

9.10.2 Potential Impacts

Table 9-11 Potential impacts on aviation

Potential Impact	Phase	Anticipated Significance	Comment
Impacts on radar systems at RAF Valley	Operation	Potential impact significance unknown	Although there will not be a substantial amount of surface piercing infrastructure, the impacts on radar equipment is not well understood and will be site specific. Consultation with RAF Valley will be required to determine the significance of the impact and potential mitigation measures. It is assumed that there is no pathway for impact to commercial aviation interests from onshore infrastructure.

9.10.3 EIA Baseline Characterisation

In order to inform the EIA baseline, data gathering will focus on:

- Confirmation of the consultation strategy for commercial operators at RAF Valley, it is assumed that this will be through the Isle of Anglesey County Council as they are the airport operators. This consultation will identify key concerns and any requirements in addition to those raised by the MOD.

9.11 Traffic and Transport

This section outlines the traffic and transport environment within the onshore scoping area.

9.11.1 Baseline

9.11.1.1 Road Network

The A55 (North Wales Expressway) is the main route through Holy Island and into Holyhead from Anglesey and the wider road network. The A55 terminates at the port and is also the main transport link for incoming and outgoing traffic to the port and the train station.

The A5 is the other major road which accesses Holyhead from the wider Anglesey road network, the A5 follows a similar route to the A55 Anglesey, passing through Valley and entering Holyhead via Penrhos and accessing the east side of Holyhead Port. Both the A55 and the A5 cross from Anglesey to Holy Island via a bridge across the Cymyran Strait.

Away from the major roads, the road network in Holyhead is typical of an urban environment, mainly consisting of access to shopping streets and residential streets.

Other major roads within Holy Island include the South Stack Road which passes close to the preferred landfall and substation search area and is the main road accessing the west coast of Holy Island from Holyhead. The South Stack Road turns into Lon Isallt, which connects to the B4545 at Treardurr Bay. The B4545 is the main route into Holyhead from the south and connects Treardurr Bay and Holyhead, via the A55. Away from the major connecting roads, roads connecting rural settlements and communities tend to be single or 1.5 lane roads. Within the onshore scoping area, two roads connect the west coast to the outskirts of Holyhead, these are Plas Road and Porthdafarch Road.

9.11.1.2 Rail Network

Holyhead is also the terminus for the North Wales railway line, which connects Anglesey (and North Wales) to the UK rail network via Chester and Crewe. The train line out of Holyhead follows the A55 as far as Valley, before deviating and being routed to the south.

Holyhead station is the only railway station on Holy Island. The station is located adjacent to the A55 and Holyhead port. Within or close to the scoping area there is also the Valley railway station.

Holyhead rail station, provide North Wales and the wider rail network via the North Wales coastal line which operates between Chester and Holyhead.

9.11.1.3 Bus Network

Bus service coverage within scoping area is restricted, and the nearest bus stop to the South Stack is Llanigoch on the 22 bus route. This route follows the South Stack Road between Holyhead and Llanigoch but does not stop at South Stack or the adjacent area.

The scoping area includes both urban and rural road networks as potential options for routing cables. It is proposed that the majority of cable installation would be within or beside the road to reduce or avoid potential impacts to ecology and buried cultural heritage assets, as well as reducing temporary land loss.

Construction of both the onshore and offshore elements of the project is likely to result in an increase in traffic, both to the port and the onshore construction areas. During the operational period some increase in traffic may occur due to permanent workers accessing both the port (for offshore operational work) and onshore works areas.

The EIA will consider impacts to traffic and transport during all phases of the projects lifecycle. It is anticipated that there will be need for traffic management to be required, particularly, if cable is routed within the road network. The requirements for mitigation will be considered within the EIA and developed through consultation with regulators and stakeholders.

9.11.2 Potential Impacts

Table 9-12 Potential impacts on traffic and transport

Potential Impact	Phase	Anticipated Significance	Comment
Disruption to local traffic and access	Construction	Potential impact significance unknown	The nature, duration and magnitude of effects will depend upon the methods by which construction materials, plant and personnel are transported to site.
Temporary increase in traffic	Construction	Potential impact significance unknown	Possible sporadic temporary driver delay and community effects during construction, potential for construction traffic.
Disruption to harbour related traffic	Construction	Potential impact significance unknown	If the harbour is to be the main construction area, increased levels of construction traffic (both equipment and workers) has the potential to impact on other harbour users such as ferry passengers, tourists and workers at the harbour.
Disruption of traffic due to road crossings	Construction	Effect unlikely to be significant	The grid connection route will potentially cross some roads. Significance of disruption will depend on the final crossing method, duration of disruption and the significance of road to road users.
Movement of abnormal loads (cable drums, transformers etc)	Construction	Potential impact significance unknown	Movement of abnormal loads may require Special Order authorisation under Section 44 of the 1988 Road Traffic Act. This will be addressed prior to construction.
Permanent increase in traffic during operation	Operation	Effect unlikely to be significant	TIA (traffic impact assessment) may be necessary but it is anticipated that standard road vehicles will be used in all operations associated with the onshore cable route construction activities.

9.11.3 EIA Baseline Characterisation

In order to inform the EIA baseline and any related traffic planning documents, data gathering will focus on:

- Detailed traffic information to inform a traffic assessment to determine levels of disruption and appropriate mitigation. Data gathering for this would be based on a desk based review of available data sources such as Local Government Data Unit- Wales and IoACC public reports. It is likely that site specific traffic survey would need to be undertaken in the form of peak and average traffic flows.

9.12 Health

9.12.1 Baseline

Human health will be considered within the relevant onshore topics during the EIA, including noise and vibration, traffic and transport, air quality, flood risk and ground contamination. A review of the health interactions of the Project and those in the receiving environment will be drawn from those other assessments.

The assessment will identify potential impacts on the health of the local population in relation to the proposed project. Receptors that are sensitive to potential health impacts will be identified within the topic specific ES chapters, and a review of these will be presented within the health impact assessment.

9.12.2 Potential Impacts

Table 9-13 Potential impacts on health

Potential Impact	Phase	Anticipated Significance	Comment
Noise disturbance	Construction and Decommissioning	Potential impact significance unknown	Potential health related effects experienced during construction and decommissioning would be determined through the topic specific assessments.
Dust and other air emissions	Construction and Decommissioning	Potential impact significance unknown	Potential health related effects experienced during construction and decommissioning would be determined through the topic specific assessments.
Hazardous waste and substances	Construction and Decommissioning	Potential impact significance unknown	Potential health related effects experienced during construction and decommissioning would be determined through the topic specific assessments.
Temporary loss of access to green space	Construction and Decommissioning	Potential impact significance unknown	Potential health related effects experienced during construction and decommissioning would be determined through the topic specific assessments.
Disruption to local road network (reduced access to services and amenities)	Construction and Decommissioning	Potential impact significance unknown	Potential health related effects experienced during construction and decommissioning would be determined through the topic specific assessments.
Noise disturbance associated with the operational substation and National Grid infrastructure	Operation	Potential impact significance unknown	Potential health related effects experienced during operation would be determined through the topic specific assessments.
Generation of EMFs	Operation	Potential impact significance unknown	Potential health related effects experienced during

Potential Impact	Phase	Anticipated Significance	Comment
			operation would be determined through the topic specific assessments.

9.12.3 EIA Baseline Characterisation

There are no specific guidelines for the assessment of health impacts. The NPS for Energy (EN-1) states that where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.

EN-1 indicates that direct impacts on health may include:

- Increased traffic;
- Air or water pollution;
- Dust;
- Odour;
- Hazardous waste and substances;
- Noise;
- Exposure to radiation; and
- Increases in pests.

The assessment will include the identification and review of the potential public health impacts during construction, operation and decommissioning. The findings will be taken from individual chapters from the ES and collated in the health impact assessment chapter. In addition, feedback will be sought from consultees on potential health impacts.

9.13 Socio-Economics

The information in this section is largely informed by data provided by the Local Government Data Unit in their 2013 Report[74] and data provided through the Cymru Infobase website[75]. Due to a lack of Holy Island specific data and as socio-economic impacts can influence a wider area, data from Anglesey as a whole has been included.

9.13.1 Baseline

9.13.1.1 Population

The population of Anglesey in 2016 was 69,723, this was generally lower than other counties in North Wales. Long term population forecasts estimate a slight decrease in population be 2039, with an estimated population size of 68,348 by 2039.

9.13.1.2 Employment

Employment statistics show that 76.8% of the working population of Anglesey were economically active in September 2017. During this period, economically active rates overtook those of Wales as a whole which was 75.7% in September 2017.

In November 2016, 13.3% of the working age population were claiming benefits which was lower than the Welsh average of 14.4%. Multi-year monthly data on claimants of job seekers allowance in Anglesey show that there was a decreasing trend in claimants with a decrease of approximately 1.1% between November 2015 and November 2016.

9.13.1.3 Income

The average income for Anglesey in 2017 was £25,424 per annum which was 3.43% lower than the Welsh average of £26,327. Within the onshore scoping area there were a wide range of average incomes recorded; however, for the majority of the onshore scoping area, income of between £25,326 and £26,203 was recorded in the 2017 Census.

9.13.1.4 Education

Statistics from the Welsh Government's Lifelong Learning Wales Record[76],[77] show that approximately 11.3% of the population between the ages of 20 and 24 were in full or part-time learning. The percentage of the population of working age with no formal qualifications has shown long term decline from 11% in 2011 to 8.3% in 2016, which is slightly above the Welsh national average of 9.5% in 2016[66].

9.13.1.5 Public Services

Public services within the onshore scoping area include daily ferries to Dublin from Holyhead harbour. Holyhead is also the final stop on the North Wales Coast Line which runs along the North Wales coast and connects to wider national services at Chester. There is also a regular bus route which connects Holyhead to Bangor on the mainland.

The development of the Project will generate employment on both a temporary timescale during the construction period and a permanent timescale during the operational period. There will also be wider benefits to the supply chain, both locally and on a national scale.

[74] *LGDU (2013) Economic overview of the Isle of Anglesey: a data analysis of the Island.*

[75] InfoBaseCymru http://www.infobasecymru.net/IAS/eng (accessed January 2018)

[76] *Welsh Government: Statistics for Wales http://gov.wales/docs/statistics/2018/180207-further-education-work-based-learning-community-learning-2016-17-en.pdf* (accessed February 2018)

[77] *Office for National Statistics* https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland (accessed February 2018)

The development of a tidal project such as the MTA requires a high level of technical input. As far as possible workers from the local area will be employed during the construction and operation phases of the Project; however, where specialist roles cannot be resourced locally, it may be necessary to bring in specialist workers from a wider area. There may be the potential for local personnel to be trained to fill some resourcing requirements; however, it is likely that technical specialists may need to be brought in from a national level, particularly during the construction period.

Importing workers to Holy Island may result in positive impacts to the local economy in terms of bringing wealth and regular income to local service providers; however, large numbers of workers requiring accommodation may but pressure on other industries such as tourism if there is not sufficient accommodation available. The EIA will aim to support the Well-being of Future Generations (Wales) Act 2015 in its objectives to improve the social, economic, environmental and cultural well-being of Wales. Therefore, the interaction of these impacts would be fully considered within the EIA. In addition, the benefits of creating local jobs and the impacts on the wider supply chain will be assessed within the EIA.

9.13.2 Potential Impacts

Table 9-14 Potential impacts on socio-economics

Potential Impact	Phase	Anticipated Significance	Comment
Local employment and business opportunities	All	Beneficial	The development will result in significant opportunities for local residents and businesses throughout the projects lifecycle. Local opportunities will be maximised where identified.
Wage Inflation	All	Potential impact significance unknown	The Project, alongside other energy projects may attract high wage earners to Anglesey, including the scoping area.
Improvements to infrastructure and facilities	All	Beneficial	The Project is expected to result in external investment to local infrastructure, including transport network, Holyhead Harbour and public services.
Population increase	All	Potential impact significance unknown	The Project will create jobs which may cause a migration of workers to the area, initially for the construction phase but potentially for skilled, long term employment during the operational phase. Consideration will be given to Welsh language impacts during the construction phase if using nationally-based workers.
Change in Population distribution	All	Potential impact significance unknown	Workers employed directly or indirectly as a result of the Project may relocate to be closer to the Project,

Potential Impact	Phase	Anticipated Significance	Comment
			including the onshore scoping area and wider Anglesey and North Wales area.
House Price Inflation	All	Potential impact significance unknown	An influx in workers into the area could result in a higher house or rental prices depending on the availability of homes and relocation preferences. This could benefit existing home owners but have negative implications for first time buyers.
Pressure on local utility services	All	Potential impact significance unknown	Increases in population through worker migration could lead to additional pressures on local services.
Improvements to local transport services	All	Beneficial	Increased population through worker migration may result in increased demand on public transport which may lead to additional investment.

9.13.3 EIA Baseline Characterisation

The Overarching National Policy Statement for Energy (EN-1) recommends that where the project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the ES. These may include:

- The creation of jobs and training opportunities;
- The provision of additional local services and improvements to local infrastructure;
- The impact on tourism;
- The impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure; and
- Cumulative impacts.

There is no set of recognised standards for the assessment of socio-economic impacts. In light of this, the socio-economic assessment will present a qualitative assessment of the anticipated impacts and benefits, their extent and when they are expected to occur.

The absolute scale of economic impacts (i.e. the number of jobs which construction, operation and maintenance, and decommissioning activity is expected to support) would be calculated using an approach consistent with methods for economic impact assessment set out in HM Treasury Green Book[78]. The socio-economic impact magnitude will be determined by consideration of the predicted deviation from baseline conditions.

In order to inform the EIA baseline, data gathering will focus on:

[78] *HM Treasury (2003). The Green Book. Appraisal and Evaluation in Central Government* https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-govervent (accessed February 2018)

- Census data and other sources to attain up to date population information on population numbers and distribution.
- A survey of local businesses and discussions with business opportunities to gather more detail on employment, income and labour availability.
- Discussions with local business and business opportunities to ascertain capabilities for a local supply chain. Review of industry generated papers and research (e.g. Crown Estate Socio-Economic Projects).
- Discussions with local housing association, housing developers and a review of local housing and rental market to ascertain further information on housing availability and pricing.
- Desk review of local investment plans.
- A detailed economic impact assessment, including further information regarding jobs (numbers, type, quality, breakdown of skills).

10 Cumulative Impacts and In-Combination Effects

10.1 Baseline

10.1.1 Onshore

The following developments are being proposed within the onshore cable route and would need to be considered in terms of onshore cumulative impacts:

- The Land and Lake holiday resort, which would be to the east and north of the landfall;
- Residential housing to the south of the Parc Cybi;
- Lateral Eco Parks/Orthios Holyhead Eco Park- a plan to convert the Anglesey Aluminium site and surrounding area into a biomass plant (grid connection option);
- Horizon Nuclear Power Plant- the development of a new nuclear power station on the site of the existing Wyfla;
- National Grid options for upgrading the grid; and
- Stenaline Holyhead Port.

Due to the nature of the road network on Holyhead and locations of proposed projects, there is some potential for impacts on receptors should construction timescales with other projects overlap. The level of impacts will be dependent on the final location, construction timelines and requirements of both the MTA and other consented projects. These will be fully considered within the EIA.

10.1.2 Offshore

There are several other energy projects and terrestrial development planned in the vicinity of the MDZ, including the Minesto Holyhead Deep Green project and plans for residential and leisure facilities around Penrhos. The significance of the impact will be dependent on the final project design and the nature, extent and timescales of other relevant projects.

In total Minesto has been awarded a 10MW AfL for the Holyhead Deep Green project. Installation will take place in phases, with 0.5MW installed in the first phase. It is proposed that the export cable from the Minesto project links with that of the MTA and that both projects have a joint landfall and onshore infrastructure. The overall duration of the development will be 10 years.

10.2 Potential Impacts

Table 10-1 Potential impacts due to cumulative impacts

Potential Impact	Phase	Anticipated Significance	Comment
Cumulative impacts on offshore construction of developments	Construction and Operation	Significance of impact unknown	There could be cumulative impacts on a range of topics that would need further consideration, these would include: • Physical processes; • Benthic ecology; • Marine megafauna; • Ornithology; • Fish and migratory fish; • Designated sites;

Potential Impact	Phase	Anticipated Significance	Comment
			• Shipping and Navigation; • Commercial fisheries; • Traffic and transport (associated with harbour activities) • Seascape; and • Socio-economics.
Cumulative impacts on onshore construction and operation of developments	Construction	Significance of impact unknown	As the onshore infrastructure is proposed to be the same for both projects there should be no additional impact onshore, with the exception of: • Socio-economic, and • Traffic and transport. The level of impact will be determined by the final location of the substation location, the timelines of other proposed projects.

10.3 Proposed Approach for Cumulative Impact Assessment

10.3.1 Scope of Cumulative Impact Assessment

The cumulative impact assessment (CIA) will consider all projects of relevance to the MTA. A single CIA will be undertaken which will consider both offshore and onshore elements. The scope of the CIA will focus on:

- Relevant onshore or offshore projects that have been consented and are yet to be constructed;
- Relevant onshore or offshore projects for which an application has been submitted but which are not yet consented; and
- Relevant onshore and offshore projects for which a scoping report has been submitted (although any assessment made in relation to such projects is likely to be qualitative).

It is proposed that, depending on the outcome of initial scoping, the types of projects that would be considered in the CIA would include:

- Tidal energy projects;
- Wave energy projects;
- Offshore wind energy projects;
- Offshore infrastructure projects;
- Oil and gas developments;
- Aquaculture (new applications/reviews);
- Dredging and disposal of dredged material;
- Cables and pipelines;
- Coastal developments;

- Onshore infrastructure projects;
- Onshore wind energy projects; and
- Biomass and other energy projects.

All receptors that are to be considered as part of the EIA will initially be considered as part of the CIA, with the aim of removing receptors from the scope where no pathway to an impact can be predicted. Once relevant sources and receptors have been identified, possible pathways will be identified. Where no pathways exist, cumulative impacts can be ruled out. The spatial extent and refinement of projects will be informed through this 'screening' process. The CIA will be undertaken following the same processes and methodology used during the EIA and the scope of the CIA agreed through consultation with MMO and NRW.

11 Summary

11.1 Summary of Baseline Conditions

11.1.1 Physical Environment

The offshore environment around Anglesey is driven by exposed wave conditions and strong tidal regimes. These drive coastal geological and sediment transportation processes along the west coast of Holy Island. The coastal area around Holyhead is relatively sheltered area only receiving direct waves from a north or northwest direction. The coast around Holy Island is typically a mix of rocky headland and cliffs, interspersed with sand bays, with some areas of extended sand and soft clay cliffs around estuaries.

The onshore environment is a mix of developed and rural areas. Holyhead Mountain is predominant geological feature. In the area of the likely onshore cable route and substation location it is expected that the area will consist of a low topography with shallow topsoil and limited hydrological receptors.

11.1.2 Designated Sites and Biological Environment

Holy Island, Anglesey and the wider North Wales area is a relatively undisturbed and undeveloped area and has important terrestrial and coastal ecological area. Anglesey supports a high diversity of coastal bird species with important coastal breeding sites for auk, gull and terns as well as a potential foraging ground for birds from SPAs further away.

The offshore scoping area is potentially of moderate importance to grey seal and harbour porpoise but likely to be of low importance to other marine megafauna. It is also not likely to be of particular importance to fish species of commercial or natural heritage importance.

11.1.3 Human Environment

Within the general scoping area, Holyhead is the main urban area. Outside of Holyhead itself there are no significant settlements with most residential properties being in small clusters of several properties or isolated farms.

Holyhead is also the main economic centre within the scoping area, with an active port, services, local amenities and tourism being the main sources of income. Outside of Holyhead, tourism and agriculture are main sources of jobs and income.

Holyhead is an important port within the North Wales area, with tourists entering and leaving North Wales by sea through Holyhead Port. It is also the terminus of the A55 which is the main road connecting Anglesey and North Wales to the UK national motorway network.

The onshore scoping area has a mix of urban and rural environments with a significant road network in and around Holyhead, including the A55 which is the main route to the mainland. RAF Valley is positioned on the west coast of Anglesey and both offshore and onshore scoping areas are under a low-level military flying area.

Tourism is an important economic driver in Anglesey. On Holy Island walking, wildlife watching and recreational water sports are the main tourist activities. There are also several cultural heritage interest features which local are tourist attractions.

The offshore scoping area is used by recreational sailors and is a UK sailing and racing area. Up to nine cruise routes also go through the offshore scoping area to approach Holyhead Harbour. In terms of

commercial fishing, the area is not heavily fished, although small local shell fishing vessels are likely to use the area. The coastal area is an important recreational area and views of undeveloped seascapes are valued by recreational visitors. Holyhead Harbour is a key economic driver and brings significant amounts of tourists into Anglesey and North Wales from ferries from Ireland and regular cruise stop-offs. The Harbour is also important as a commercial loading and unloading area.

11.2 Topics to be Scoped Out

We would look to scope the following topics out of the EIA.

11.2.1 Onshore

11.2.1.1 Aviation

There is no pathway which would result in impacts to commercial aviation receptors at the Valley airfield from the installation of onshore infrastructure. We would therefore request to scope it out of the EIA assessment.

11.2.2 Offshore

11.2.2.1 Physical Processes

Reduced energy in tidal currents from energy removed by tidal devices: previous studies for other projects such as PTEC and SeaGen have found little evidence of significant changes to tidal strength downstream of devices and have predicted no significant impacts on coastal processes.

Changes to wave climate from submerged and surface piercing infrastructure: EIA and monitoring studies from other surface piercing technologies, namely offshore wind, have found no evidence to suggest that surface piercing devices significantly alter wave climate or strength inshore of project areas.

11.2.2.2 Geology

Due to the limited nature of the onshore development it is anticipated that there would be no impacts on the geology environment.

A1 Formal Scoping Responses

Previous scoping reports were submitted under the Electricity Works (Environmental Impact Assessment) England and Wales) Regulations 2000 (as amended) and scoping opinions were received in response to both previously submitted scoping reports. Table 11-1 summarises the formal scoping responses received from statutory consultees.

Table 11-1 Formal Scoping Responses

Consultee	Comments	Action Taken
Onshore		
Description of the Proposed Development		
IoACC	The Applicant should ensure that the description of the proposed development that is being applied for is as accurate and fixed as possible as this will form the basis of the EIA. The Applicant should be aware that the description of the development in the ES must be sufficiently certain to meet the requirements of Schedule 4 of the EIA Regulations when the planning application is submitted. Should flexibility be required this should be stated explicitly within the project description chapter. The EIA should assess a worst case as it may pertain to individual environmental topics. Paragraph 3.2 of the SR refers to the unknown technology and infrastructure requirements of the offshore element and the need for flexibility. By contrast, the onshore element requirements are relatively well-understood. The Applicant's attention is brought to PINs Advice Note 9: Rochdale Envelope.	Acknowledged. The project description chapter of the ES will provide a detailed discussion of the proposed development, including where flexibility may be required.
IoACC	The ES should include a clear description of all aspects of the Proposed Development at the construction stage and include: 1. Land use requirements. 2. Site preparation. 3. Construction processes and methods. 4. The duration, phasing of programme; construction materials, methods and activities associated with each phase; siting of construction compounds (including on and any off site); lighting equipment/requirements. 5. An estimate of residuals and emissions by type, quantity, composition and strength (including water, air and soil pollution, noise, vibration, light and heat radiation) during the construction phases of the development together with measures to mitigate emissions which should be incorporated where appropriate in an outline Construction Environmental Management Plan "CEMP" to be submitted with the ES. 6. The number, movements and parking of construction vehicles (including Plant & Machinery etc., Heavy Goods Vehicles "HGV", Light Goods Vehicles "LGV" and staff) should be clearly indicated in the ES which should be accompanied by an outline Construction Traffic Management Plan "CTMP". Transport site access routes for construction traffic and any vehicles carrying abnormal loads in connection with the development on the public highway should also be clearly indicated within the ES as part of the CTMP.	Acknowledged. The ES will include a clear description of the development, including points 1-8.

	7. Emissions: water, air and soil pollution, noise, vibration, light, heat. 8. Maintenance activities throughout the duration of the construction phase including land management having regard to ecological, landscape and human receptors.	
IoACC	At paragraph 4.1.5 of the SR deals with the number and extent of requirements for access roads and that any requirements for road alterations will be outlined within the EIA and fully assessed as part of the traffic and transport EIA. They should also be assessed as part of the Ecology EIA.	Acknowledged. The scoping report has been updated with reference to assessment within the traffic and transport ES chapter but also the terrestrial ecology ES chapter.
Comments on the ES Approach		
IoACC	Key Policy and Planning Legislation: Reference to Planning Policy Wales at paragraph 5.3.4 should be to Edition 9 dated November 2016 or any later revision which replaces it.	Acknowledged. The reference has been updated.
IoACC	Key Policy and Planning Legislation: Statutory pre-application consultation (paragraph 5.1.1) will be required if the buildings proposed exceed 1,000 sq. m. or if the site area is 1ha or more in area.	Acknowledged. The scoping report has been updated to reflect that a PAC will be required if the building exceeds these parameters.
IoACC	Natural Heritage Designated Sites: Table 7.1 sites should include reference to local wildlife sites and the Council's Ecological and Environmental Advisor's response is included in Appendix 2.	Acknowledged. The relevant Local Wildlife Sites have been included in the Scoping Report.
IoACC	Natural Heritage Designated Sites: Badgers are known to be present in the area and ecology reports in relation to the development of Parc Cybi for example may provide useful information.	Acknowledged.
IoACC	Natural Heritage Designated Sites: Consideration should be given to any impacts on ancient woodland present at and around Penrhos Coastal Park (paragraph 7.3.4).	Acknowledged. Impacts on ancient woodland at Penrhos Coastal Park will be considered in the EIA.
IoACC	Contaminated Land: Potential for land contamination should be considered if the cables are directed across former Anglesey Aluminium land to the Orthios site for connection to grid (paragraph 8.2.2).	Acknowledged. If the cables are directed across former Anglesey Aluminium land, the potential for land contamination will be considered in the EIA.
IoACC	Hydrology: Regard must be made to the existence of any private water supply which may be located alongside or adjacent to the onshore cable route in order to protect the source from disruption or contamination.	Acknowledged. Consideration will be given to private water supplies within the EIA.
IoACC	Seascape and landscape: The potential for impacts beyond the 500m study area proposed will be relevant for development within the designated Area of Outstanding Natural Beauty and coastal edge.	Acknowledged.
IoACC	Seascape and landscape: The assessment should use: • Natural Resources Wales LANDMAP and relevant guidance notes. • AONB Management Plan 2015-2020 • Anglesey Landscape Strategy Update 2011 • Seascape Character Area Assessment	Acknowledged and reference to guidance documents has been added to the SLVIA EIA baseline characterisation within the scoping report.

	• Wales Coast Path maps.	
IoACC	Seascape and landscape: The following components are identified as the physical components of the proposal. • Export cable to shore and landfall area; and • Onshore cable and substation location;	Acknowledged.
IoACC	Seascape and landscape: Effects should be considered at the construction, maintenance and decommissioning phases. Section 3.2 notes the parameters that would be defined with a Rochdale Design Envelope. The detail should be adequate in order to assess significance.	Acknowledged.
IoACC	Seascape and landscape: The number and location of viewpoints should be agreed with the LPA as part of the LVIA. These should encompass the main receptors listed below: • AONB • Heritage Coast Landscape Character Areas • Seascape Character Areas • Wales Coast Path • Onshore recreation and leisure activities within the study area. • Tourist traffic using the port of Holyhead. • Conservation Areas.	Acknowledged. Menter Môn will continue to consult with the LPA, and in particular on the number and location of viewpoints as part of the SLVIA.
IoACC	Seascape and landscape: The LVIA should also have regard to the possible cumulative effects within the study area of the proposed development with other, particularly energy related development whether existing; permitted or live applications, together with reasonably foreseeable proposals.	Acknowledged. Royal HaskoningDHV follows the IEMA guidelines on undertaking EIA and are IEMA certified EIA practitioners. Our approach to undertaking the CIA will include SLVIA.
IoACC	Seascape and landscape: We advise that a CLVIA cut-off date be agreed with the LPA. This should be at a date close to the preparation of the applicants Cumulative Assessment. A record of live and determined applications is held by, and available from the Planning Service free of charge.	Acknowledged. The CIA cut-off date will be agreed in consultation with the LPA.
IoACC	Seascape and landscape: Proposed mitigation should be included as part of the assessment.	Acknowledged. Development of mitigation measures is included as a focus in the SLVIA EIA baseline characterisation within the scoping report.
IoACC	Seascape and landscape: Should other similar applications be submitted further to the agreed cut-off date (within the study area, and before determination of said application), the LPA may request further cumulative information from the applicant depending of the period of time elapsed since the CLVIA and the number of relevant submissions. Further information on key areas may also be requested subsequent to the submission of the Environmental Statement.	Acknowledged.
IoACC	Archaeology and Cultural Heritage: Table 8.5 should include consideration of designated Conservation Areas as the Holyhead Beach and Holyhead Central Conservation Areas are within scoping area B.	Acknowledged. The scoping report has been updated to include reference to CAs.

	Holyhead Mountain Conservation Area lies directly between sub-areas A and B and given the importance of outward views from this conservation area, should be included. A detailed Cultural Heritage record and Heritage Impact Assessment would be expected as part of the EIA.	
IoACC	Socio-Economic Impacts and Tourism: A detailed Economic Impact Assessment should form part of the EIA. Further information is required regarding jobs (numbers, type, quality, breakdown of skills etc.).	Acknowledged. Royal HaskoningDHV follows the IEMA guidelines on undertaking EIA and are IEMA certified EIA practitioners. Our approach to undertaking the EIA will include a detailed economic impact assessment, to be included in the ES.
IoACC	Socio-Economic Impacts and Tourism: Tourism should be a standalone item within the ES. Full reference should be made to the geology of the Island given UNESCO status. Soldier's Point is part of a site for a large multi-use development and the tourism and other impacts of a cable route here should be fully referenced. Pressures on temporary accommodation to house workers should be included.	Acknowledged. Tourism and recreation has been separated from Socioeconomics within the Scoping Report, and reference made to Anglesey's UNESCO status.
IoACC	Socio-Economic Impacts and Tourism: Statistics quoted in the EIA should be the most up to date available e.g. tourism figures presented date back to 2011 whereas 2015 figures are available.	Acknowledged. Tourism statistics have been updated.
IoACC	Cumulative Impacts and In-Combination Impacts: The list of projects to be assessed in terms of cumulative and in-combination impacts appears limited. The EIA should consider an agreed list of proposals at an agreed cut-off date before submission of the planning application.	Acknowledged. Consideration will be given to a full list of proposals to be included in the cumulative impact assessment, agreed in consultation with the LPA..
IoACC	Environmental topic areas scoped out: The Applicant's SR indicates that the following topics can be scoped out: • MoD Operations • Aviation Whilst general aviation may be scoped out, the potential for impact on MoD operations, described as limited in nature during onshore infrastructure construction and no offshore impacts in the SO, remains a potential and should be fully considered in the ES.	Acknowledged. The potential for impact on MoD operations has been included in the scoping report for consideration within the EIA.
IoACC	Habitat Regulations Assessment Screening: The Applicant's intention to screen the Proposed Development under the Conservation of Habitats and Species Regulations 2010 (Habitat Regulations) (paragraph 5.3.1) is welcomed and the applicant should liaise with statutory and other material consultees as regards the information to be submitted as part of this screening process and the timing of this submission relative to the planning application. Other material consultees could include for instance, Royal Society for the Protection of Birds "RSPB" and the North Wales Wildlife Trust "NWWT".	Acknowledged.
IoACC	Welsh Language Impact Assessment: Consideration should be given to Welsh language Impacts e.g. during the construction phase utilising nationally-based workers.	Acknowledged. The scoping report has been updated to ensure that consideration will be given to Welsh language impacts within the EIA.

IoACC	Non-Technical Summary: The information in the ES must be summarised in a non-technical summary. This should set out the main findings of the Environmental Statement in accessible plain English and Welsh to ensure that the public can comment fully on the Environmental Statement. The non-technical summary should be produced as a standalone document.	Acknowledged. The NTS will be included as a standalone document to the ES.
IoACC	Difficulties in Compiling the Environmental Statement: The ES should contain an indication of any difficulties (technical deficiencies or lack know-how) encountered by the Applicant in requiring information.	Acknowledged. The EIA methodology within the scoping report has been updated to ensure an indication of any difficulties encountered will be included in the ES.
Other Information		
IoACC	Sustainability: The Well-being of Future Generations (Wales) Act 2015 "Well Being Act" places a statutory duty on public bodies in relation to sustainable development based on seven well-being goals. PPW at paragraph 4.2.1 explains that the Planning (Wales) Act 2015 introduced a statutory purpose for the planning system in Wales – any statutory body carrying out a planning function must exercise those functions in accordance with the principles of sustainable development as set out in the Well Being Act. A statement should be provided of how the proposals contribute to the Well Being Act and material planning policies.	Acknowledged. The EIA will aim to support the Well-being of Future Generations (Wales) Act 2015 in its objectives to improve the social, economic, environmental and cultural well-being of Wales.
IoACC	Sustainability: A description of the sustainable aspects of the development and the measures envisaged to prevent, reduce or offset any significant adverse effects on the environment, including global warming energy efficiency, water and waste management should all be addressed and it should be demonstrated how concepts of sustainability underpin all topics considered in the ES.	Acknowledged. The EIA will address the topic of sustainability and demonstrate clearly the measures taken to offset significant effects.
IoACC	Sustainability: It would be acceptable to provide a consideration of the sustainability credentials of the proposed development in a separate stand-alone Sustainability Statement alongside the ES or within an accompanying Planning Statement.	Acknowledged.
IoACC	Other Regulatory Provisions: The IACC recommends that the Applicant should state clearly what regulatory areas are addressed in the ES and that the Applicant should ensure that all relevant authorisations, licences, permits and consents that are necessary to enable the Proposed Development to proceed are described in the ES. Any likely significant effects arising from the Proposed Development which may be regulated by other statutory regimes should be properly taken into account in the ES.	Acknowledged.
IoACC	Other Regulatory Provisions: It will not necessarily follow that the granting of consent under one regime will ensure consent under another regime. For those consents not capable of being included in an application for consent, the IACC will (where relevant) require a level of assurance or comfort from the relevant regulatory authorities that the Proposed Development is acceptable and likely to be approved, before they make a	Acknowledged.

	recommendation or decision on an application. The Applicant is encouraged to make early contact with other regulators. Information from the Applicant about progress in obtaining other permits, licences or consents, including any confirmation that there is no obvious reason why these will not subsequently be granted, will be helpful in supporting the planning application.	
IoACC	Application Strategy: The Applicant is invited to consider liaising with the IACC in relation to the submission requirements in relation to the planning application	Acknowledged.
IoACC	Conclusion: The adoption of this SO does not preclude the IACC from subsequently requesting further information from the Applicant that may be required to determine the planning application, under Regulation 19 of the Town and Country Planning (Environmental Impact Assessment) Regulations 1999 or any replacement regulations. The application strategy should also be aligned with other processes, consents and other significant projects identified within the scope of the cumulative impacts assessment.	Acknowledged.
Dave Jump, Senior Planning and Conservation Officer, IoACC	Archaeology and Cultural Heritage: While the information contained in 8.4.1. is selective and brief I don't have any general issues or concerns with the information. However, Table 8.5 is also selective and appears to have omitted designated conservation areas (CA). Both Holyhead Beach and Holyhead Central CA are inside Scoping area B. The remaining Holyhead CA, Holyhead Mountain CA is not in a scoping area but it does lie directly in between scoping areas A&B and due to the significant outward views from this CA it should also be given some reference.	Acknowledged. The scoping report has been updated to include reference to CAs.
Dave Jump, Senior Planning and Conservation Officer, IoACC	Archaeology and Cultural Heritage: I would expect the Onshore EIA to be supported by a detailed Cultural Heritage record and Heritage Impact Assessment (HIA) including proposals for appropriate mitigation measures prior to, during and after development.	Acknowledged. The scoping report has been updated to include reference to HIA.
David Cowley, Ecological and Environmental Adviser	Onshore Ecology: The Scoping Report has not included local Wildlife Sites, of which there are a number in the study areas. These sites hold identified special wildlife interest, and although not statutory, are a feature in the current (and currently still ongoing) LDP process, as well as being referred to in planning cases. I advise that appropriate proportional consideration of Wildlife Sites should be made in the EIA.	Acknowledged. The relevant Local Wildlife Sites have been included in the Scoping Report.
David Cowley, Ecological and Environmental Adviser	Onshore Ecology: Appropriate consideration of protected species should also be made in the EIA. Species such as those listed in 7.3.1 and 7.3.2 are indeed likely to be in parts of the study areas, and it would be advisable to include Cofnod local records centre data for the areas (with discussion) as part of EIA material, because this will yield some baseline-relevant material over recent years,	Acknowledged. Reference to Cofnod local records centre data has been added to the terrestrial ecology EIA baseline characterisation within the scoping report.
David Cowley, Ecological and	Onshore Ecology: Given the large size of the study areas, it is unclear what level of new survey detail would be practical before more	Acknowledged.

Environmental Adviser	detailed option routes have been outlined, but when there is more clarity on the preferred routes, there will clearly be a need to include more detailed surveys for certain species/groups in planning case material.	
David Cowley, Ecological and Environmental Adviser	Onshore Ecology: It would also be helpful if appropriate workshop meeting(s) could be arranged for relevant council staff (also NRW and possibly other stakeholders) when more details emerge, ahead/at the time of the main onshore application. The onshore works clearly include several different elements and various options for approaches within these, and having a chance to offer thoughts on these in relation to planning and specialist planning areas should be beneficial to the case. Such workshops have proved useful in connection with a number of other Energy Island related projects.	Acknowledged.
Gwynedd Archaeological Planning Service	Archaeology and Cultural Heritage: The potential historic environment impacts of this proposal are substantial and I would concur with the conclusions of the scoping report in that impacts on cultural heritage and archaeological assets (as well as potential archaeological remains / deposits) need to be considered within the EIA and a Written Scheme of Investigation (WSI) must be agreed prior to undertaking archaeological assessment and evaluation work. The relevant stakeholder to agree the WSI in this instance would primarily be Gwynedd Archaeological Planning Service (GAPS), however given the potential scope of the work Cadw and the RCAHMW may also need to be consulted.	Acknowledged.
Gwynedd Archaeological Planning Service	I would also highlight that the scoping report states that Coflein and Archwilio datasets are being used to inform this scoping exercise. These datasets are not to be used for development management or commercial purposes and by using the data in this way the scoping report is in breach of the data access agreement with both Gwynedd Archaeological Trust and RCHAMW. A formal enquiry must be made to both the NMR and HER directly to obtain up to date data which can be used in this context.	Acknowledged. Reference to Coflien and Archwillo data sets within the original scoping reports was in relation to future data gathering requirements and a formal enquiry will be made to obtain this data.
Network Rail	At this stage there are different routes for the proposal shown in the scoping opinion. Once the route has been finalised, and if that route includes access over or under the existing operational railway or works near to the railway boundary, the developer should contact in the first instance Network Rail Easements and Wayleaves team to begin discussions. Email: Easements&Wayleaves@networkrail.co.uk Mark for the attention of Jonathan Sinclair (Network Rail Surveyor). The developer will also need to ensure that protective provision is undertaken for works impacting the railway. The developer will be liable for all costs incurred in facilitating this proposal.	Acknowledged.
NRW	Key Policy and Planning Legislation: Morlais will need to consider the implications of their proposals on the following European Directives: • EC Habitats Directive (protected sites and species measures) • Water Framework Directive	Acknowledged and the scoping report updated to include reference to the Environment (Wales) Act 2016.

	• The requirements of national legislation will also need to be considered, including; • The Wildlife and Countryside Act (1981), as amended by the Countryside and Rights of Way Act (2000) • The Conservation of Habitats and Species Regulations 2010 (as amended) • The Environment (Wales) Act 2016 – (Section 6 and Section 7) – we note that this replaces the Section 40 and Section 42 duty in the Natural Environment and Rural Communities Act 2006 (NERC Act 2006)	
NRW	Geoscience: The three areas of interest are on Secondary B aquifer and currently exemption from water resources licensing for groundwater abstractions. We are aware that there are numerous private water supplies (PWS) located on the Isle of Anglesey and the local authority Environmental Health Officers will have a register of them. The works have the potential to impact small drinking water supplies like PWS – The relevant department within the local authority will be able to advise on this further. Within the areas outlined in figure 1 there are a few historical landfills – there doesn't appear to be any active landfills. There is the potential for land contamination across the areas and any ground works should be mindful of this. Once locations of works are finalised NRW will be able to provide more detailed comments in relation to potential land contamination.	Acknowledged and scoping report updated to ensure reference is made to private water supplies. Land contamination is already discussed in Section 9.2 of the scoping report.
NRW	Flood Risk: With regards to flood risks we would have expected that the Onshore Scoping Report included a section regarding flood risk (or included within Section 6 (Physical Environment)). Of the 3 scoping areas, it would appear that Area A has the least on shore flood risk. To view current day flood zones (for the 1%/0.5% and 0.1% annual exceedance flood probability) please visit our web site. Tidal flood risks can be estimated for various locations along the coast and related to meters Above Ordinance Datum. We would expect any development proposal wholly or partially within the extreme flood outline (0.1% AEP) to demonstrate compliance with TAN15: Development and Flood Risk within a Flood Consequence Assessment for the lifetime of the development. As such sea level rises associated with climate change should be considered and addressed. Should you wish to obtain the extreme sea levels, a formal request should be made via our datadistribution@cyfoethnaturiolcymru.gov.uk It is therefore suggested that consideration is given to addressing the flood risk associated with the onshore works.	Acknowledged and scoping report updated to include reference to flood risk. Flood risk will be considered fully within the EIA and presented in the ES.
NRW	Protected Sites: We agree with the designated sites, species and receptors identified within section 7 of the scoping report, to be included within the EIA and Habitats Regulations Assessments. We note that the Anglesey Terns SPA was not included within the scoping report and should be considered as part of any subsequent planning application along with the other sites identified.	Acknowledged. Anglesey Tern SPA has been included in the scoping report.
NRW	Protected Sites:	Acknowledged.

	We also agree that extra attention needs to be given to ornithological receptors, as well as a section on habitat/ species connectivity, in order to prevent habitat fragmentation and indirect impacts upon receptors, habitats and designated sites.	
NRW	Protected Sites: Although the Scoping Report states that the options for the cable route (8), the onshore substation (8) and grid connection (3) are yet to be refined and narrowed down, scoping area B clearly poses the least disruption in ecological terms, due to being largely urban and having only a small area where there are any designated sites (Holyhead Coast SSSI, SAC and SPA). However, each scoping area needs to systematically cover each ecological receptor in terms of data, survey reports etc. in order to determine the level of impact. We will also expect to see detailed method statements for both temporary and permanent works for each component of the project, in each scoping area, in order to be able to fully understand and assess the work involved and therefore the potential level of impact.	Acknowledged. Detailed method statements will be provided for each component of the project.
NRW	Protected Sites: NRW advise that sufficient information should be provided on the impacts on breeding and non-breeding chough, a qualifying feature of the Glannau Ynys Gybi / Holy Island SPA. The EIA should propose and deliver appropriate mitigation to ensure that the works do not have adverse effects on the site integrity of the Glannau Ynys Gybi / Holy Island SPA. The EIA should assess the likely impacts from disturbance and/or loss of chough foraging areas and, where required, detail proposed mitigation measures.	Acknowledged. It is planned that HRA Screening will be undertaken and consulted upon with the relevant stakeholders. Further assessment will be undertaken as required and presented with the application in the information to support an Appropriate Assessment report. The information to support an Appropriate Assessment report will contain sufficient information to enable the competent authority to carry out an Appropriate Assessment should it determine that one is required.
NRW	Protected Sites: The scoping makes reference to several Schedule 1 listed breeding birds (peregrine and barn owl). These species are protected under the Wildlife and Countryside Act 1981 (as amended). The proposed works have the potential to disturb both barn owls and chough. NRW advise that the ES should include detailed mitigation measures relating to barn owls and chough. NRW can provide advice on the mitigation measures that may be appropriate. Please note, where a Schedule 1 species is likely to be disturbed the applicant will require a Schedule 1 disturbance licence issued by NRW.	Acknowledged. The ES will provide detailed mitigation measures relating to barn owls and chough and an application for a Schedule 1 disturbance licence will be made where required.
NRW	Protected Sites: Any formal planning submission would need to demonstrate that the proposal will not be likely to result in a significant effect on a European site, either alone or in combination with other plans or projects.	Acknowledged. Please see text above on HRA.
NRW	Protected Sites: Anglesey County Council as required by Regulation 61 of the Conservation of Habitats and Species Regulations 2010, should make an appropriate assessment before deciding to approve the proposal which is likely to have a significant effect on a European site in Great Britain. The supporting environmental statement should present sufficient	Acknowledged. Please see text above on HRA.

	information in order to inform any assessment that the local planning authority deems necessary.	
NRW	Protected Species: There are various records of great crested newts, bats, otter and water voles within the scoping zones. Any planning application will need to consider the impact of the proposal on protected species and demonstrate that the proposal will not impact on the Favourable Conservation Status of European and Nationally protected species.	Acknowledged. Please see text above on HRA.
NRW	Protected Species: Should surveys conclude the presence of protected species, then we would expect the applicant to propose and deliver appropriate mitigation and/or compensation schemes, along with Reasonable Avoidance Measures, to ensure the favourable conservation status of the species is maintained. Please be aware that the development may only proceed under derogation licence should surveys confirm presence of species that are protected. Although we will only advise on the above matters of National and International significance, the submission will need to include information about other ecological interests to allow your Authority to take account of your duty under The Environment (Wales) Act 2016.	Acknowledged. Mitigation measures and/or compensation schemes will be proposed where relevant.
NRW	Pollution Prevention: The developer should be aware that any waste excavation material or building waste generated in the course of the development must be disposed of satisfactorily and in accordance with Section 33 and 34 of the Environmental Protection Act 1990. Carriers transporting waste from the site must be registered waste carriers and movement of any Hazardous Waste from the site must be accompanied by Hazardous waste consignment notes.	Acknowledged. An Environmental Management Plan will be produced and will outline waste disposal procedures.
NRW	Pollution Prevention: All works at the site must be carried out in accordance with GPP5 and PPG6: 'Works in, near or over watercourses' and 'Working at construction and demolition sites' which are available on the Gov.uk website. We would expect to see a commitment to pollution prevention and environmental management in respect of waste production to accompany any subsequent planning application.	Acknowledged. An Environmental Management Plan will be produced and will outline all pollution prevention guidelines to be followed..
NRW	Landscape: The scoping areas lie within the context of Holy Island and land to the east of Beddmanarch Estuary. Much of this area lies within the Anglesey AONB. NRW's landscape planning remit relates to Anglesey AONB and includes the consideration of the landscape and visual amenity issues of the proposal in relation to the natural beauty and special qualities evident in the designated areas seascape, coastline and landscape. The scoping areas in relation to the Anglesey AONB: • The majority of Sub-area A lies within the AONB • Sub-area B lies outside of the AONB, but rural areas here potentially contribute to the setting of the designated landscape - particularly Holyhead Mountain • A small section of Sub-area C lies within the AONB in the area of Beddmanarch Bay	Acknowledged. Please see revised scoping area. The EIA will provide a full project description, and will include all components of the scheme.

	• A potential alternative 132kV route to Valley passes through the AONB in the area of Beddmanarch Bay (third grid connection option) • A national grid connection to Wlyfa Newydd (no details of potential route provided at this stage) The development components of the scheme are in the main clear. We require confirmation that an overhead line has been discounted for the grid connections to Valley and Wylfa Newydd. We consider the scoping report has made a reasonable start in setting out the landscape context of the scheme alternatives and outlined the phases of development disturbance in general terms.	
NRW	Landscape: Reference to the Anglesey AONB and development issues is however weak. For example, in section 9 summary of baseline condition, we note that recognition of the high sensitivity of the AONB landscape/coastline and seascape context is absent. Some partial characterisation of the study area has been provided, but little description on the landscape/coastal context for the scoping sub-areas or context for the 132kV potential alternative route to Valley.	Acknowledged. Further emphasis has been placed on the AONB within the scoping report.
NRW	Landscape: The use of Seascape Character Assessment as a framework to present the landscape/seascape baseline is welcomed. The AONB however also includes inland rural landscapes which haven't been referred to. We advise that the full characterisation of the study area will be necessary and should be informed by other published information including – the Anglesey Landscape Strategy; LANDMAP and The AONB management plan, with relevant information verified and supplemented through site assessment work.	Acknowledged. Full characterisation of the study area will be undertaken for the EIA, making use of the identified guidance documents and published information.
NRW	Landscape: We advise that characterisation of the area should start with the framework of the Seascape Character Assessment and then add inland landscape character areas. To make characterisation relevant to the planning purposes of the AONB, details of the characteristics and qualities that contribute to Natural Beauty will need to he highlighted (i.e. areas of scenic quality, distinctiveness and sense of place, tranquillity and wildness with limited influence of development). The AONB management plan highlights a range of Special qualities found across the designated landscape. The characterisation exercise will need to clarify which of these are present and where.	Acknowledged. Characterisation will include SCAs and LCAs and full details of the AONB qualities will be provided in the ES.
NRW	The scoping report proposes to separate out the assessment of effects upon the AONB designated landscape and landscape/seascape character and visual amenity. We consider this could be unhelpful, lead to duplication and additional work by separating out components of the assessment which need to be read together. We would prefer to be able to review both within a single technical appendix, with all landscape and visual issues summed up within a single concluding statement. This allows transparency in the assessment process and conclusions reached. As highlighted above it is possible to include an assessment of impacts upon natural beauty (to judge	Acknowledged. A combined approach will be undertaken to avoid duplication.

	impacts on the purpose of the designation) within the scope of the LVIA.	
NRW	Areas of potential significant effects on the Anglesey AONB: We note that many of the alternatives for landfall, onshore cable routing and 8 of the sub-stations lie within Sub-area A. The majority of this area lies within the AONB and this is our main area for concern based upon the information available at this stage.	Acknowledged.
NRW	Areas of potential significant effects on the Anglesey AONB: Access and views of the coast and inland landscapes are likely to be possible from the Wales Costal Path, open access land, inland roads and lanes. LANDMAP visual and sensory information for the area notes the area has a strong unspoilt rural character, with scattered houses and farms and limited tourism development. The area comprises rolling lowland with marsh and craggy ridges, with small fields lined by stone walls and gorse hedges. The area is open and wind swept with a feeling of maritime openness. There are a number of sensitive issues here that make the successful landscape integration of a substation problematic to achieve. We recommend that in developing the preferred site option and landscape integration, the development proposals will need to demonstrate how it conserves and enhances the landscape to ensure it supports the purposes of the designated landscape. Landscape integration techniques should consider how aspects of built form, colour and control of lighting can assist.	Acknowledged. Landscape integration techniques will be considered during the final site selection process.
Dwr Cymru Welsh Water	In respect of this scoping opinion please note we have no comments to offer at this stage.	Acknowledged.
Offshore		
NRW	Non-Technical Summary: Paragraph 1 on page 2 states that the substation's location and grid connection have not been finalised. The link between the substation and grid connection has not been included within this scoping report. This information must be included in the ES. Any regulatory authority is obliged to consider the potential impacts of the Project as a whole, not just the parts of the Project subject to consent under that particular authority.	Acknowledged. This information was not available at the time of writing as the final location of the onshore infrastructure was not available. That was why the decision was made to scope a wider onshore area to cover all potential infrastructure. All elements being undertaken will be included within the ES.
NRW	Introduction: Section 2.4 states the elements that the development will be comprised of, is used as the basis for consideration of potential impacts in the scoping report. This must include the installation of foundations, and any cable protection (if cable protection is being considered), and any other associated activities throughout the lifetime of the Project such as operation/maintenance and repowering.	All construction/O&M and decommissioning activities that will potentially be undertaken as part of the development will be considered within the ES. This would be done as standard once the development is defined in greater detail. Activities for repowering can be considered in relation to how activities would be undertaken now but would need caveat that future technologies and methods may be considerably different.
NRW	Introduction: Section 2.5.2 states that a shared export cable with the Minesto Deep Green Project is being proposed. It must be made clear who would own and be responsible for the export cable and any associated Marine Licence, and who would be	Menter Môn will be responsible for the export cable route and associated Marine Licence. The details of responsibilities will be included in ES.

	responsible for submission of decommissioning under section 105 of the Energy Act 2004 (as amended).	
NRW	Introduction: The cable route has yet to be decided and no details have been provided of potential options, methods of installation or requirements for cable protection. This information must be included in the ES.	This information was not defined at the time of writing and will be included in the ES.
NRW	Introduction: We advise that engagement with all relevant regulators, consultation bodies and stakeholders continues throughout the pre-application stage of the Project.	Acknowledged. Menter Mon has undertaken regular engagement thus far and will continue to do so.
NRW	Project Boundaries, Approach to EIA and Consenting Process: The ES for the Project must address all impacts for the installation, operation and decommissioning phases of the development. In doing so, it is important that attempts are made to quantify the significance of the impacts (e.g. expected extent and intensity) and any seasonal variations on impacts are identified based on site-specific environmental sensitivities. Minor or negligible impacts also need to be considered (albeit in less detail). The ES should identify management and mitigation measures to be used for each issue. It is also important to assess the residual impacts following implementation of the identified management and mitigation measures. Where there is established literature or case history this should be highlighted and referenced.	Acknowledged. Royal HaskoningDHV follows the IEMA guidelines on undertaking EIA and are IEMA certified EIA practitioners. Our approach to undertaking the EIA would look at impacts from all phases of the development as well as describing any appropriate mitigation or management measures appropriate.
NRW	Project Boundaries, Approach to EIA and Consenting Process: We support the Project Design Envelope (Rochdale Envelope) approach, however we highlight the importance of a clearly defined design envelope to allow the production of the ES. The worst case scenario for the Project Design Envelope for relevant receptors must be clearly identified and the Project Design must be clear so that it can be understood by the regulators and stakeholders. It should be noted that the realistic worst case scenario may change throughout the EIA process depending on the receptors being assessed. The project design envelope as currently defined within the scoping report, requires further refining to be fit for purpose for the EIA.	Acknowledged. The project description chapter will provide a detailed discussion of technologies to be included as well as construction methods potentially used. A greater level of detail on technologies to be included within envelope will be included within the ES.
NRW	Project Boundaries, Approach to EIA and Consenting Process: We welcome the acknowledgement that where a technology falls outside the consented envelope, a separate Marine Licence would be required for deployment at the Morlais Demonstration Zone.	Acknowledged.
NRW	Project Boundaries, Approach to EIA and Consenting Process: In defining the Project design envelope we recommend that you draw on good practice, such as the lessons learnt from the UK wave and tidal stream demonstration zone workshop in Cardiff, held on 14 and 15 July 2015.	Acknowledged.
NRW	Project Boundaries, Approach to EIA and Consenting Process:	Acknowledged. These sources will be fully utilised for the ES.

	"The Scoping report has not fully drawn upon information collated within The Crown Estate's plan level HRA for their 2013/2014 wave and tidal stream leasing round, or guidance and information provided by NRW Advisory. We recommend that the following sources are utilised for the EIA: >NRW advice on scoping Environmental Impact Assessments for wave and tidal stream demonstration zones and Protected sites. >NRW natural heritage checklist: tidal stream energy demonstration zone West of Holy Island, Anglesey. >NRW note on The Crown Estate's Habitats Regulations Appraisal of their 2013/2014 leasing round for wave and tidal stream energy."	
NRW	Project Description: In Section 4.3.2 Tidal energy converters such as Open Hydro devices are mounted on jacket foundations using pin piles. However, Table 4.1 explains that the Open Hydro device is deployed directly on the seabed using gravity foundations. This should be clarified and the appropriate impacts considered in the ES.	The Open Hydro device has been designed to be deployed on a gravity base, although, most jacket mounted tidal devices can be modified to take pin piles. Some require the installation of pin piles to reduce lateral motion underwater.
NRW	Project Description: Section 4.3.2 states that twin rotor floating device types may require up to four gravity anchors. The dimensions of any such gravity anchors should be stated.	The worst-case scenario for gravity base structures and associated catenary / anchor cable spread will be included in the ES and used to assess impacts such as scour, habitat loss and entanglement.
NRW	Project Description: The decommissioning stage of the Project must be included in the ES, including a full range of decommissioning techniques for the technologies that are deployed in the Zone.	Where available, specific decommissioning activities will be outlined; however, as decommissioning will take place in the future, methodologies may change from what is currently available.
NRW	Project Description: Section 4.4.1 states that the expected lifespan of the Project is 45 years. The EIA must provide clarification of whether this includes the decommissioning stage. If not, this will need to be added onto the Project timescales for a complete temporal assessment.	The consent for 45 years is the projects operational lifetime. Decommissioning is likely to be after the 45 year terms.
NRW	Project Description: We have been made aware that discussions between Menter Môn and NRW Advisory have indicated that renewable technologies deployed within the zone may not be limited to tidal current devices and that floating wind, or wave devices may also be considered. The project design envelope must be sufficient to cover all device types that are intended to utilise the Demonstration Zone, otherwise an additional marine licence, and EIA consideration will be required.	Acknowledged. The project design envelope will be sufficient to cover all anticipated devices.
NRW	Project Description: We welcome the inclusion of Section 4.3 (Overview of technology) and would expect a similar section in the final ES.	Acknowledged.
NRW	Project Description: We recommend liaison with the Port of Holyhead Harbour Master to ensure that an Oil Pollution Preparedness, Response and Cooperation (OPRC) Plan is drawn up for Project. The Port of Holyhead has an OPRC Plan to deal	Acknowledged.

	with spillages in the port area. Liaison with the Harbour Master may allow identification of areas for potential mutual assistance.	
NRW	Project Description: The scoping report has not addressed high voltage underground cables and whether they will contain cooling oil, or not. As the underground cables will be new it would be favourable if they did not contain coolant oil. If they must contain oil there should be a leak/pressure loss detection system built into the system.	The technology to be used in the underground cable report has not currently been confirmed. The project description and worst-case scenario parameters in the ES will provide details of potential cable technologies.
NRW	Project Description: The assessment of impacts must take account of all aspects of the project including ancillary components. These may include the cable landfall, access tracks, electrical connections (overhead lines or buried cables), construction compounds, sub-stations or other structures required by the scheme	Acknowledged. All components of the project will be defined within the project description and assessment.
NRW	Key Policy and Planning Legislation: Section 5.3.6 states that section 36 consent is required for the export cable. It should be noted that a section 36 consent only relates to the generating station. This should be stated correctly in the application.	Acknowledged.
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NRW	Key Policy and Planning Legislation: Section 5.3.4 and 5.3.8 - All components of the Project below Mean High Water Springs will require a Marine Licence determined by NRW (not MMO) as the Project is entirely within Welsh inshore waters.	Acknowledged and updated in the scoping report.
NRW	Key Policy and Planning Legislation: Section 5.3.4 – states 'the protection and maintenance of MCZs will be enforced by the MMO' Please note that this only applies in English waters.	Acknowledged.
NRW	Key Policy and Planning Legislation: Section 5.3.5 - As clarified by NRW previously, this scoping opinion has been provided by Natural Resources Wales under The Marine Works (Environmental Impact Assessment) Regulations 2007, and by the MMO under the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000 (as amended). The EIA should ensure that the role of NRW and the MMO in relation to this Project are correctly defined.	Acknowledged.
NRW	Key Policy and Planning Legislation: "The EIA must consider the implication of the Project on the following European Directives: >EC Habitats Directive (protected sites and species measures). A shadow Habitats Regulations Assessment (HRA) or information to inform an HRA document should be provided with the ES. Further details on the requirements of the HRA are provided in Section 7.1 and information about EPS licencing is provided in Annex 2 of this Scoping Opinion.	Acknowledged. Information required to inform an HRA will be provided, the ES will provide full details of protected sites, potential pathways and identify potential impacts. This information will be used to provide information sufficient to support regulators undertaking an HRA.

	>Marine Strategy Framework Directive >Water Framework Directive. A Water Framework Directive compliance assessment should be supplied with the ES. The Requirements of national legislation must also be considered, including: >The Wildlife and Countryside Act (1981), as amended by the Countryside and Rights of Way Act (2000). >The Natural Environment and Rural Communities Act (2006) >The Conservation of Habitats and Species Regulations 2010 (as amended)."	
NRW	Metocean conditions and coastal processes: The scoping report lacks sufficient detail with respect to the coastal processes topic to assess whether the proposed scope is adequate. For example, no detailed information is provided on available baseline data and proposed surveys and there is no detail with respect to modelling proposals. In order to ensure that data collected is fit for purpose, models used are accurate, well calibrated and validated we would urge the applicant to consult with all relevant consultation bodies on the scope of data collection and analysis.	Little data on metocean conditions on the site was found during the literature review. A more detailed study would need to be undertaken to determine baseline conditions on site. Physical processes is one of the research streams being pursued by SEACAMS and outputs to feed into the EIA are anticipated. It should also be noted that, based on current data, much of the site is anticipated as being hard substrata, or hard substrata with a thing sediment veneer. Near field physical process impacts may therefore be limited. Royal HaskoningDHV would propose taking a conceptual model approach to informing the EIA in this area. Such a non-numerical approach has proven effective in supporting applications at a number of tidal energy sites to date (PTEC, Skerries etc.)
NRW	Metocean conditions and coastal processes: No description or assessment of zone of influence/impact pathways was provided in the scoping report, therefore we are currently unable to confirm whether or not we agree with the zone of influence and impact pathways. This also presents implications for advice that can be provided in relation to designated sites, cumulative impacts and activities to be scoped out. Further detail is required in the ES.	Acknowledged. Justification for the zone of influence would be provided within the ES.
NRW	Metocean conditions and coastal processes: Cable protection is mentioned but limited information is provided in the scoping report. This must be appropriately assessed in the EIA.	Due to the level of information available at the time of writing it is not possible to provide further detail on the amount of cable protection expected to be required. Worst case scenarios for cable protection would be provided in the ES, based upon the agreed design (Rochdale) envelope.
NRW	Metocean conditions and coastal processes: Should any modelling by used to inform the EIA, full details of the validation and calibration must be included in the ES.	It should be noted that preference would be for a non-numerical, conceptual approach to any modelling works to support the EIA.
NRW	Marine sediment and water quality: The potential impacts on marine sediment are provided in Table 6.2 which we agree with, however, there is also potential for the release of contaminants into the water	Acknowledged. This would be fully assessed within the ES. Limited potential exists in the development site (limited sediment is present), but the

	column if marine sediment is disturbed. This should be assessed in the EIA.	cable route may have areas of contamination.
NRW	Geology, geomorphology, soils and hydrology: Section 6.2.1 describes the baseline for sediment quality. It is expected that contamination of sediment is unlikely, however this is based on a desk based review of potential sources and may not be an accurate reflection of the environment. Should the array require dredging, sampling will be required to determine the physical and chemical nature of the sediment. Depending on the scale of disturbance to install the array, sampling may be required and we would recommend early consultation to determine the sampling requirements.	Acknowledged. The presumption that contamination is unlikely given the nature of the site (limited, and coarse sediment), however, it is understood that validation of contamination may be required. This could potentially be tied into benthic or geophysical survey.
NRW	Geology, geomorphology, soils and hydrology: "The need for disposal of dredged material must be considered in the EIA (e.g. For the disposal of drill arisings). This should include: >Evaluate acceptability of potential adverse effects: >Consider alternative options and candidate disposal sites: >assess the need for a new disposal site. More detail can be found in the Cefas guidance 'Case Studies to Demonstrate the Selection of Dredged Material Disposal Sites at Sea Cefas'	The need for dredging will be fully discussed within the ES, where dredging or removal and disposal is required this will be fully considered, including the potential requirement for dredging and disposal licences. Note that drilling of foundations would be likely to use in situ, submerged drilling rigs, with no use of drilling lubricants, and drilling arising dispersed directly to seabed. This may require the classification of the development site for limited disposal.
NRW	Geology, geomorphology, soils and hydrology: In addition to the designated European bathing waters that are named in the reports, it should be noted that there is also a designated European Shellfish Water called Beddmanarch. This should be assessed in the EIA.	Acknowledged. Protected Shellfish Waters will be considered as part of the EIA. In particular, impacts of suspended sediment and associated contaminants would be considered.
NRW	Geology, geomorphology, soils and hydrology: The EIA must include an assessment of climate change scenarios.	Acknowledged. The impacts of climate change will be considered during the EIA for all potentially impacted receptors, in line with the amendments to the EIA Directive.
NRW	Natural Heritage Designated Sites: Proposed developments likely to significantly affect European Sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), either alone or in combination with other plans or Projects, require special consideration by the Competent Authority (typically the licensing authority) under Regulation 61 of the Habitats Regulations. As a matter of Government policy, the same applies to Ramsar sites.	Acknowledged, appropriate consideration will be given to the provision of data for the purposes of HRA. All European Sites, interest features and EPS with the potential to be impact would be identified and fully considered.
NRW	Natural Heritage Designated Sites: The HRA is a two-stage process, the first stage being a 'Test of Likely Significant Effect' to establish whether the proposals are likely to result in significant effects on any European sites (and Ramsar sites). If this establishes that significant effects are likely, or there is uncertainty whether significant effects are likely to result, then an appropriate assessment of the effects of the activity in view of the conservation objectives of the site(s) is required. The HRA also needs to consider in-combination effects of the proposed Project with other projects.	Acknowledged, information gathered during the EIA would be used to inform an HRA screening report that would identify which sites have the potential to receive Likely Significant Effects.

NRW	Natural Heritage Designated Sites: "The process of the consideration of development proposals likely to affect European Sites (and Ramsar sites) takes into account the conservation objectives of the site(s) concerned. It is undertaken by the Competent Authority, which in the case of the Marine Licence is NRW's Marine Licensing Team, and is an additional requirement to EIA. However, the information contained within the ES may be of relevance and be used in the HRA. We therefore recommend that the ES includes 'Information to inform the Habitats Regulations Assessment (HRA)'. Competent Authorities may only permit proposals that will adversely affect the integrity of European Sites (and Ramsar sites) if there are no alternative solutions, there are Imperative Reasons of Overriding Public Interest (IROPI) for the development and compensatory measures have been secured	Acknowledged. The information to inform the HRA would be included as an Appendix to the main ES document.
NRW	Natural Heritage Designated Sites: Without prejudice to the HRA or consenting process, a package of measures that would avoid or mitigate the effects of the proposed scheme and avoid adverse effects on the integrity of the European Sites (and Ramsar Sites), would appear challenging to achieve in this case. If this is the case it may be necessary to consider the scheme under Regulation 62 of the Habitats Regulations, where the possibility of alternatives to the Project that would not give rise to adverse effects on the integrity of the European Sites are considered.	The identification of mitigation is part of the EIA assessment process. Where significant impacts are identified, stakeholders would be consulted to try and identify and agree appropriate mitigation. It is presumptive to assume that there is no mitigation available to avoid likely significant effects prior to an assessment being undertaken.
NRW	Natural Heritage Designated Sites: The Crown Estate has produced a Technical Report, 'Wave and tidal enabling action: consolidation of wave and tidal EIA / HRA issues and research priorities (2014)', which may be a useful source of information for this EIA. This report identifies the key strategic EIA/HRA issues associated with wave and tidal stream arrays and identifies strategic research priorities which individual developers may plan to undertake or which could be addressed through a coordinated programme.	Acknowledged. This resource will be consulted in the preparation of HRA and EIA.
NRW	Natural Heritage Designated Sites: It is difficult to determine from the information provided in the scoping report the potential impacts and the significance of potential impacts, for protected sites. The EIA should concentrate on impacts both direct and indirect on marine and coastal sites and those adjacent to the cable route and any land-based infrastructure.	The EIA would seek to identify all potential impacts through informing the baseline and through consultation with stakeholders. Both direct and indirect impacts will be considered in the EIA.
NRW	Natural Heritage Designated Sites: Section 7.1 Natural Heritage Designated Sites, appears to have gone beyond the stated 50km area of search by including seabird SPAs as far as Pembrokeshire. We agree that these SPAs should be included as they are within the mean maximum foraging range of some of the classified features, especially gannet (640km) and Manx shearwater (400km).	Acknowledged. Foraging distances were our primary reason for including these SPAs.
NRW	Natural Heritage Designated Sites: Within Table 7.1 Habitats Directive sites in Ireland and also in other areas around the Irish Sea are not mentioned in the table. In view of the international nature of the Habitats	We would look at designated sites in Ireland which include species that may move through the site. It is assumed that this would relate mainly to SPAs on the Irish east coast.

	Directive, designated sites in other countries should also be considered.	
NRW	Natural Heritage Designated Sites: There are new Marine Protected Areas (MPAs) being considered that are of relevance to this Project. It should be noted that once the consultation on the proposed SACs and SPAs commences any such designations will become a material consideration in the decision-making process.	Acknowledged.
NRW	Natural Heritage Designated Sites: Certain species listed under Schedule 5 of the Wildlife and Countryside Act 1981 (WCA, 1981), as amended by the Countryside and Rights of Way Act 2000 (CROW, 2000) are legally protected from 'reckless or intentional disturbance. In addition, certain species listed in Annex IV(a) of the Habitats Directive and whose natural range includes any area in Great Britain are legally protected under the Conservation of Habitats and Species Regulations 2010 (as amended) (the 'Habitats Regulations') and Offshore Marine Conservation (Natural Habitats &c) Regulations 2010 (Offshore Marine Regulations). The Regulations prohibit the deliberate capture, injury, killing or disturbance of any wild animal of an EPS. The ES must consider the impact of the project on species protected under UK and European legislation, including those which are features of protected sites. Further information on protected species of particular relevance to the WADZ and guidance on the requirements of legislation can be found in NRW's 'Natural heritage checklist for the demonstration zone' and NRW Advisory's 'Advice on scoping an Environmental Impact Assessment for marine renewable energy developments'.	Acknowledged, see previous responses on HRA.
NRW	Natural Heritage Designated Sites: If the EIA identifies the presence of European or nationally protected species appropriate mitigation and/or compensation and reasonable avoidance measures must be proposed to ensure the Favourable Conservation Status of the species is maintained where necessary.	The use of mitigation and/or compensation will be considered during the EIA process.
NRW	Natural Heritage Designated Sites: Menter Môn may also wish to consider whether an EPS Licence under the Conservation of Habitats and Species Regulations 2010 will be required, as it is an offence to deliberately disturb capture, injure or kill or damage or destroy a breeding site or resting place of EPS. Further details on the EPS can be found in Annex 2 of this document. The need for EPS licence(s) should be determined as part of the EIA process	The potential need for EPS Licence was identified in Section 5.1. The need for specific EPS licence would be looked at in greater detail once more details of the project are known.
NRW	Natural Heritage Designated Sites: "Sites of Special Scientific Interest (SSSI), which are nationally important sites, notified under the Wildlife and Countryside Act,1981 (WCA) as amended by the Countryside and Rights of Way Act, 2000 (CRoW), which could be impacted by the project and therefore should be included in the ES include: >Rhosneigr Reefs SSSI; >Beddmanarach and the Cymyran SSSI; >Glannau Rhoscolyn SSSI; and >Ynys Feurig SSSI."	Interest features from these sites would be considered in the EIA.

NRW	Natural Heritage Designated Sites: The largest guillemot colony in North Wales, namely Carreg y Llam SSSI has been omitted from the list of protected sites. This SSSI with its notified feature of breeding guillemot should be added for consideration.	The SSSI has been included within the scoping report.
NRW	Benthic Ecology: "The scoping report has identified the features of conservation importance that require assessment for potential impacts. It is important to note that an EIA should be an assessment of the potential impacts on all potential receptors and therefore we would expect the final ES to include such an assessment. Where receptors are scoped out, a full explanation and justification explaining the reasons they are not assessed in the ES should be provided."	Acknowledged. Site specific benthic data was not readily available at the time of writing and most of the literature found related to features of conservation interest. Full consideration would be given to all benthic interest features during the EIA. This has been identified as a data gap.
NRW	Benthic Ecology: The benthic ecology impacts should be assessed for intertidal and subtidal ecology and cover the different stages of development (e.g. Potential effects during construction; operation and decommissioning). Each of the individual impacts should be assessed against potential cumulative effects from other existing or planned developments.	See previous comments- the EIA will cover all phases of development; however, it is likely that decommissioning will be assumed to be the reverse of construction.
NRW	Benthic Ecology: The benthic ecology potential impacts table (Table 7.4) has omitted the potential affect associated with the installation of export cables. These include direct loss/alteration of habitat and potential smothering of adjacent habitats due to cable laying. This must be included in the ES.	The potential impacts table has been updated to include all phases of cable installation in the scoping report.
NRW	Benthic Ecology: The intertidal ecology section is very brief and has not referenced and included appropriate baseline intertidal habitat maps (e.g. CCW Phase 1 intertidal biotope layer). This information should be presented in a similar way to the subtidal section (Table 7.3). This must be assessed against the predicted landfall location and methodology.	Acknowledged. The CCW Phase 1 intertidal biotope layer will be used for the EIA and presented in the ES.
NRW	Benthic Ecology: The EIA baseline characterisation strategy (Section 7.2.3) must include an assessment of the intertidal habitats present in and around Penrhos Bay. This could include undertaking a re-assessment of the CCW Phase 1 intertidal habitat survey for the planned cable landfall site (Penrhos Bay) to an appropriate scale for the planned works to provide the baseline/characterisation for the intertidal zone at the cable landfall site location.	Acknowledged.
NRW	Benthic Ecology: Any nationally important marine habitats and/or species (UK BAP/Section 42) either under the footprint of the demonstration zone, cable route and landfall, or any habitats or species that may be indirectly affected by the planned development (i.e. within the zone of influence) need to be identified and included as part of the ES. These include *Musculus discors* beds (two records to the North of Holyhead from 1996), seagrass (recent and historic records) in shallow water on the east and west sides of Holy Island (outside of the zone but potentially within the wider zone of impact) and fragile sponge and anthozoan communities both within and adjacent to the zone. BAP subtidal mixed muddy sediments,	Acknowledged. Further information on BAP will be provided within the ES.

	and BAP subtidal sands and gravels are also predicted to occur in and adjacent to the zone, along with patches of Annex 1 rocky reef (survey records and BGS hard substrate map). The BAP species *Arctica islandica* and *Haliclystus auricular* have also previously been found in shallow waters off Holy Island (MNCR records from 1996) and may occur within the zone. If none are present this should be stated.	
NRW	Benthic Ecology: A thorough biosecurity risk assessment must be undertaken as part of the EIA process. The adjacent Holyhead Marina contains the invasive carpet sea squirt *Didemnum vexillum*. This has not been mentioned in the scoping report and should be a major consideration with this Project. The EIA should consider how *D. vexillum* will be contained within the marina, and any measures detailing how onward spread of this species will be mitigated. This is particularly important if, during any stage of the development (construction, operation, decommissioning) the developer intends to use the facilities at Holyhead marina or port for berthing of vessels, materials or equipment.	It is recognised that a biosecurity assessment including an assessment of alien species would be done in the EIA. However, we would like to also note that Holyhead Marina is a publicly used harbour and biosecurity of the harbour being at risk from non-development vessels would fall outside the scope of the EIA.
NRW	Benthic Ecology: "With regards to section 7.2.3 (EIA baseline characterisation strategy points), the need for new data collection should depend on the quality and timeliness of existing material. If new data collection is required, the following guidance for benthic sampling should be utilised as it is best practice for Projects of this nature; >Ware, S.J. & Kenny, A.J. 2011. Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites (2nd Edition). Marine Aggregate Levy Sustainability Fund, 80pp."	Acknowledged. Careful consideration would be given to the availability of data, including those collected by SEACAMS.
NRW	We welcome the approach to confirm the presence of biotopes in the ES by review of available survey data and ecological characterisation surveys.	Acknowledged.
NRW	Benthic Ecology: We agree with the potential impacts of the Project detailed in Table 7.4 and would expect these and in addition an assessment of potential scour on the benthic ecology of the area to be covered in the EIA.	Acknowledged.
NRW	Marine mammals, basking sharks and reptiles: Paragraph 2 under 'Mammals' states that there is potential for an area of the Irish Sea adjacent to the West Anglesey Demonstration Zone (WADZ) to be designated as a SAC for harbour porpoise. It should be noted that once the consultation on the SAC commences any such designations will become a material consideration in the decision-making process.	Information on this was not in the public domain at the time of writing and final boundaries had not been communicated. However, the North Anglesey Marine cSAC for harbour porpoise has been included in the scoping report for consideration going forward.
NRW	Marine mammals, basking sharks and reptiles: "The ES must include impacts during construction, operation (including maintenance) and decommissioning on marine mammals including the following species: >harbour porpoise; >common dolphin; >Risso's dolphin; >grey seal; >minke whale; and >bottlenose dolphin.	Agreed. All species recorded in the project area or adjacent area will be considered in the ES during all phases of development. It is anticipated that a separate EPS licence would be submitted for construction (depending on the parameters of construction methods).

	Some species present a higher risk than others, for example minke whale and common dolphin, however the potential for collision risk needs to be considered for all species due to possible EPS offence issues (see Annex 2)."	
NRW	Marine mammals, basking sharks and reptiles: The spatial extent of the EIA should be guided by the relevant marine mammal management units. Broad receptor groups have been mentioned in the scoping report but impact pathways have not. The ES must include receptor groups and impact pathways, and the same pathways identified in the ES should be considered in the Cumulative Impact Assessment.	Impact pathways will be identified within the ES and marine mammals will be assessed in reference to the relevant marine mammal management units (which are species specific). Cumulative impacts from other developments within MMMU would also be considered as part of the EIA.
NRW	Marine mammals, basking sharks and reptiles: The nearshore and inshore waters of the Anglesey coast are important for cetaceans. Of the several species of cetacean present the most notable are the harbour porpoise and bottlenose dolphin listed in Schedule 5 of the WCA 1981, and under Article 12 of the Habitats Directive. The coast and inshore waters of Anglesey are also important for grey seals which breed and haul out on undisturbed sections of the coast and which feed extensively within the nearshore and inshore waters. The use of the Zone and surrounding area by marine mammals must be assessed both spatially and temporally in the EIA.	Acknowledged. Further information is needed to determine the importance of the site for marine mammals. This information will be used to inform the EIA, as stated in the EIA baseline characterisation.
NRW	Marine mammals, basking sharks and reptiles: Bottlenose dolphin and grey seal are both features of SACs which are 'within range' of the WADZ (see NRW Advisory's Natural heritage checklist' for further details). The possible effects on these species features will need to be part of the consideration of the likely significantly effects of the WADZ on European sites (SAC, SPA), both alone and in combination with other plans or Projects, required under Regulation 61 of the Habitats Regulations.	Acknowledged. Marine mammals from SACs within range of the site will be considered. Further information will be gathered to ascertain whether mammals from other areas use or pass through the Morlais site and connectivity/foraging impacts will be assessed.
NRW	Marine mammals, basking sharks and reptiles: Key issues that must be considered in the EIA are displacement and collision during operation and noise impacts during construction, operation and decommissioning. Indirect effects on prey species and cumulative effects should also be considered.	Acknowledged. Displacement and collision both during operation and construction (and decommissioning) will be considered. Indirect impacts on prey species (fish) would largely be covered in fish assessments but fully assessed in terms of the impact that this would have on bottle nosed dolphin.
NRW	Marine mammals, basking sharks and reptiles: The potential for population level effects on marine mammals will need to be considered where significant impact pathways have been identified. Modelling frameworks such as the Population Consequences of Disturbance (PCoD) or tolls such as Potential Biological Removal should be considered.	Acknowledged. Our marine mammal experts are highly familiar with these framework models and assess population impacts as standard. We have done these studies for other wave and tidal projects.
NRW	Marine mammals, basking sharks and reptiles: Table 7.5 gives little consideration to entanglement. We advise that you consider Scottish Natural Heritage's (SNH) publication: "Understanding the potential for marine megafauna entanglement risk from renewable marine energy developments" for guidance.	Many tidal developers design their equipment to reduce the risk of entanglement. Entanglement will be considered alongside other impacts such as collision and displacement.
NRW	Marine mammals, basking sharks and reptiles: Section 7.3.1: We question the statement made here (last paragraph) that Anglesey has no breeding population of grey	Local pupping sites are mentioned, but several sources have referred to small numbers of individuals pupping in

	seals, given that local pupping sites are mentioned in Westcott and Stringell (2003), which is referenced at the foot of the same page.	isolated locations around the coast and not a specific breeding population. This will be clarified further in the baseline section of the ES and the relevant impacts assessed. Of particular importance will be impacts on seal pups from underwater noise (there is currently no data to suggest how sensitive they are) and collision/entanglement of young seals.
NRW	Marine mammals, basking sharks and reptiles: Section 7.3.5: EIA baseline characterisation strategy points: The need to gather new site-specific data through survey is likely to be greater than implied here, especially in light of likely designation of new SAC for harbour porpoise – unless recent historic records are found to provide a wealth of relevant material.	Acknowledged. Consultation with stakeholders to discuss the requirements for site specific field data will be very important, both to ensure that sufficient data is collected but also so that developer does not get burdened with undue costs of ground truthing data and furthering research used for designating SAC.
NRW	Fish and Shellfish Populations: Table 7.6 identified collision risk to migratory fish as a potential impact; however it does not mention collision risk to non-migratory fish. It is not clear whether or not this has been considered. We would suggest that this should be included in the ES, however if it has been considered and scoped out, justification must be provided.	It is acknowledged that collision of non-migratory species is a potential impact, more information is required for the baseline in order to scope in or out potential impacts.
NRW	Fish and Shellfish Populations: "Specific reference should be made to the potential impact pathways for fish species identified in Natural Resources Wales Natural Heritage Checklist: Tidal Stream Energy Demonstration Zone West of Holy Island, Anglesey (2014). This includes sea lamprey, river lamprey and Allis shad which are Annex II fish species of the Pembrokeshire SAC. The EIA should assess the following impacts: > effects of Electromagnetic Fields (EMF); > effects of underwater noise; > barriers to migration routes: > collision risk with devices; > effects of habitat loss; and > indirect effects.	It is unlikely that sea and river lamprey in Pembroke will be within the MDZ. There is little information about the migratory routes of sea lamprey after leaving the river but information on river lamprey suggests very limited movements into adjacent coastal waters. Migratory fish would be fully considered in the ES and where species are not considered, a justification would be provided.
NRW	Fish and Shellfish Populations: A section should be included in the ES on transitional fish species (which would include bass, herring, whiting etc.) and a migratory fish section for lamprey, salmonids and eels.	Fish assessments typically look at seasonal variations, particularly in relation to spawning and larval activity. This would be looked at as part of the EIA.
NRW	Fish and Shellfish Populations: We recommend early engagement with all relevant consultation bodies to discuss the requirements for underwater noise data collection and assessment. This comment applies to all underwater noise receptors.	Acknowledged. We would also recommend this, to give plenty of time for discussion about collecting underwater noise data and agreement of appropriate approaches.
NRW	Ornithology: The proposed Project is in close proximity to important areas for marine life and birds. The application site is adjacent to, and within the foraging ranges of, sites nationally and internationally designated for their importance for birds, such as the Glannau Ynys Gybi / Holy Island Coast SPA, SAC	Acknowledged. Using available bird literature / data, as well as survey data gathered for the EIA, the assessment will seek to confirm the importance of the site to vulnerable species. In addition, we will seek to determine which species

	and SSSI; and Ynys Feurig, Cemlyn Bay and the Skerries SPA and SSSI	the site is used by and whether there are any parts of the site which have particular importance.
NRW	Ornithology: The scoping area for the EIA should be denoted by mean maximum foraging ranges (as identified in Thaxter et al (2012)) from SSSIs and SPAs. A map should be provided that shows the protected seabird features of sites that could potentially reach this area, based on their foraging ranges. This map should show protected sites (SPAs and SSSIs) with signposting to a table that lists, 1) the site, 2) the qualifying features and 3) the mean maximum foraging distance to the WADZ.	Acknowledged. Foraging ranges for species recorded in the site would be used to inform both the EIA and the HRA screening processes. The table is a reasonable suggestion and could be easily provided as part of the ornithology assessment.
NRW	Ornithology: The EIA should consider the potential for displacement of food sources from the area in addition to displacement of birds themselves. It has been noted how piling of turbines could lead to a reduction of clupeid sp. spawning grounds (Perrow et al, 2011).	Note that the use of percussion piling is highly unlikely at the site. We would also reference against Perrow, but typically it is understood that noise generated by percussive piling may temporarily disturb herring and reduce their spawning ground through displacement. However, unless the site is directly on spawning grounds there would be no permanent (or physical) reduction in spawning grounds from piling. This may lead to temporary impacts on those bird species dependent on herring, such as increased foraging distance or a reduction in food supply. This will be fully considered in the EIA.
NRW	Ornithology: The EIA should include assessment of the potential for birds to collide with structures that are lit at night	Agreed. However, the scale and number of surface piercing devices will be minimal and most (currently proposed devices) will be low in height. The risk is anticipated as being very low.
NRW	Ornithology: Given experience at other offshore sites, it is unlikely that coastal survey work will provide useful data to inform the EIA. We consider that the use of boat based surveys would enable true densities of seabirds to be ascertained to enable accurate predictions of impact to satisfy the requirements of both EIA and HRA. We would recommend consultation with all relevant bodies to discuss the need for and scope of any additional ornithological data gathering before work commences.	We would query this. Experience from other tidal sites, where vantage point survey results were validated by boat based surveys, have showed this to be an effective way of gathering data in some circumstances. It is acknowledged that some of the site is considerable distance from shore and some areas may not be suitable for vantage point survey. Potentially a greater level of survey effort with increased effort could be possible, with VP surveys' advantages in cost and deployment ease against boat surveys. We have local connections with a firm in the Wirral with a lot of experience in both marine mammal and ornithology surveys along the North Welsh coast (Rhyl Flats, North Hoyle and GYM).
NRW	Ornithology: In the first row of Potential Impacts Table 7.8, we consider that there is also potential for birds to impact structures in	It would be expected that there would be fewer birds in flight during stormy conditions. Collision of birds with structures will be assessed in the

	normal flight at night or (especially) in strong winds/ storms. This potential impact should be included in the EA.	ornithology section but it should be noted that the extent and height of surface piercing devices will be considerably less than that for offshore wind.
NRW	Ornithology: "Key areas of concern for ornithology which must be assessed in the EIA include: >Collision risk between diving birds and moving parts of the device. This also applies to fish and marine mammals. > Disturbance/Habitat Exclusion/Displacement: The development proposal may exclude birds, fish and marine mammals through producing noise, creating a physical or perceptual barrier, resulting in avoidance, and consequent exclusion from food resources. > Sedimentary Processes and Pollution: The devices may cause an increase in turbidity, associated with alterations of sedimentation patterns and therefore potentially an increased collision risk. There is also a potential risk of toxic compounds being leached from antifouling paints, hydraulic, or lubricating fluids. Seabirds and other marine wildlife are sensitive to contamination by oil-based compounds. Indirect impacts: to birds, fish and marine mammals due to habitat loss for prey, depletion, displacement or aggregation of prey. > The above possible adverse impacts may be applied to a range of birds (including the seabird features of SSSIs and SPAs), both breeding and non-breeding populations. Impacts may occur during installation, operation, decommissioning and routine maintenance operations."	Acknowledged. All these impacts would be assessed as part of the ornithology assessment.
NRW	Ornithology: "Terrestrial impacts: The land based works including the landfall of cables may have a possible adverse impact on birds and habitats. For example, the possible impacts to the chough population of the Glannau Ynys Gybi / Holy Island Coast SPA, could include disturbance and displacement of breeding and foraging birds. The local chough population is also subject to possible adverse impacts from other development proposals along the north coast of Anglesey, including the decommissioning of Wylfa Power Station, Wylfa B, the Deep Green Project and LNG Amlwch. Thus, cumulative effects on chough must be considered and addressed. Chough is listed within: >Annex 1 of the European Council Directive on the Conservation of Wild Birds (79/409/EEC), known as the 'Birds Directive'. Article 4 (1) of this Directive states that "species mentioned in Annex 1 shall be subject to special conservation measures concerning their habitats in order to ensure their survival and reproduction in their area of distribution". Article 4 (4) of this Directive states that, outside protected areas "Member States shall strive to avoid pollution or deterioration of habitats" for listed species. The Conservation (Natural Habitats, &c.) Regulations 1994 transpose this Council Directive into national law. > Schedule 1 of the WCA, 1981 (as amended), which means it is specially protected at all times of the year (and not just within the breeding season). > Johnstone, I., Young, A. and Thorpe, R.I. (2010). The revised population status of birds in Wales. Birds in Wales	Further information is required to determine the importance of the proposed onshore site to birds. Currently the location of onshore infrastructure is going through design/location work, a better assessment of impacts will be possible details on onshore locations have been refined. Cumulative impacts would be assessed as a standard approach to the EIA and it is noted that impacts to Chough need to be fully considered. "

	7(1): 39-91., as 'Amber' because it is a species of European Conservation Concern. > Natural Environment and Rural Communities Act 2006 as a species of 'principal importance for the conservation of biodiversity'"	
NRW	Ornithology: The potential impact of this development, both alone and in combination with other plans and Projects (including further phases of this development), upon populations of birds should be appropriately addressed. This may require bird surveys, including terrestrial bird surveys. The RSPB can also provide relevant terrestrial bird data for the general vicinity, including chough data.	Data requirements for gathering sufficient data would be best discussed with stakeholders to ensure that survey scope is suitable.
NRW	Ornithology: "Ornithological surveys should follow the guidance set out in 'Guidance on Survey and Monitoring in Relation to Marine Renewables Deployments in: Scotland Volume 4: Birds (Scottish Natural Heritage, 2011)'. Boat based surveys (or aerial surveys) will be required owing to the distance of the development site from the shore. It is important to identify the extent of the offshore site and provide a defined site boundary and appropriate buffer. RSPB research into potential effects of wave and tidal stream devices on birds recommends that, due to the paucity of systematic data, the longevity of birds, inter-annual and weather dependant variations, at least two years of pre-application data are collected, covering all seasons and including both breeding and non-breeding populations."	RHDHV developed the guidance quoted. The scope of survey requirements will need to be consulted with stakeholders to ensure data gathered will be acceptable and appropriate, but not excessive in terms of cost and effort.
NRW	Ornithology: We recommend early engagement with all of those organisations with an interest in ornithology to gain advice on survey methods.	Agree, see earlier comment.
NRW	Ornithology: "There is potential not only to mitigate for the adverse impacts of the development, but also to enhance the biodiversity of the development site and its vicinity. This should be addressed in the ES. Mitigation/enhancement measures if required could include: a. Time-related restrictions on construction, in relation to nesting periods. b. The use of sympathetic land management"	Where significant impacts are predicted, mitigation will be identified through the EIA process. Consultation would be undertaken to determine the most effective and appropriate mitigation techniques based on the impacts identified and the species impacted.
NRW	Terrestrial and Coastal Ecology: The EIA should take into consideration any potential impacts of onshore development associated with the Morlais Demo zone. The EIA should include appropriate ecological surveys to assess the likely impact of the scheme on protected sites and/or species.	Acknowledged. Once available data has been thoroughly reviewed, it would be advisable to discuss with stakeholders where available data needs to be supplemented with field data.
NRW	Terrestrial and Coastal Ecology: The proposed development is approximately 950m away from the boundary of the Beddmanarch Cymyran SSSI. The EIA should give full consideration to the potential impacts the scheme may have on this designated site.	Acknowledged. The SSSI is for coastal habitats, ornithology interests, eel grass, marine biology, botany and physical characteristics. All of these features would be considered within the appropriate ES chapters.
NRW	Terrestrial and Coastal Ecology: There is a record of otter and great crested newts in the vicinity of the proposed development. Otters and great	Presume that this refers to the onshore cable route. Local biological records will be assessed during the EIA baseline.

	crested newts are protected under the WCA,1981 (as amended) and the Conservation of Habitats and Species Regulations (2010). The EIA should assess the scheme's potential impact on the maintenance of the otter population at a favourable conservation status.	GCN and otter survey may be required if it is identified that there are ponds or waterways within the footprint of the onshore infrastructure options.
NRW	Terrestrial and Coastal Ecology: EIA baseline characterisation strategy points: We agree with the proposal to gather existing and new data. We note that a large amount of relevant material has been gathered from recent survey work for other proposals/ cases in the area (particularly Lateral Power and Land and Lakes), if available would be useful to inform the baseline characterisation.	Yes, there are a few developments in the area that have gathered data which could be utilised, some of this was used to inform the scoping report. Additional sources would be collated and utilised to inform the EIA.
NRW	Terrestrial and Coastal Ecology: We have been made aware that common lizards are present in the area, although not EPS, reptiles have partial protection under the WCA, 1981, and should be covered in the EIA.	We would be interested to know where the common lizards were recorded so that the EIA and survey could be focused. An assessment (probably desk based) of land suitable for common lizard would be required, and if necessary, a reptile study could be undertaken. However, consultation with stakeholders on the necessity and scope for this would be recommended.
NRW	Seascape and Landscape: The scoping report is brief in setting out the proposal in the seascape and landscape context. It acknowledges the Llyn AONB statutory landscape designation and outlines the Seascape Character Area baseline context for the development proposal. We recommend that you utilise Regional Seascape Units and Local Seascape Units information. The latter includes a sensitivity assessment to tidal stream development. We recommend that additional advice is sought from NRW advisory in this matter.	Acknowledged. Given the sensitivity of the AONB and the proposal for surface piercing infrastructure, we would recommend consultation with stakeholders in relation to SLVIA to determine a realistic scope that utilises available data.
NRW	Seascape and Landscape: In regard to sensitive viewpoints – the AONB is referred to and distinctiveness of South Stack in particular. Sea views towards the Anglesey coastline as well as views of the sea from the coast are relevant to the assessment. In the case of the former, views from the Ireland to Holyhead Ferry contribute to an important gateway to Wales.	Acknowledged. See previous comment. Stakeholder consultation would be highly recommended given the sensitive nature of the site.
NRW	Seascape and Landscape: Section 8.2 land use and quality does not mention that part of Penrhos Beach and all of Penrhos Coast Park which lies within the Llyn AONB. The routing of the cable, construction disturbance, location of the substation and potential effects upon the visual amenity of visitors to this part of the AONB need to be considered within the scope of the EIA.	These would be considered within the EIA. Temporary disturbance during construction is usually a key consideration both for LVIA and tourism and recreation.
NRW	Seascape and Landscape: The list of developments included within the cumulative effects assessment appear to include the relevant consented, operational and in planning development within the vicinity but we recommend Anglesey County Council planning department and NRW MLT are contacted to provide definitive comment on this matter prior to submission of any application	Acknowledged. The list of developments would be updated during the writing of the ES so that the list is up to date at the time of writing. All consented and projects within the planning application system at the time of consenting would be considered. We would consider plans not included within the planning system to be outside of the scope of the assessment.

NRW	Commercial Fisheries: It is not clear whether or not impacts to crab fisheries have been considered. This should be included in the ES, or, if this has been scoped out justification should be provided.	Impacts on crab fisheries have not specifically been addressed at this point. Data on small local fishing vessels, particularly areas of fishing activity, can be difficult to ascertain prior to consultation with local fishermen/stakeholders. The importance of the site for local potters would be used to inform the EIA baseline.
NRW	Commercial Fisheries: FishMap Mon may provide useful information to inform this section of the EIA. The Fish Map Mon information was gathered to give a better understanding of the fishery around Anglesey and help manage, protect and help maintain a sustainable fishery, and protect fishermen's livelihoods in the area. http://fishmapmon.naturalresourceswales.gov.uk/	This data source will be used to inform the baseline of the EIA.
NRW	Shipping, Navigation and Marine Infrastructure: "The ES should supply detail on the possible impact on navigational issues for both Commercial and Recreational craft, with regards to: > collision risk; > navigational safety; > visual intrusion and noise; > risk management and emergency response; > marking and lighting of site and information to mariners; > effects on small craft navigational and communication equipment; and > the risk to drifting recreational craft in adverse weather or tidal conditions."	The ES would consider impacts on commercial and recreation vessels. Impacts on fishing vessels will be considered separately due to the nature of their activity in coastal areas (i.e. not just transiting through). In addition, separate consideration would be given for different types recreational vessel activity, i.e. yachting, jet ski, recreational fishing etc.
NRW	Shipping, Navigation and Marine Infrastructure: A Navigational Risk Assessment (NRA) must be submitted in accordance with MGN 371 (and 372), the MCA's Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations, and the MCA's Under Keel Clearance Policy paper. The NRA must include a completed MGN 371 checklist available from the MCA website.	Acknowledged. Royal HaskoningDHV does not have this capacity in house, however, we have excellent connections with external parties who we often use to do shipping and navigational assessments.
NRW	Shipping, Navigation and Marine Infrastructure: The NRA must include comprehensive vessel traffic analysis in accordance MGN 371 and assessment of the possible cumulative and in-combination effects on shipping routes and patterns.	Acknowledged. Information required for the NRA would be gathered for and included in the EIA.
NRW	Shipping, Navigation and Marine Infrastructure: The shipping and navigation study should include radar and manual observations in addition to AIS data to ensure vessels of less than 300gt are captured.	The scope of this survey should be refined through consultation with stakeholders. This approach is standard but level of data required would need to be determined.
NRW	Shipping, Navigation and Marine Infrastructure: If it is necessary for the cables to be protected by rock armour, concrete mattresses or similar protection which lies clear of the surrounding seabed, the impact on navigation and the requirement for appropriate risk mitigation measures must be assessed. The ES should pay particular attention to export cable routes and burial depth for which a Burial Protection Index study should be completed and, subject to the traffic volumes, an anchor penetration study may be	Risks to vessels from cable protection (collision/anchoring) would be considered within the ES and the NRA. Under MCA guidelines, cable protection must not reduce the navigable depth by more than 5%, which may present difficulties if cable protection required within the harbour entrance channel. This level of detail would need to be

	necessary. Due cognisance needs to address cable burial and protection, particularly close to shore where impacts on navigable water depth may become significant. Any consented cable protection works must ensure existing and future safe navigation is not compromised. The MCA would accept a maximum of 5% reduction in surrounding depth referenced to Chart Datum.	determined through design engineering process.
NRW	Shipping, Navigation and Marine Infrastructure: The cumulative and in-combination effects require detailed consideration and the proximity of sites close to the development area will require a detailed assessment.	Acknowledged. See previous comments on cumulative and in combination impacts.
NRW	Shipping, Navigation and Marine Infrastructure: Casualty information from the Marine Accident Investigation Branch (MAIB) and RNLI would be a useful data source, in establishing the risk profile for the area.	Acknowledged. These sources will be fully utilised for the ES.
NRW	Shipping, Navigation and Marine Infrastructure: Any application for construction or operational safety zones will need to be carefully assessed and supported by evidence from the development and construction stages. For further detail on safety zones see the MMO's comments in Annex 1.	Acknowledged. Safety zones are implemented for the safety of all sea users and are a useful technique to minimise safety risk, however, when considering the use of safety zones, particularly during cable installation in areas of restricted navigation (harbour channel) sensitivity will be applied.
NRW	Shipping, Navigation and Marine Infrastructure: Particular consideration will need to be given in the ES to the implications of the site, size and location on SAR resources and Emergency Response Co-operation Plans (ERCOP).	These impacts would be fully considered within the ES. The level of surface piercing devices would be much less than that of an offshore wind farm so it is not anticipated that impacts on the radar or SAR would be of the same scale.
NRW	Shipping, Navigation and Marine Infrastructure: "The EIA should give consideration to how the Zone could be marked with marine aids to navigation in accordance with the general principles outlined in IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities) Recommendation O-139 on the Marking of Man-Made Offshore Structures as a risk mitigation measure. In addition to any permanent marking required, it should be borne in mind that additional aids to navigation such as buoys may be necessary to mitigate the risk posed to the mariner, particularly during the construction phase. All marine navigational marking, which will be required to be provided and thereafter maintained by the developer, must be agreed with Trinity House. This will include the necessity for the aids to navigation to meet the internationally recognised standards of availability. In the event that it is not possible to present the final definitive layout of tidal energy devices within the Zone in the Environmental Impact Assessment, then indicative layouts and marking should be considered for likely and "worst case" scenarios."	Lighting and marking will be based on advice from relevant stakeholders and guidance. Different technology types may need to be marked in different ways depending on their characteristics.
NRW	Shipping, Navigation and Marine Infrastructure: Any reference to IALA recommendations on the marking of wind farms should refer to O-139 Edition 1 December 2008 which replaced all previous versions.	Acknowledged. Latest guidance at the time of submission will be referenced.
NRW	Shipping, Navigation and Marine Infrastructure:	The placement of tidal devices is likely to be dependent on seabed and current

	"The following concerns have been raised by consultees in relation to navigation, which should be considered in the EIA: a) Trinity House has advised that an irregular arrangement of tidal energy devices is particularly difficult to satisfactorily mitigate the risk posed to the mariner in most cases. Therefore, every effort should be made to avoid having isolated tidal energy devices by achieving a regular shaped layout of tidal energy devices ideally with two clear lines of orientation. b) Laying of the cable may cause disruption to regular ferry traffic and other vessel in the vicinity of the Traffic Separation Scheme at the port entrance. c) Trinity House has advised that a Zone wide NRA will not be sufficient to adequately assess the impacts within the proposed site and NRAs will be required in addition from each individual developer, as the risks associated with the various types of device are likely to be different and as the site grows the cumulative risk will inevitably change."	characteristics. It may prove to be too restrictive to commit to regular arrangements across the entire site. Arrays could be installed in a regular pattern (linear/grid etc.) but to restrict the positioning of arrays themselves could be counterproductive and pose a risk for the project when seeking prospective clients.
NRW	Archaeology and Cultural Heritage: We recommend that Cadw, Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW), Gwynedd Archaeological Trust, Receiver of Wreck and UK Hydrographic Office are contacted to supply the most up-to-date information on which to base the EIA.	Acknowledged. These bodies will be contacted to determine the most appropriate sources of up to date information.
NRW	Archaeology and Cultural Heritage: Section 8.6.3 makes no reference to a Written Scheme of Investigation (WSI) to detail any necessary mitigation measures (e.g. development exclusion zones). We recommend that a WSI is undertaken and approval of the WSI and all of the programmes of archaeological work is gained from Gwynedd Archaeological Trust, RCAHMW and Cadw.	The production of a WSI is standard for works which have the potential to impact on archaeology and is applied post consent to manage potential impacts. The scoping report has been updated to include reference to a WSI.
NRW	Archaeology and Cultural Heritage: "We welcome the proposal to undertake additional historic environment studies and draw your attention to the following good practice guidance documents which we recommend are utilised for these studies: > Historic Environment Guidance for Wave and Tidal Energy https://historicengland.org.uk/images-books/publications/historic-environment-guidance-wave-tidal-energy/ > Historic Environment Guidance for the Offshore Renewable Energy Sector http://www.thecrownestate.co.uk/media/5876/km-ex-pc-historic-012007-historic-environment-guidance-for-the-offshore-renewable-energy-sector.pdf Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector http://www.thecrownestate.co.uk/media/5901/km-ex-pc-historic-012011-offshore-geotechnical-investigations-and-historic-environment-analysis-guidance-for-the-renewable-energy-sector.pdf > Marine Geophysics Data Acquisition, Processing and Interpretation: Guidance Note https://historicengland.org.uk/images-books/publications/marine-geophysics-data-acquisition-processing-interpretation/	Historical environmental studies for the sake of informing the EIA are standard; however, these normally constitute of desk based literature review, sometimes supplemented with archaeological assessment of geophysical samples, if collected. We note that the scoping report does not imply Menter Môn will undertake specific archaeological survey to inform the EIA.

	> COWRIE Guidance for the cumulative impacts on the historic environment from offshore renewable energy - available on request from enquiries@thecrownestate.co.uk > Model Clauses for Archaeological Written Schemes Investigation http://www.thecrownestate.co.uk/media/5514/model-clauses-for-archaeological-written-schemes-of-investigation.pdf > It is anticipated that the developer will appoint a heritage champion amongst its Project team and have a retained archaeological consultant who will provide a point of contact for implementing reporting best practice, as outlined in the Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) http://www.wessexarch.co.uk/projects/marine/tcerenewables/protocol-implementation-service > The Operational Guides provided by ORPAD give an introduction to ways in which historic environment assets can be protected through construction phases. It would be expected that this good practice would be adopted by the developer and all the developer's contractors. http://www.wessexarch.co.uk/projects/marine/tcerenewables/documents"	
NRW	Archaeology and Cultural Heritage: In 8.6.3, second bullet point 'review of subsurface historical interest features using existing bathymetric data and geophysical data' - we are aware of some limitations for archaeological purposes in the seabed mapping (multi-beam data) gathered by SEACAMS. We therefore draw your attention to specifications for marine geophysical surveys to assist with the identification of historic environment assets (e.g. side-scan and magnetometer) in the above guidance documents and recommend that you utilise these for future surveys. The involvement of an appropriately qualified maritime archaeological consultant in the design of these surveys will be critically important.	Acknowledged. It would be useful to discuss with NRW the limitations they have observed with the SEACAMS data as this data to fully understand your concerns. If SEACAMS data is not fit for use, this brings into question the approach taken during the SEACAMs work, as it limits the applicability of those data. Royal HaskoningDHV has highly experienced marine archaeologists within our expert staff, who would be able to design and manage any archaeology surveys required.
NRW	Archaeology and Cultural Heritage: As the proposed landfall for the transmission cable is to cross through a beach where there are recorded intertidal peat deposits, it is likely that a geotechnical assessment will be required for archaeological purposes. The involvement of an appropriately qualified maritime archaeological consultant in the developing the design of those survey, so that they best answer both historic environment and engineering purposes, will be critically important.	Acknowledged. It would be best to try to tie any archaeology surveys into requirements for engineering surveys. Specific geo-technical studies would be expensive and best avoided. Our lead marine archaeologist is highly experienced in both consultation and survey design.
NRW	Air Quality: The EIA should take into account roads and transport links that are likely to be used to transport construction materials and whether the potential change in traffic pollution will be significant. We would recommend continued consultation with all those bodies with an interest in air quality impacts is fit for purpose.	These would be included as standard. Consultation with local authorities is usually undertaken, particularly in relation to determining appropriate traffic management mitigation.
NRW	Air Quality: Protected Sites within 200m of the selected roads will need to be identified. The amount of NOx, SO2, dusts, nitrogen deposition that is likely to occur at the sites within 200m of the roads and whether this additional pollution is more than 1% of the relevant nutrient nitrogen critical loads, NOx &	Agreed, however, presumably it is the biological receptors that are of importance, i.e., potential impacts on tourists visiting historical attractions should be considered rather than the historical attributes themselves.

	SO2 critical level and dusts deposition for these sites, will need to be assessed in the EIA.	
NRW	Tourism and Recreation: This section of the ES should include sea-based recreational and sport activities.	Agreed, although there will be some cross over with the shipping and navigation and SLVIA sections.
NRW	Cumulative Impact and In-combination effects: Cumulative effects are likely to be significant in such a busy area and the EIA must address the implications that additional activities in the area will have on environmental resources e.g. bird displacement.	The assessment has not been undertaken therefore it is presumptive to determine significant effects are likely. Where they are identified appropriate mitigation will be identified either through industry best practice and/or consultation with stakeholders. Cumulative and in combination impacts for each receptor is probably best placed within receptor specific ES chapters.
NRW	Cumulative Impact and In-combination effects: Other Projects and activities in addition to those considered within section of the scoping report will need to be considered when assessing the cumulative impacts and in-combination effects of Morlais. Clearly identifying the key impact pathway / receptor combinations of relevance to Morlais, once the Project design envelope has been agreed will help to identify other activities which will need to be considered. It is important to note that for wide ranging marine species such as mammals or widely foraging seabirds, this may include Projects or activities located some distance from Morlais.	Acknowledged. See previous comments on cumulative and in combination impacts.
NRW	Cumulative Impact and In-combination effects: In-combination effects with other developments/proposals will also need to be assessed for HRA and WFD. These include Lateral Power and Wylfa Newydd nuclear power station.	Relevant data identified during the EIA will be used to inform HRA and WFD information.
NRW	Cumulative Impact and In-combination effects: "Section 10.1.3 – the types of Projects considered for cumulative impact assessment should include, in addition to those listed in the scoping report; > disposal of dredged material at Holyhead deep disposal site; and > cables and pipelines"	Acknowledged. All developments either consented or awaiting planning decision at the time of submission will be considered. Where developments are either scoped out or assessed as not resulting in significant impacts, pathways considered and justifications for the assessment result will be provided.
NRW	EIA Approach: Section 11.1 states “Baseline data collection to characterise the existing environment”. There is a need for clarity of terminology to make clear the distinction between baseline survey or data gathering and collation of data to inform the assessment of impacts within EIA. Data gathering including identifying those receptors which might be vulnerable to impacts is known as characterisation. Data gathering against which there will be impact monitoring, for example to validate predictions made in the EIA, is known as baseline data.	In this context baseline data refers to all data required to inform the baseline information section of the ES, which is then used to determine the impact assessment. This includes literature, available data and survey data gathering. The intention was not to overly commit to undertaking physical characterisation studies. We do not know the requirements of post consent monitoring yet, so all data used to inform the EIA could become baseline data in the context given by NRW.
NRW	EIA Approach: Identifying the key impact pathway / receptor combinations will help to focus any additional evidence or data collection to	Agreed. Stakeholder consultation to define scope and data gaps will be

	most effectively inform the assessment of impacts within the EIA process. We would encourage engagement and with all relevant stakeholders to discuss the need for and scope of any additional data gathering before work commences.	important in determining the level of detail required for approval of ES.
NRW	Proposed Methodology: It may be helpful to include outline notes on HRA proposals, if only to show how HRA – whilst using much of the same material - will be different, for clarity.	The HRA is a separate document, information presented in the ES would be used to inform the ES and it would be recommended that a section outlining HRA information should be included in the ES.
NRW	Proposed Methodology: The ES should detail any mitigation and monitoring as far as possible.	Receptor specific mitigation would be outlined in the relevant ES chapter. This could be summarised at the end of the report also. One approach to this is to also submit an outline CEMP which details all mitigation commitments made in the ES.
NRW	The Environmental Statement: The ES should be thoroughly proof read before submission to ensure that information such as protected site names and features of the sites are correct. Incorrect information or the omission of important information may result in incomplete assessments within the Environmental Statement. Omission of information regarding sites, features and protected species could cause delays should further information be required that has not been considered previously.	Acknowledged- this would be done as standard through multiple technical reviews.
NRW	The Environmental Statement: The EIA must be informed by best available evidence. This might include data gathering within the offshore scoping area, as well as experience from the consenting process for other test sites such as the Perpetuus Tidal Energy Centre (PTEC) off the Isle of Wight and the European Marine Energy Centre (EMEC) in Orkney.	Acknowledged- this would be done as standard through multiple technical reviews.