

AnC Re-application – Navigational Risk Assessment & MEAC

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V3.0	19/09/2024	Final	Stevie Jarron	

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01 Introduction

Samudra Oceans Limited (Samudra) is a UK company (14470952), registered office - Shoreditch Exchange, Senna Building, Gorsuch Place, London, United Kingdom, E2 8JF. Argyll Aquaculture, who were authors of the original license have been asked to act as Agent for Samudra and write this Re-Application.

Samudra have acquired the Crown Estate Scotland Lease and taken ownership of the Marine Directorate license and the rights and responsibilities for the equipment for the Aird na Cuile seaweed cultivation Farm. A new MD license – 00010788 was issued to Samudra on 27/06/2024. This site was formerly owned by New Wave Foods under MS license - 06704/18/01. The existing MD license is due to expire on 01/10/2024.

The outer boundaries of the existing licensed area of Algal Farm site are laid out as:

56° 22.250' N	5° 32.000' W
56° 22.250' N	5° 32.200' W
56° 21.850' N	5° 32.600' W
56° 21.700' N	5° 32.750' W
56° 21.400' N	5° 32.650' W
56° 21.350' N	5° 32.200' W
56° 21.750' N	5° 32.200' W

Samudra wish to provide all marine users with the information to ensure safe passage past the farm site. This document provides information on the farm position in relation to other users, lighting arrangements and the structure of the farm itself. The 3 Special Marks as recommended by Northern Lighthouse Board in the original application process, are Y Fl 5s (2m) and laid out in the existing license at points:

56° 22.250' N	5° 32.200' W
56° 21.700' N	5° 32.750' W
56° 21.400' N	5° 32.650' W

The last section of this document is the Marine Emergency Action Card (MEAC) that will be given to Northern Lighthouse Board (NLB), Marine and Coastguard Agency (MCGA) and other marine users in the area before the farm is deployed. Samudra will also inform the Hydrographic Office of the positions and types of navigation buoys, as agreed by NLB and MCGA, at the site, prior to commencement of any deployment of equipment.



02 Vessel Traffic Review

A desktop study was undertaken to assess the Navigational Risks to vessels in the area of the existing Seaweed Farm. Using Marine Traffic tracking software, it was possible to provide Density Maps for 2021 (Fig 1) and 2022 (Fig 2).



Fig 1 - AIS 2021 Density Map – centre dot is farm site

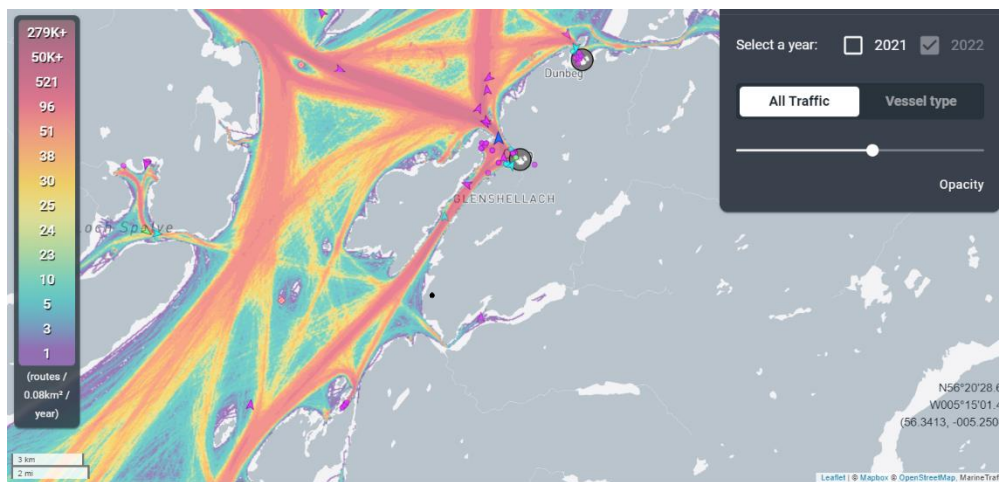


Fig 2 - AIS 2022 Density Map – centre dot is farm site

As can be seen from above, AIS using vessels movements can be assessed as low density marine traffic through the edges of the farm site. This data does not include small fishing or pleasure vessels that use the area.

Samudra have sought local input from marine users and community members and have been advised that small creel vessels fish within the unused area of the farm site, and have done so with cooperation from the previous site operators for over 5 years. Samudra will keep these local marine users well informed of any changes to our site structures.

The existing Special Marks are so placed as to make transit traffic, leaving or entering Loch Feochan, who's route takes then into or from the Sound of Kerrera, steer outside the Markers.

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The traffic in the area is seasonal in its diversity. Ardorrán Marine in Loch Feochan hosts several dozen moorings in summer. These are used by yachts who traverse the complex, very tidal entrance to the loch to gain access to the sailing grounds beyond. The difficulty of the entrance means that yachts rarely enter or leave the loch except on the top of the high tidal slack and in daylight. The yachts and the moorings at Ardorrán Marine are brought ashore over the winter closed season (October to April).

Coastal Connections are a cabin rib, private hire company with a half dozen fast Redbay cabin ribs of 9m to 11m in length. They operate from their Loch Feochan pontoons and shorebase on a daily basis. Coastal Connection also operate a small coded open workboat (Fingal – 6m) and an aluminium landing craft (Roshven – 11m), both of which are used as maintenance and workboats for the seaweed farm. Coastal Connection skippers all know the farm layout well and their powered vessels allow entry day and night in all conditions, year round.

Passage north and south from Sound of Kerrera, tends to keep west of the farm area.



03 Buoyage and Lighting Arrangement

The original site operators were advised by Northern Lighthouse Board (NLB), Marine and Coastguard Agency (MCGA) and Royal Yachting Association Scotland (RYAS).

The conventional system for marking aquaculture sites is by the installation at the seaward corners of Special Marks. These are large, yellow coloured floating buoys. They have a top piece of a yellow St Andrews Cross and solar panel charged battery powered lights which flash yellow at night. Special Marks (Fig 3) are used to mark hazards and their colour and lighting set up offers information to the observer on where safe passage is available relative to their position. The site is currently marked by 2 Special Marks (Fig 3). A 3rd Special Mark would be introduced as the site is developed over time.

The aquaculture site is to be clearly marked on updated paper and electronic charts by a dotted line at its limits and a fish and cage symbol within. The appropriate authorities and local marine users will be informed ahead of any changes to the lighting regime.



Fig 3 - Special Marks

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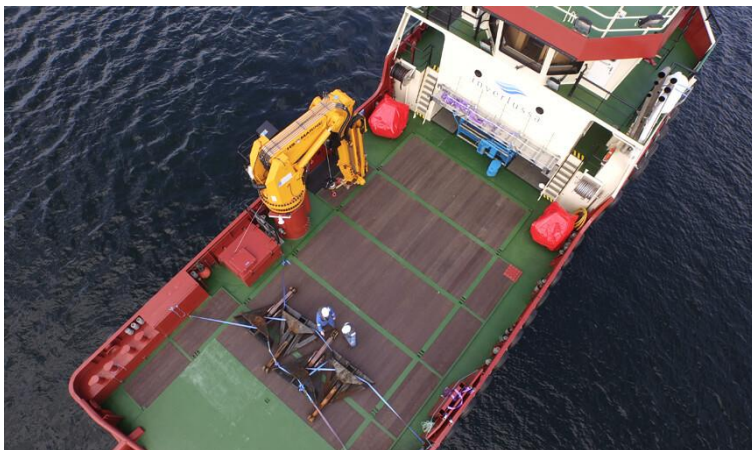
04 Deployment and Operational Vessels

To undertake the Deployment and operational work at the seaweed farm site, Samudra will charter the following style of vessels. These descriptions are to allow Statutory Consultees and Stakeholders to visualise the impacts. The exact charter companies and the vessels they will use are to be determined as contracts cannot be fixed at this stage of project development. Due to distance and speeds, it is envisaged that all vessels will make one journey in a day.

04.01 **Multicat**

Specialised flat bed mooring vessel ~28m x 10m. Speed - <12 knots.

This style of vessel will be chartered to deploy the anchors, navigational marker lights, subsurface and surface farm structures and be integral in site inspection and maintenance/repair and as emergency response contract vessels for Samudra. Highly versatile, they are fitted with Dynamic Positioning (DP) to accurately lay anchors in predesignated positions. May be supported by smaller vessels.



04.02 [Workboat](#)

Versatile landing craft style vessel ~18m x 5m. Speed - <8 knots.

This style of vessel will be the primary workhorse for seaweed farm Operational phases. The vessels have a large deck space and deck 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 seaweed harvested and waste rope collected. May be supported by smaller vessels. used to occasionally visit the site to observe the structural integrity, take sample of seaweed from the site and support larger vessels.



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04.03 Creel boat

Local fishing fleet vessels around 10m to 16m. Speed - <8 knots.

This style of vessel will be used to visit the site to observe the structural integrity, whilst passing to or from their fishing grounds. They may occasionally take sample of seaweed from the site and support larger vessels. There is the possibility of these vessels being chartered for deployment and operational phases.



Oban Harbour

04.04 **Fast workboat**

Rigid Hull Inflatable Boat (RHIB) or hard boat 8m to 10m. Speed - 20 knots.

This style of vessel will be used to occasionally visit the site to observe the structural integrity, take sample of seaweed from the site and support larger vessels.



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05 Transit Routes

Oban, to the north is the most likely harbour to be used during all phases of work on or at the farm. Smaller vessels may be used for regular checks, leaving from Loch Feochan to the east or from Clachan Seil to the south (Fig 3). There may be occasion for equipment to come in on vessels from further afield.

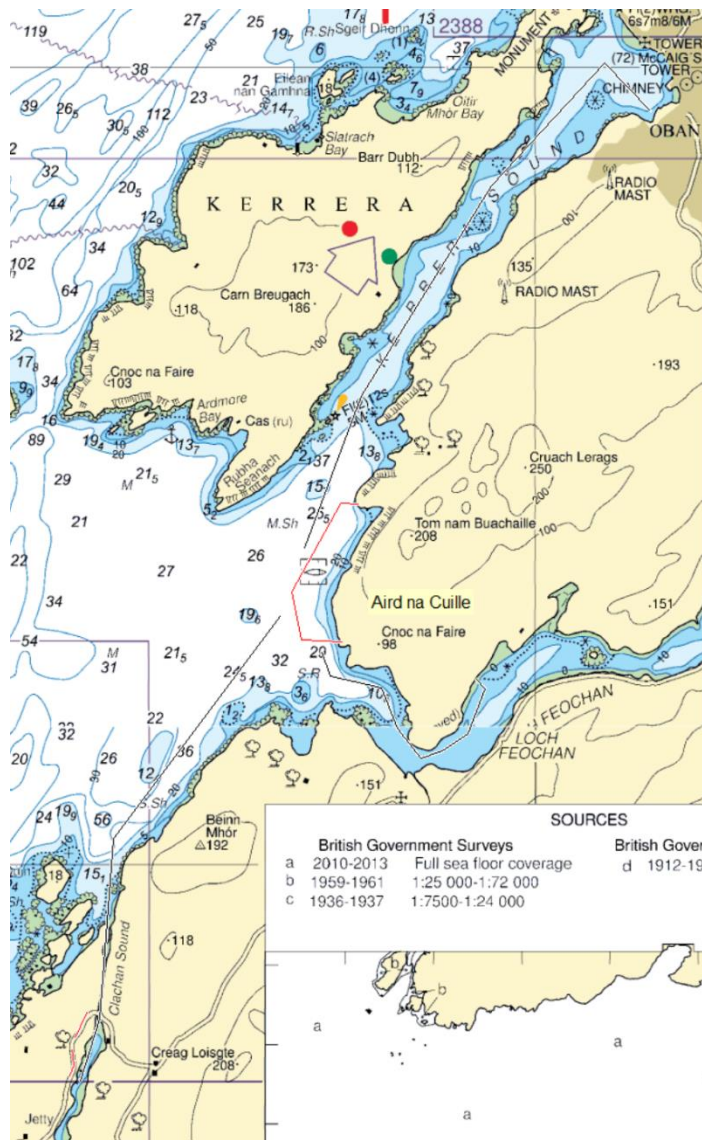


Fig 3 - Transit Routes (black) – Oban (8km), Loch Feochan (3km), Clachan Seil (6km) to farm (red). Samudra's planned operations are all likely to be conducted in daylight hours.

06 Development Phase

Samudra will ensure that before any equipment is deployed at the farm site, Samudra will inform NLB, MCGA, Local marine users and The Hydrographic Office. The exact date will be given upon which the 3rd Special Mark will be moved into position. The Hydrographic Office will ensure that Admiralty paper and electronic charts are updated accordingly.

06.01 Vessel use

During the deployment phases, Multicat - Dynamic Positioning (DP) work vessels will be brought in to accurately lay anchor blocks on the seabed. They are likely to be supported by smaller workboat or creel boat style vessels. The vessels are likely to work out of Oban, Loch Feochan or Seil to load equipment on board and transit the site via recognised transit lanes used by other Marine Traffic.

06.02 Phased Development

Samudra's desire is to have a substantial seaweed farm at the site. To do this, the aim is to develop Seaweed Grid Structures by late September 2025. This timing will allow one year operating the site with the existing small structures already deployed. These structures are a small 50m x 50m test grid and a 200m longline system (Fig 4).

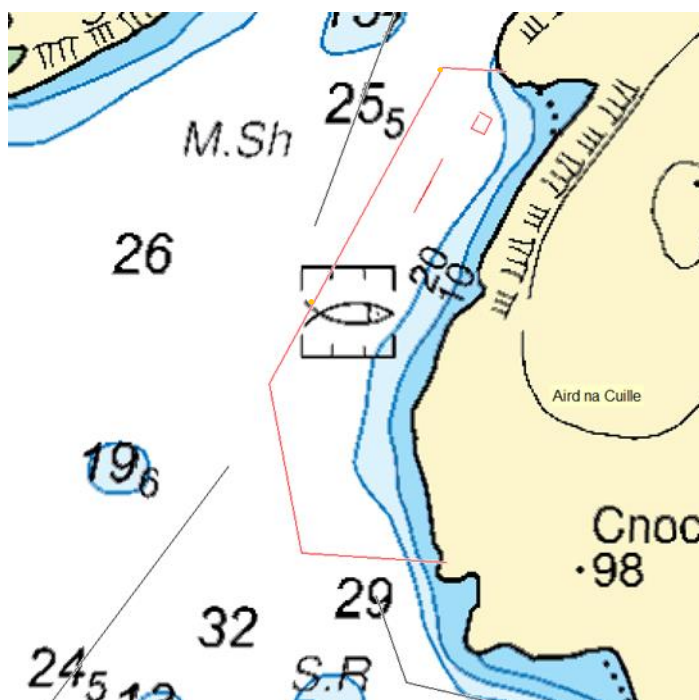


Fig 4 - AnC existing structure - Farming area (outer red lines) is the limit of farming license. (red square and line) is the existing grid and longline. Yellow dots are existing Special Marks.

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In summer 2025 it is expected that Samudra will plan to deploy seaweed farm grids at the Aird na Cuille site. Each grid is 200m x 100m and is easily seen on the surface as you near a site as it presents as 2 x 200m long double headline of floats similar to a mussel farm. All works will be contained within the already consented licensed area (Fig 5). The site can accommodate up to 9 of these grids (Fig 6).

It is envisaged that the timing of this work will still allow for predictable weather and long daylight hours to complete the work. It is hoped the work will take no more than 3 weeks for this phase of work.

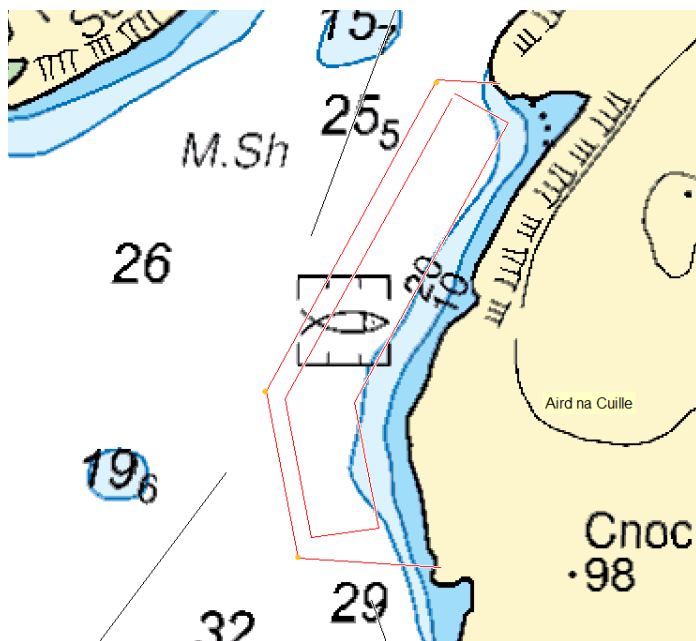


Fig 5 – Phased development – Farming area (outer red lines) is the limit of farming license. (inner red lines) is the expected footprint of the completed farm. Yellow dots are existing 2 x Special Marks (one moved south), plus 3rd added.

This phased development cannot be predicted as it will be dependant on many factors beyond Samudra's direct control, such as investment, development of processing capacity, market driven externalities etc. It is however envisaged for the years 2025 or 2026. This will see Samudra potentially deploy 2 or 4 grids at the site. This will be to the north end and away from relatively open navigable waters.

As the seaweed farm begins to provide harvests for Samudra's new processing facility (in Oban or beyond), Samudra will evaluate the timing of further phases of development. As before, the timing of this work will be set to be completed before late September to take advantage of more predictable weather and longer daylight hours.

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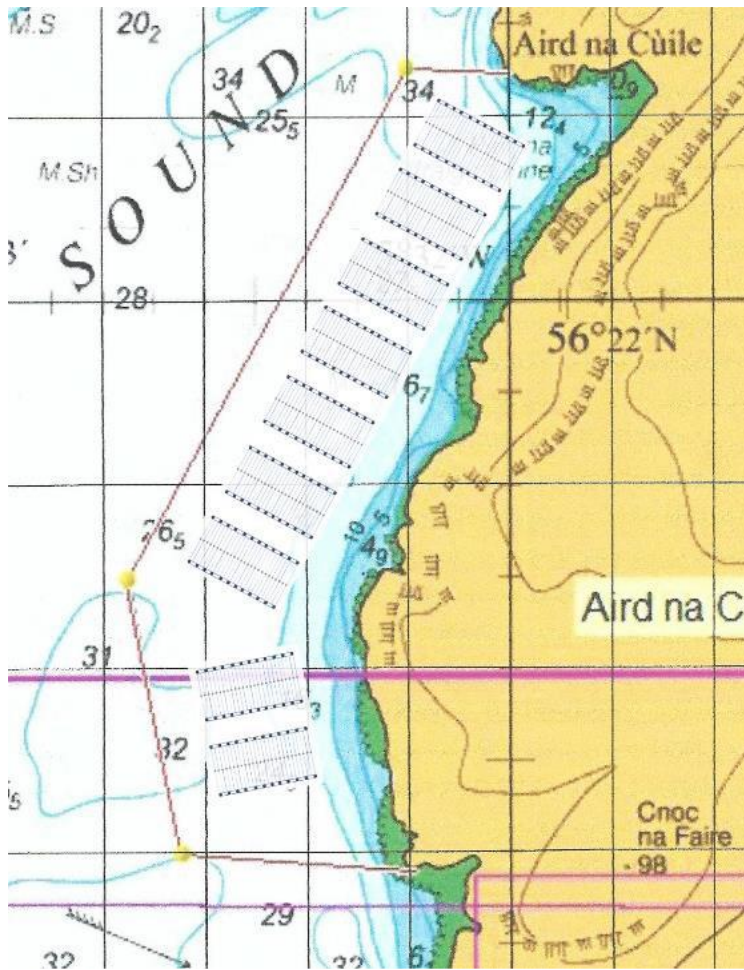


Fig 6 – Fully developed seaweed farm system and AnC. Farm area (red) 9 grids with 2 pairs of headlines each (black) – 3 x Special Marks (yellow).

07 Farm Operations

Samudra will undertake 2 main Operational Phases. Growing Line Deployment Phase and Harvesting Phase. A further Intermediate Phase will also be described for clarity. During the Operational phases, Workboat and Creel fishing vessels will be brought in to deploy Growing Lines and to Harvest seaweed.

They are likely to be supported by smaller RHIB or hard boat style vessels (in Operational and in an Intermediate Phase). The vessels are likely to work out of the smaller shorebases in Loch Feochan or Clachan Seil. The vessels will load and unload equipment and seaweed and transit the site via recognised transit lanes used by other Marine Traffic.

07.01 Growing Line Phase

Seaweed Cultivation is an overwintering crop with the deployment of seeded seaweed Growing Lines beginning in mid-October completed by mid-November each year. There is also the possibility of Growing Line deployment in late-January to early-February. As the farm size increases, the time taken to complete the Growing Line deployment will take, but it is hoped that technological advancements will increase efficiency accordingly.

With the current in water equipment, it is expected that Growing Line deployment will take no more than 2 days. For a fully developed farm site, it is expected that Growing Line deployment will take 2 to 3 weeks.

07.02 Harvesting Phase

The harvesting of the matured seaweed plants begins in early-March and ends in late-May.

With the current in water equipment, it is expected that Growing Line harvesting will take place over a 2 week period, with roughly 1 harvest vessel journey to the site per week, harvesting up to 5 tonnes per harvesting visit.

For a fully developed farm site, it is expected that Growing Line harvesting will take place over an 8 week period, with roughly 3 harvest vessel journeys to the site per week, harvesting up to 10 tonnes per harvesting visit.

07.03 Intermediate Phase

Outside of the Growing Line Deployment and the Harvesting or Operations phases, the seaweed farm will either be fallow or largely left unattended while the seaweed grows. Vessels will visit the farm weekly to inspect the site to check on the structures (part of the license conditions) and to check on plant growth and crop quality.

08 Monitoring Arrangements

Samudra will ensure that the Aird na Cuile seaweed farm will be regularly inspected by certified mooring specialists. A provision will also be made for the continuous monitoring of the Seaweed Farm outwith its operational growing period. The site will be regularly visited by farm operatives by vessel. A record of visits and inspections will be kept by Samudra and made available to any inspecting MCA staff on request.

It is essential that the navigational and health and safety regulatory expectations for mooring systems are set in proportion to the potential risks with a view to develop a safe and sustainable seaweed growing platform for the long term. To do that Inverlussa Marine (as yet unofficial), with over 20 years experience in design, installation and maintenance of marine structures will deploy a bespoke designed Seaweed Farm for Samudra (Fig 7) that uses oversized ropes, chains and anchors to ensure the structure;

- can withstand such forces acting on it as are reasonably foreseeable including;
 - Environmental conditions, e.g. winds, waves, tidal currents
 - Loads during operational conditions including normal operation, contact loads from access boats and temporary loads during maintenance operations.
 - The weight of the installation and anything on it, buoyancy, drag and inertia forces from movement
 - Unplanned incidents including vessel impact
- its construction, commissioning, operation, modification, maintenance and repair of the Seaweed Farm may proceed without prejudicing the structure's integrity.
- in the event of reasonably foreseeable damage to the installation or its moorings, it will retain sufficient integrity to enable action to be taken to organise appropriate safe repair, thus preventing mooring failure (thereby becoming a navigational hazard).
- it may be decommissioned and dismantled safely.

The farm design is sufficiently robust to withstand the most extreme weather conditions to be found at site and be well within the tolerances of the structures. Factors tested are the worst case scenarios (i.e. the effect of the worst winter storms impacting the farm when it is most heavily laden with seaweed biomass in late spring).

The design has already been used and proven in licensed farms on the west coast (e.g. South West Mull and Iona Development, Mull). This farm is now completed its third winter without issues. The anchoring system used will be robust to ensure farm's stability but use the minimum amount of infrastructure possible to reduce the footprint of the site and reduce seabed impact.

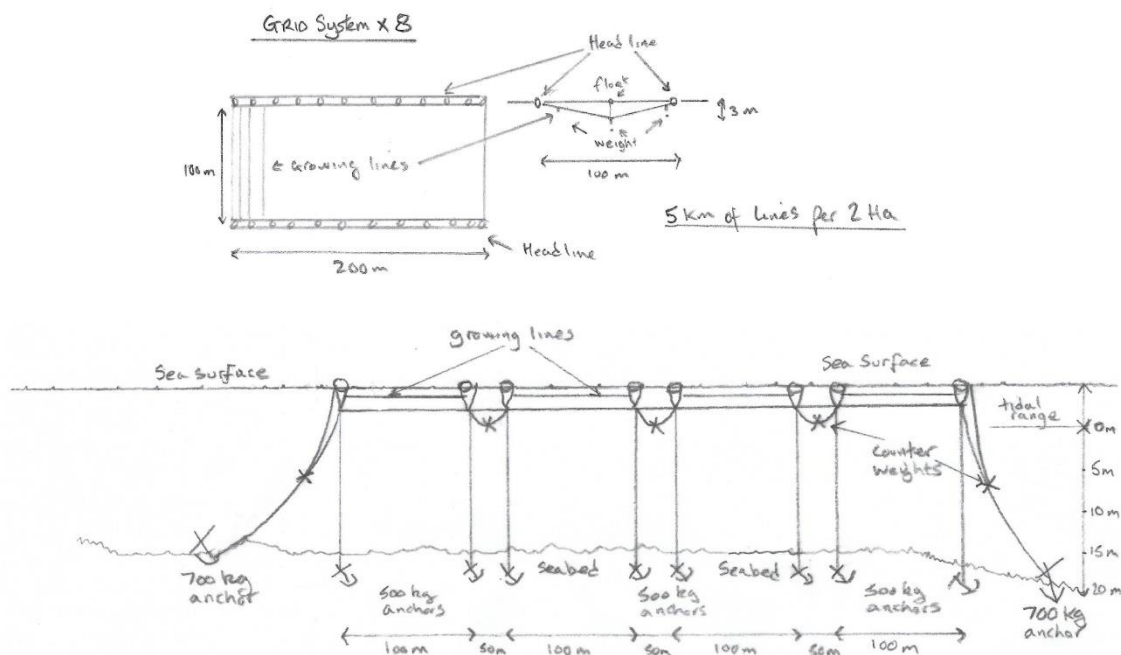


Fig 7 - Side and top view plan of grid system at sea farm site

09 Decommissioning Plan

Samudra have been trading since early 2023 and are investing heavily in the Seaweed Cultivation industry. The seaweed harvest this Farm will grow, will become high value ingredients across multiple product lines. Samudra are in consultation with processors and on developing onshore facilities for the movement and processing of their product. The cultivation of seaweed at their new seaweed farm will strengthen the supply of seaweed to the whole Scottish sector.

The Seaweed Farm design has been made with long service in mind. The use of heavy ropes rather than chains will allow a decade or more of operation before major replacement of parts are required.

Should the business venture founder, Samudra will hold back sufficient funds to enable the Seaweed Farm to be removed from site. The surface structure can easily be detached and towed to shore. The anchors that hold the structure in place can be simply lifted to the deck of a winch enabled vessel. The cost of decommissioning would be a fraction of the cost of deployment and the sale of the anchors and floats at the site should easily cover the cost of works.

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10 Emergency Response Plan

This plan will exist both here for information and as a stand alone document that will be circulated to local HM Coastguard and RNLI stations, local vessel users, local houses and on a signpost overlooking the harbour at Stein.

Emergency scenarios and response

- vessel stranding – in the event of a vessel entering the Seaweed Farm exclusion zone and colliding with the Farm structure, the first concern is the safety of the vessel and crew. **999** should be called and the coastguard/RNLI informed. SAMUDRA should also be contacted (number below) and repairs to the Farm structure will be enacted.
- cetacean entanglement – in the unlikely event of a seal, whale, dolphin or basking shark becoming entangled in the Seaweed Farm lines, The British Divers RESCUE HOTLINE: **01825 765546** should be called - <https://bdmlr.org.uk/>
- float loss – occasionally, some line floats may become detached from the Seaweed Farm structure. This will not degrade the integrity of the Farm structure, but Samudra should be contacted (**number below**) so the float can be recovered and the replaced back where it came from.
- Storm damage/loss of integrity of the structure – the design of the Seaweed Farm is such that multiple anchor lines hold the structure in place and the loss of several of these lines would not degrade the integrity of the Farm. But should it be observed that the Farm structure has been damaged or worse, lost from its moorings **999** should be called and the coastguard informed. Samudra should also be contacted (**number below**) and emergency repairs to the Farm structure will be immediately enacted. Local vessels (fishing and aquaculture boats) will be retained as emergency response and ropes, floats and other equipment held in preparation for such emergency repair at shore base 1 mile to the east.

Samudra Contact details (to be contacted in all scenarios)

Stevie Jarron	Argyll Aquaculture	Marine Coordinator	+[Redacted]
			+44 1852 350 056
	Coastal Connection	Marine Provider	+44 1631 565 833
			[Redacted]



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MARINE EMERGENCY ACTION CARD

For *Samudra – Loch Bay Seaweed Farm*

Development summary (include details of the design, numbers of units/structures, mooring arrangements, subsea information, etc.) A full description including diagrams must be included below.

Emergency Contact
One of the following or a combination of both, must be 24/7

Duty Holder name	Stevie Jarron
Primary number	[Redacted]
Secondary number	+44 1852 300 056
Media relations (if applicable)	n/a
Coastguard	999
Police	999

Insert a picture/drawing of the device

See attached photograph of Special Marks and specification of light below

Development location	
Range & Bearing from land	South of Aird na Cuile point. South end of Sound of Kerrera, to mouth of Loch Feochan.
Dimensions of the area	350m x 1,350m
Number of devices	3

Device Specific information (adapt to suit the device)

Heights/depths (m and ft)		Lights / Markings	
Height above sea level	Focal height of light 2420mm	Lights	3 x (Y Fl 5s)
Depth below surface	1.2m	Marks	Yellow
Height above seabed	25m OD		

SPECIAL MARK



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<p>Details of regular maintenance activities</p> <p>Weekly visual inspection from shore or vessel. Records will be kept for inspection by Samudra. See example sheet in details.</p>	<p>Summary of number of personnel working offshore and emergency response capabilities</p> <p>Site is fallow until October, There will be no work done at site until then.</p>
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<p>Details of vessels operating to/from the development – include name, callsign, description, communications (e.g. channels used), number of crew, operating limits, etc.</p> <p>No vessels are yet owned by Samudra. Operations at the site begins in October 2024. This form will be updated as staff and vessels are assigned to the work.</p> <p>Various vessels will keep visual contact on site as they pass. Local work/fishing vessels will visually inspect site regularly. Records will be kept for inspection by Samudra.</p>	
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Personal SAR Locating Device Make & Model				
Functions: yes/no	COSPAS-SARSAT	AIS	DSC	121.5MHz
	n/a	n/a	n/a	n/a

<p>Additional information pertinent to the development</p> <p>No vessels are yet owned by Samudra. Operations at the site begins in October. This form will be updated as staff and vessels are assigned to the work.</p>	
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