

Cay-Y-Mor license application - Method Statement

Version	Date	Description	Author(s)	Revised by
V1.0	10/04/2025	Draft	Beth Marshall Stevie Jarron	

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01 Introduction

Câr-Y-Môr are a Community Benefit Society based in Pembrokeshire, West Wales – Registered Company Number RS008172 as “For the love of the sea Limited”. Trading address – Upper Clegyr, St Davids, Pembrokeshire, SA62 6QN.

Câr-Y-Môr operate 2 neighbouring test aquaculture sites Carn Ar Wig (Fig 1) and Porthlysgi (Fig 3), which were originally licensed as trial seaweed and shellfish IMTA sites, both under Marine License DEML2013.

This license was granted by NRW to run from 01/08/2020 to 31/07/2025. Câr-Y-Môr intend to expand both these sites (Fig 2 and Fig 4). This documentation is designed to give Regulators confidence that appropriate consideration and where required mitigation to all factors concerning their expanded sites.

This License Re-application and associated documents contained and referred to in this submission provide critical information required for Natural Resources Wales (NRW) and other Statutory Consultees and Stakeholders to ensure consenting of the farm sites.

The attachment, “1 – Câr-Y-Môr Marine License Application Form” is the official application form for NRW. Future changes on any anchoring system changes (if any) will be detailed in communication to NRW and Crown Estate through the appropriate Attestation forms.

This document “2 – Câr-Y-Môr Re-license – Method Statement v1.0” details Câr-Y-Môr’s commitment to adhere to best practice when considering other users of the environment, both human and wildlife alike. This also contains a “Decommissioning Plan”.

Câr-Y-Môr’s commitment to wildlife and environmental preservation and wellbeing can be found in the attachment “3 – Câr-Y-Môr Re-license – Environmental Responsibilities v1.0”.

Navigational and marine safety can be found in the attachments “4.1 – Câr-Y-Môr Re-license – Carn Ar Wig – NRA MEAC Decom v1.0” and 4.2 – Câr-Y-Môr Re-license – Porthlysgi – NRA MEAC Decom v1.0”.

Visual Impact has been thoroughly consulted upon by the production of a Seascape Visual Impact Assessment for the Pembrokeshire Coast National Park Authority and is added in full in the attachment “5 – Câr-Y-Môr Re-license – Seascape Visual Impact Assessment v1.0”

Câr-Y-Môr’s commitment to wildlife and environmental preservation and wellbeing can be further assessed in the attachment “6 – Câr-Y-Môr license – Marine Mammal Entanglement Protocol”.

Câr-Y-Môr’s commitment to wildlife and environmental preservation and wellbeing can be further assessed in the attachment “7 – Câr-Y-Môr license – INNS Biosecurity RA and Management Plan”.

Consideration of the effects of this proposal on the marine ecosystem and Pembrokeshire Marine SAC can be found in the attachment “8 – Baseline Benthic Habitat Survey Report – v4 upload”.

Evidence of the consideration of the Welsh National Marine Plan can be found in the attachment “9 – Câr-Y-Môr license – welsh-national-marine-plan-signposting-en-only”.



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Letters of support from a variety of other marine users in the proposed plan area can be found in the attachment “10 - Car-Y-Mor license - Letters of Support”.

Additional information required for the Marine License Application Form can be found in both “Application Form Section 6c Additional Documents” and “Application Form Section 12a(i) Additional Documents”.



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01.01 Carn Ar Wig – existing site

The boundaries of the existing Marine License – DEML2013 for the Carn Ar Wig site are:

51.868074	-5.315736
51.867900	-5.315337
51.867141	-5.315830
51.867242	-5.316227

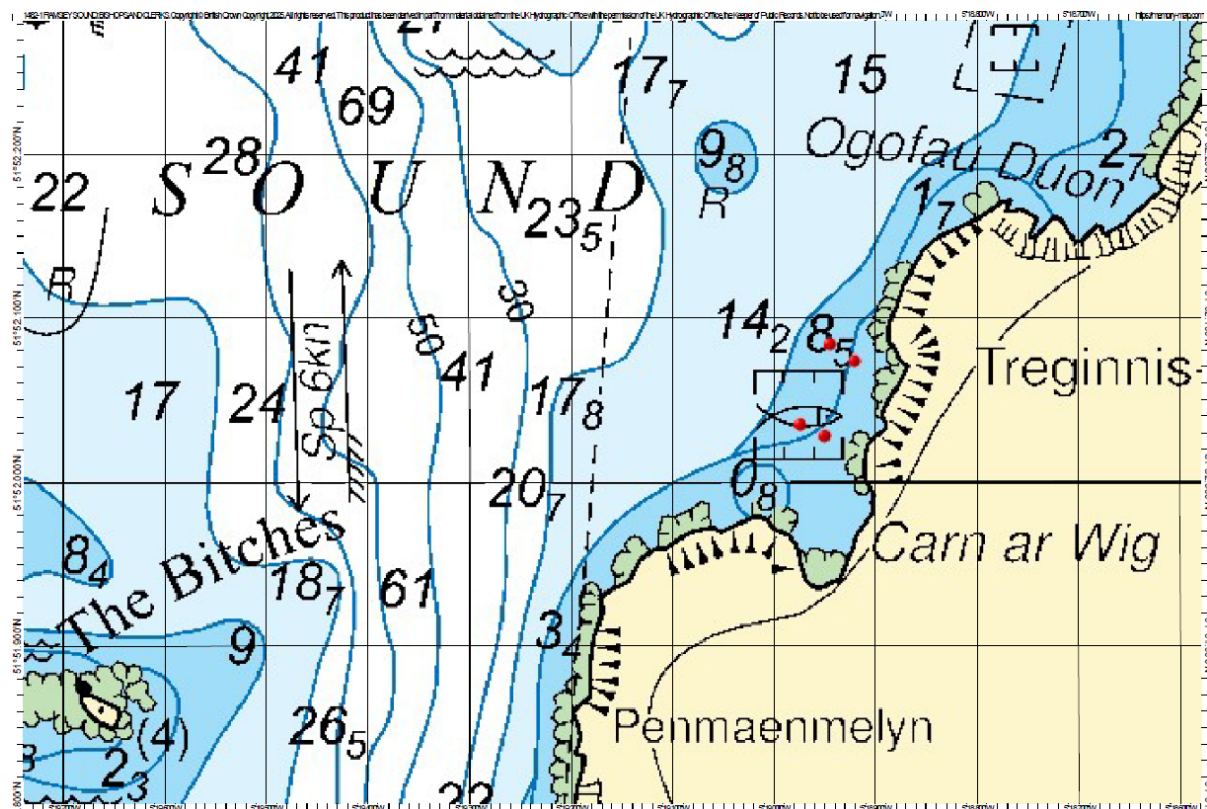


Fig 1 – Chart showing existing license site boundaries (red dots)

According to Current license DEML 2013, Carn Ar Wig site can hold a maximum of 20 floats and according to The Crown Estate License is for 1x 100m headline with seaweed seeded on 5m lengths of this headline and shellfish cultivating under the floats.

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01.02 Carn Ar Wig – expanded site

Câr-Y-Môr wish to expand the site at Carn Ar Wig to the boundaries laid out as:

51.8690	-5.3151
51.8674	-5.3160
51.8691	-5.3156
51.8677	-5.3171
51.8684	-5.3163
51.8682	-5.3155

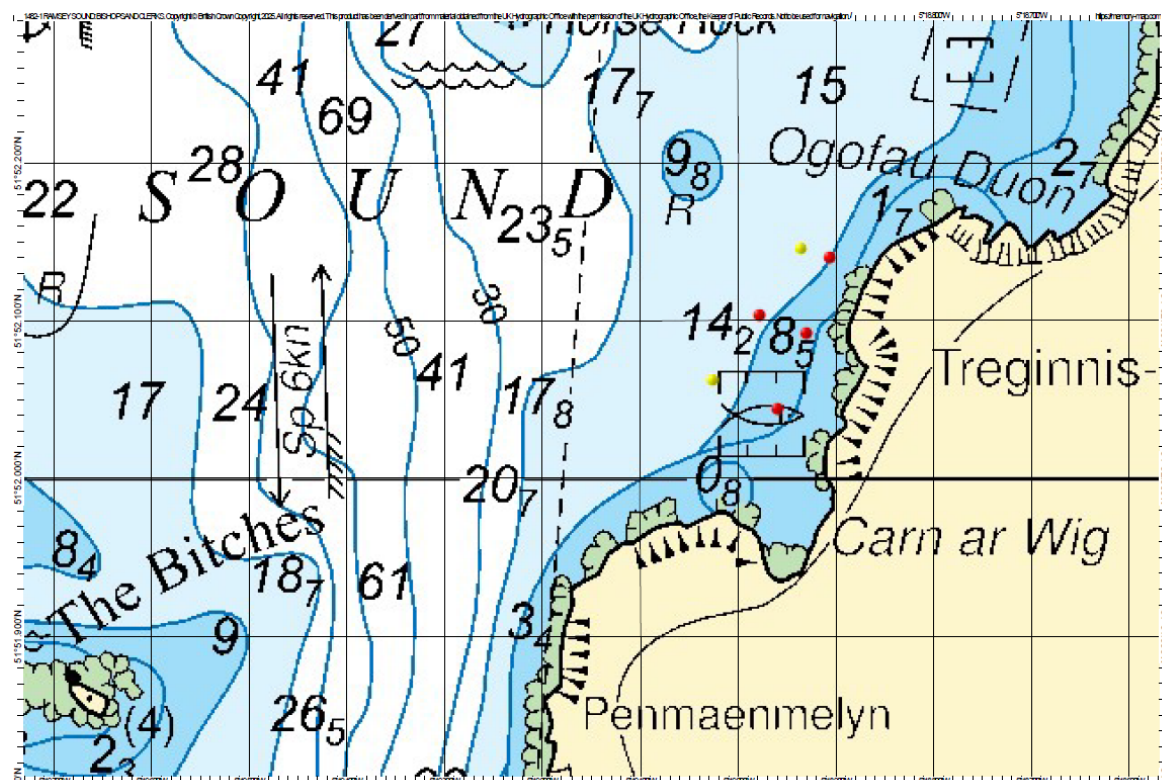


Fig 2 – expanded Carn Ar Wig boundaries (red dots), with special mark positions (yellow dots).

Câr-Y-Môr will deploy 2 x Special Marks as recommended for aquaculture sites, with colour scheme of yellow and flashing scheme of 1 yellow flash every 5s, visible from 2 nautical miles – Y Fl 5s (2m).

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Câr-Y-Môr intend to expand to a total of 4 longlines with 20m spacing between them and buoys every 7m along each line, and use for shellfish and seaweed cultivation (Fig 3).

The new site dimensions will be 200m long by 85m wide area totalling around 2Ha, with 4 mussel longlines spread 20m apart. Each line will have 220L mussel floats roughly 7m apart, totalling between 100-150 floats across the whole site. Each line will be attached at either end to anchors on the seabed and ground chain will attach the anchors to each other.

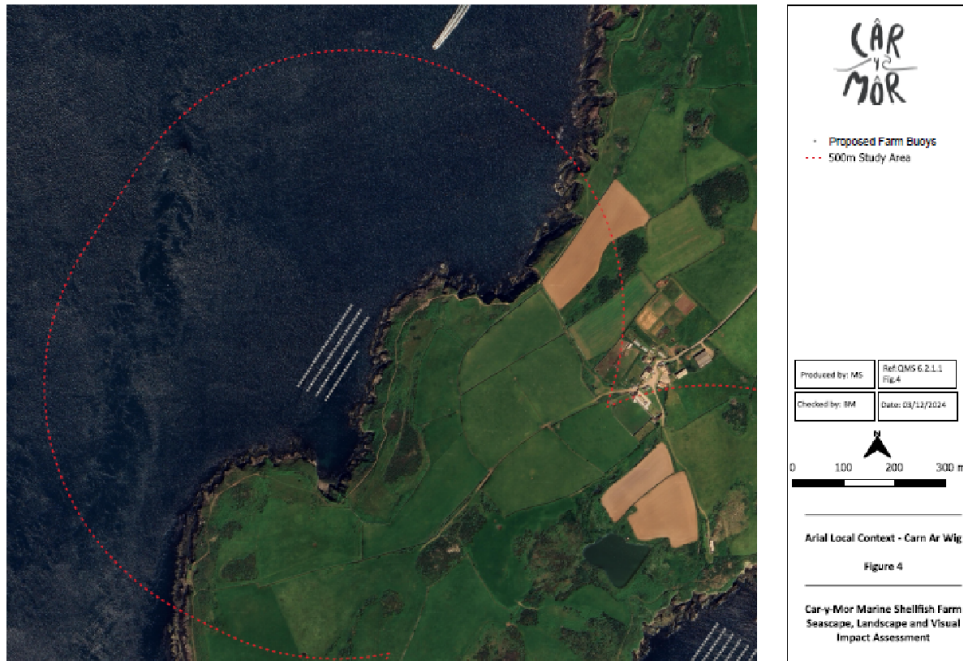


Fig 3 – New Carn Ar Wig aquaculture farm layout

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01.03 Porthlysgi – existing site

The boundaries of the existing Marine License – DEML2013 for the Porthlysgi site are:

51.863036	-5.304682
51.862895	-5.304309
51.862058	-5.304918
51.862199	-5.305277



Fig 3 – Chart showing existing license site boundaries at Porthlysgi (red dots)

According to Current license DEML 2013, Porthlysgi is for a maximum of 20 floats and according to The Crown Estate License is for 1x 100m headline with seaweed seeded on 5m lengths of this headline and shellfish cultivating under the floats.

01.04 Porthlysgi – expanded site

Câr-Y-Môr wish to expand the site at Porthlysgi to the boundaries laid out as:

51.8628	-5.3028
51.8602	-5.3055
51.8634	-5.3041
51.8607	-5.3069



Fig 4 – expanded Porthlysgi boundaries (red dots), with special mark positions (yellow dots).

Câr-Y-Môr will deploy 2 x Special Marks as recommended for aquaculture sites, with colour scheme of yellow and flashing scheme of 1 yellow flash every 5s, visible from 2 nautical miles – Y Fl 5s (2m).

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Câr-Y-Môr intend to expand to a total of 7 longlines with 18m spacing between them and buoys every 7m along each line, and use for shellfish and seaweed cultivation (Fig 4).

The new site dimensions will be 350m long by 110m wide area totalling around 3Ha, with 7 mussel longlines spread 18m apart. Each line will have 220L mussel floats roughly 7m apart, totalling between 320-450 floats across the whole site. Each line will be attached at either end to anchors on the seabed and ground chain will attach the anchors to each other.

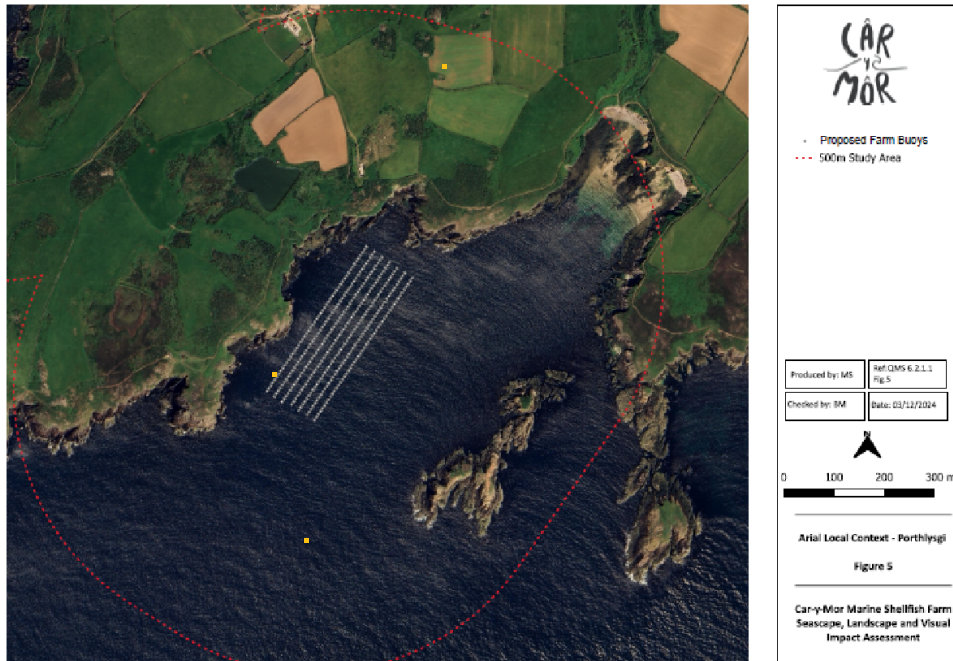


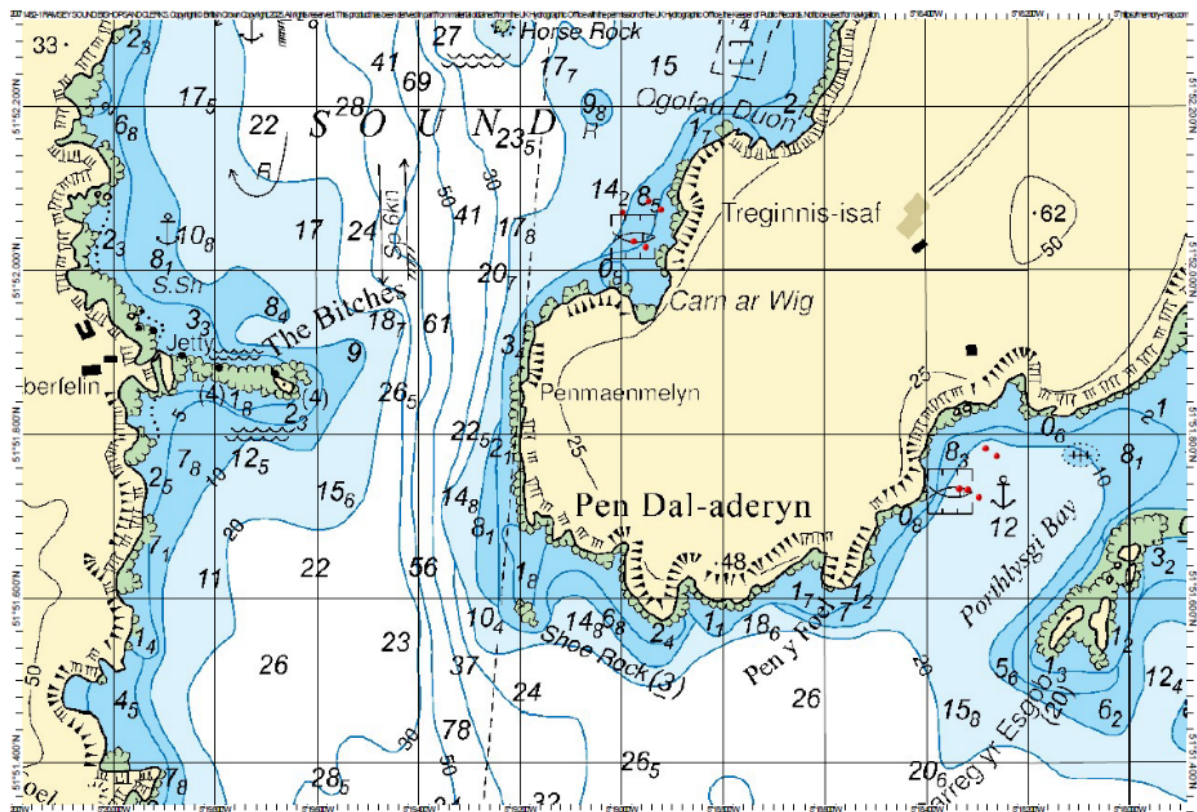
Fig 4 – New Porthlysgi aquaculture farm layout

02 Câr-Y-Môr – IMTA farm group

Câr-Y-Môr have used the waters of Ramsay Sound and the shores around the Pen Dal-aderyn peninsula for over 10 years for the hand harvesting of seaweed and the aquaculture of mussels and seaweed. Câr-Y-Môr have 2 licensed sea farms at Carn Ar Wig and Porthlysgi (Fig 5) using them as Integrated Multi-Trophic Aquaculture systems (IMTA) growing mussels and seaweed from 2019. Câr-Y-Môr have fully developed the 2 sites and have reached the capacity of the farming structures consented under license Marine License DEML2013. For continued success as a business and to relieve overcrowding of mussel growth at their sites, Câr-Y-Môr seek to re-apply for the IMTA licenses (due to expire by 31/07/2025) whilst also expand both sites to improve animal and crop husbandry and increase capacity to ensure business sustainability.

Câr-Y-Môr have invested in considerable equipment, currently in water and onshore for the growing and handling of seaweeds and mussels. Investment in buildings and equipment for the preparation of harvests for transport from site for further processing and marketing. Also the investment in time and training for the community based staff. Câr-Y-Môr are a pioneer in the development of the Welsh aquaculture industry.

Fig 5 – Câr-Y-Môr, showing both existing sites.



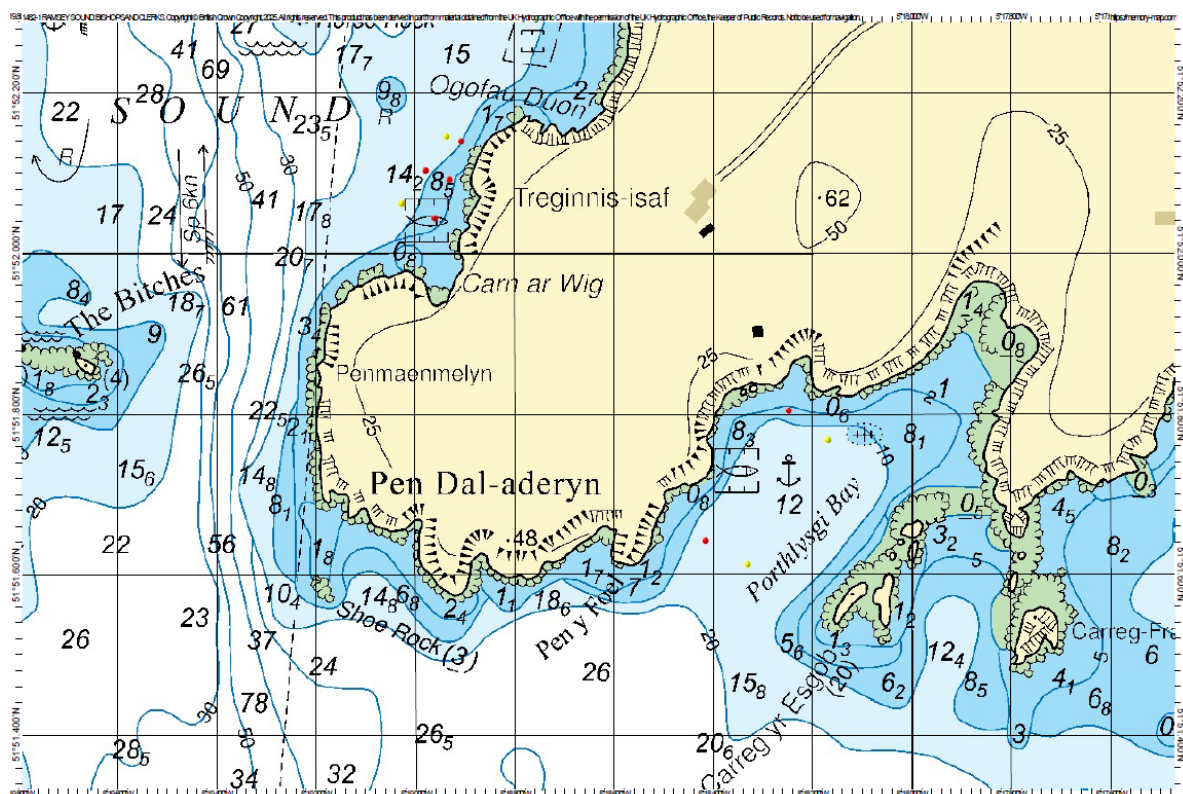
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Different trophic species will require a range of space and structure configurations to develop fully. For example:

- large brown kelps such as *Saccharina latissima* (sugar kelp) will grow up to 4m long in a season, on horizontal growing lines, spaced up to 4m apart.
- mussels require to be tended (regular husbandry to prevent predation by starfish etc), on long vertical droppers spaced 1m apart.

The expanded Câr-Y-Môr IMTA sites (Fig 6) have been purposely deployed in active waters for the growth of large brown kelps that require higher levels of agitation to grow clean, quality fronds and well flushed by strong tide flow perfect for the filter feeding shellfish.

Fig 6 – Câr-Y-Môr expanded sites consented area limits (red) and navigation markers (yellow).



Longlines and subsurface structures are made of high quality ropes as standard throughout the aquaculture industry and buoyancy is provided by heavy duty floats. The use of chains are limited to the minimum necessary to extend life of the structure and produce less rust pollution in the water (harmful to both shellfish, seaweeds and the wider ecosystem).

The existing and expanded IMTA farm structures have a low visual and environmental impact. We foresee no indication of risk to wildlife or other marine user interactions. The adapted structures and all farming activity will still be undertaken wholly within the licensed area boundary being applied for and all operations at the site(s) will be undertaken in daylight.

In summary - The Câr-Y-Môr IMTA sites have provided good seaweed and mussel growth in previous harvest years. They are located off the main fishing grounds; are not a detriment to sensitive wildlife habitats, create minimal visual impact to area; and are not a barrier to free movement of commercial or pleasure vessel traffic in and out of local harbours and anchorages.

03 Seaweed seeding and operations

Câr-Y-Môr intend to cultivate several native species of seaweed. At this time, the main seaweed cultivation species at the site will be, Sugar Kelp (*Saccharina latissima*) and Oar Weed (*Laminaria digitata*), with the potential to trial other large brown seaweeds, such as Atlantic wakame (*Alaria esculenta*) and Furbelows (*Saccorhiza polyschides*) to test for natural self-seeding of lines and for their chemical and nutrient content. All these large brown seaweeds or “kelps” are found naturally on lower littoral and sub-littoral rocks on the Pembrokeshire coast.

The Kelps have similar seeding seasons and scatter seeds into the water in late November through to early January. Fruiting bodies develop on varying parts of the seaweeds, near the base of the plants in the case of *Alaria*, or along the fronds in the other species. Fertile seeded stock will be collected from local shore sites and will be cultured onto growing medium at a commercial hatchery.

Dulse (*Palmaria palmata*) and Pepper Dulse (*Osmundea pinnatifida*) are valuable, small red seaweeds and Sea Lettuce (*Ulva lactuca*) is a valuable, small green seaweed that are native to the area. At the moment they are mostly hand harvested but the technology to cultivate them has been in development by commercial hatcheries. Câr-Y-Môr wish to include these species in the application in anticipation of viable technology to farm them being available imminently.

The volumes of seeding plants required to be collected will be very small, a standard bucket of fertile seaweed could nurture 20km worth of seeded farm growing line which could produce over 150 tonnes of mature seaweeds.

The process for seaweed farming is to wrap seaweed seed infused string (0.5mm) around growing lines (thin ropes 10mm to 12mm) which are deployed to mimic the seeding cycle of seaweeds in autumn and harvested in late spring before the natural biofouling of other sea organisms spoil the quality of the seaweed crop.

04 Shellfish seeding and operations

Câr-Y-Môr intend to cultivate the native shellfish blue lipped mussel (*Mytilus edulis*). This has been cultivated successfully at both farm sites for over 5 years and the need for expansion is critical for responsible animal husbandry. Other species such as the Native Oyster (*Ostrea edulis*) and Scallops (*Pecten maximus/Aequipecten opercularis*) are also included in this application.

Blue lipped mussel farming may clash with seaweed farming as the heavy spat from mussels may cover seaweeds and reduce crop and quality levels.

05 IMTA Line Deployment

The basic underlying structure of the Câr-Y-Môr IMTA farms are floating longlines. Longlines are double roped headlines supported by sturdy floats. They provide the surface structure and flotation for all activities at the farm sites.

Growing lines and formations are unique for the various species at the IMTA farm. For seaweeds, growing lines are strung out horizontally between the headlines, to maintain the optimum light and nutrient condition for the growing of seaweed. For blue lipped mussels, lines will hang vertically in the water column, collecting nutrient particles as they pass with the tides. There are no chemical additions or treatments used for these low trophic species growing processes and no feeds introduced to the water.

Regular and repeated plant and animal husbandry will be required to prevent the mussels being overwhelmed by predators such as starfish and sea urchins, and for the seaweed, to check on growth and quality to assure harvesting at maximum growth level versus acceptable biofouling levels.

During production cycles, samples of seaweed and shellfish will be taken and the quality tested. Periodic samples of shellfish will be collected for Environmental Health testing as per normal shellfish farming procedures.

06 Harvesting Process

The concept of IMTA is strongly focussed on a year round capability to harvest the multiple species grown at any one site. Any large brown kelps will be able to be harvested in April/May. Potential red seaweeds coppiced in May, July and September. Mussels will be dictated by the markets.

Automated seaweed harvesting machines are being developed which will use a simple frame with rollers and guides to channel seaweed past cutting heads. These will trim the usable frond of the plant into bins or boxes while leaving the rope and growing base (stipe and holdfast) of the plant intact. Red seaweed coppicing capability may be used to allow multiple harvests from these rapidly growing plants.

Automated mussel harvesting and riddling machines are available to Câr-Y-Môr and will be bought in as the operation scales up. But if the levels of mussel farming are to be kept low, then the processing may remain more manual.

07 Vessel use and operational cycle

To undertake the deployment and operational work at the aquaculture sites, Câr-Y-Môr will use their own self named “Car-Y-Mor” which is a versatile workboat, 10m x 4m. Speed, with a transit speed of <8 knots. This style of vessel will be used to install or move anchors and to tension the risers to give stability to the farms’ structures. The Car-Y-Mor vessel type is the primary workhorse for mussel and seaweed farm operations across the area. The vessel has a deck winch, crane and pot hauler cranes to deploy growing lines in the water and lift them again at harvest time. The decks will also contain harvesting machines and suitable containers for harvest and waste rope collected. They may be supported by a small aluminium tender used to support operations and bring people and equipment from the slip to the barge.



“Car-Y-Mor” work barge

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A second vessel “The Grafter” is a local workboat that is occasionally used as an additional work boat when needed, run by local skipper Steve Rees. Grafter is 8m x 4m, speed <8 knots. This style of vessel will be used to visit the sites to observe the structural integrity, whilst passing. They may occasionally take samples of harvest from the sites and support larger vessels. The vessel could possibly be chartered for deployment and operational phases.



“The Grafter” local workboat

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During any initial IMTA farms' structure development/replacement/maintenance phases, the work vessel Câr-Y-Môr will accurately reposition existing anchors or lay new anchor blocks on the seabed, as well as remove current farm infrastructure as it becomes obsolete. The vessel is generally anchored near the sites and so vessel movements are kept to a minimum. There should be a few days a year where anchors and structure work is done. Mostly this will be survey and maintenance work to ensure structures are in good order.

The surface floats and lines will be prepared ashore and can then be towed into place and the farm tensioned to hold the structure taught and in place. At all other parts of the operational cycle of the farms, the work vessel Câr-Y-Môr will be used.

Depending on which other species are grown at the IMTA farm will determine what level of vessel activity the sites will see, but it will be no more than 1 or 2 small vessel operations a week.

Vessels are required to visit the farm weekly to inspect the site to check on the structures (part of the license conditions) and the work vessel Câr-Y-Môr will use this time to check on crop growth and quality. A register of vessel movements and observations will be kept and available upon request from relevant authorities.

A full description of all activities at the farm sites including vessels and their timings of use, to consider the wider impacts on the environment, can be seen in Navigational and marine safety can be found in the attachments "4.1 – Câr-Y-Môr IMTA Re-application – Carn Ar Wig – NRA MEAC Decom v1.0" and 4.2 – Câr-Y-Môr IMTA Re-application – Porthlysgi – NRA MEAC Decom v1.0".



08 Onward Processing

To ensure the IMTA farm produce retains its quality it will be landed locally and loaded onto vehicles for onward delivery to be processed.

Drying is the main processing method used at this time for seaweeds, although Câr-Y-Môr anticipates that 90% of future material will be processed immediately as biostimulant once the biorefinery has been finished (anticipated end of 2025). Drying is currently done at low temperatures by way of hanging the blades in a polytunnel. This creates a stable, storable product that can be rehydrated as a future new ingredient. Câr-Y-Môr has invested heavily in a biorefinery, which will allow seaweed to be processed at low temperature into various products such as biostimulants and soil conditioners. This allows a less energy hungry type of processing, and therefore a lowered carbon footprint.

Shellfish have many local routes for further processing and distribution to a wide and well developed market.

09 IMTA Farm Further information

Marine aquaculture experts were consulted, who have extensive knowledge of licensing aquaculture sites. They have recommended that Special Marks be placed at the outer seaward extents of each of the farm structures. Câr-Y-Môr will ensure this is followed as equipment is deployed and recovered during operation phases. These are yellow-coloured floating buoys are marked by a top piece with a yellow St Andrews Cross. A solar powered light unit on each flash yellow at night. These allow local and visitor marine users to keep a safe distance from surface and submerged structures within the consented area. The light pattern is a conventional Yellow Flash every 5 seconds (Y Fl 5s).



10 Economic and Social Case for approval

Câr-Y-Môr are making a commitment to provide local employment; building on the talent and skillsets to be found in the Pembrokeshire area.

They envisage 6 full time equivalent (FTE) to manage the farming operations, with a further 4 to 6 people at busy times during line deployment and harvesting. These jobs are likely to be taken by local fishermen or members of the community already experienced in marine activities. The IMTA nature of the farm will also hopefully create more opportunities for sustainable employment in the area. Reversing the negative trend of economic emigration and an ageing demographic.

The Câr-Y-M processing and administration hub will increase its employment levels to meet the increased offtake volume from the enlarged farm sites. Up to 6 FTE staff will process seaweed and mussels as the farming operations grow. There may be overlap between staff that work at the sea farms and at the Hub, providing year round as well as seasonal opportunities for local residents.

11 Decommissioning Plan

Câr-Y-Môr have in place a Lease with Crown Estate for their existing IMTA farm sites and will update their leases when granted these expanded site licenses.

Part of that agreement includes the financial arrangements agreed between Câr-Y-Môr and Crown Estate on a 'Site Decommissioning Plan' in the event that Câr-Y-Môr choose to relinquish the site, or in the event that Crown Estate revoke their Lease, or where Câr-Y-Môr become insolvent.

Câr-Y-Môr propose to mirror this arrangement with NRW as part of the Re-licensing process; as with the conditions of receiving the TCE Lease; Câr-Y-Môr will ensure it retains sufficient funds to decommission the IMTA farm in proportion to the number of farm units installed.

Câr-Y-Môr agree to use local vessels, where possible, to remove all surface structures. These are light floats and longlines and would not require specialist vessels. Materials removed would be stored or disposed of ashore once all waste and environmental conditions have been complied with.

Subsurface anchors would be lifted by a chartered specialist vessel. Costs would be borne by Câr-Y-Môr to mobilise suitable vessels to site, lift risers and recover anchors. Navigation marks, risers and anchors would be removed from site. Materials removed would be stored or disposed of ashore once all waste and environmental conditions have been complied with.