Argyll and Bute Council

Oban Harbour

Navigational Risk Assessment

May 2023

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Notice

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Executive Summary

Argyll and Bute Council (A&BC) has commissioned ABPmer to carry out a Navigational Risk Assessment (NRA) in support of its Harbour Revision Order (HRO) application. The intent of this application is to extend the current A&BC harbour authority area to encompass all of Oban Bay and its approaches in the interests of improved marine safety. As part of this application, a requirement to evaluate navigational risk within Oban Bay and the Sound of Kerrera is required.

Oban Bay is located on the West Coast of Scotland within the Firth of Lorn. The bay in which the town of Oban is situated occupies a strategically important location for maritime traffic, having two natural harbour approaches, namely the North Channel and the longer Sound of Kerrera approached from the south. Oban is a busy harbour with a variety of maritime traffic operating from a range of piers, jetties, slipways, pontoons and moorings.

To inform the NRA, a marine traffic survey was undertaken during a busy summer period between Monday 18 to Sunday 31 July 2022. A second survey was arranged to characterise a quieter period between Saturday 03 to Friday 16 December 2022. Together, this represents 28 days of marine traffic information.

To assess navigational risk, all marine operations which take place in the existing A&BC harbour areas, plus the proposed harbour area included in the HRO application have been considered through a Hazard Identification workshop (HAZID). The HAZID was carried out onsite in Oban with a stakeholder group drawn from the local port community. Following the workshop, the resultant risk assessments were compiled and circulated to attendees for comment.

In total, 37 hazard scenarios were identified and assessed. From the NRA process, 35 future marine risk controls (mitigation measures) were identified, these were made up of newly identified controls and existing risk controls which would be applied to a larger harbour area. All new and existing risk controls will require appraising by the Council prior to adaption. Following implementation of appropriate mitigation by the Council, within the context of the proposed harbour area, marine risk to navigational receptors can be maintained within a level that is ‘As Low As Reasonably Practicable’ as required by the Port Marine Safety Code.

This NRA also considers and supports the proposed harbour limits. The collection of marine traffic data has identified areas of intensity through vessel patterning, which have been used to inform the creation of navigational risk assessments for the study area. The identified harbour limits have been established based on marine traffic intensity, ferry routes and user consultation.

Contents

Appendices

Tables

Figures

1 Introduction

1.1 Scope of work

Argyll and Bute Council (A&BC) has commissioned ABPmer to carry out a Navigational Risk Assessment (NRA) in support of its Harbour Revision Order (HRO) application to extend the current A&BC harbour authority area to encompass all of Oban Bay and its approaches in the interests of improved marine safety. As part of this application, a requirement to evaluate navigational risk within Oban Bay and the Sound of Kerrera is required.

1.2 Study area boundary

Oban Bay is located on the West Coast of Scotland within the Firth of Lorn. The bay in which the town of Oban is situated occupies a strategically important location for maritime traffic, having two natural harbour approaches, namely the North Channel and the longer Sound of Kerrera approached from the south. The natural harbour of Oban is busy with maritime traffic operating from a range of piers, jetties, slipways, pontoons and moorings. The study area considered in this NRA includes all of Oban Bay, its approaches via the North Channel and the South Channel (Sound of Kerrera); see Figure 1.

1.3 Legislation and guidance

The following section identifies relevant legislation relating to port and navigational assessments.

1.3.1 Primary legislation

International protocols and conventions relating to safety, laws of the sea and pollution apply to shipping and ports. The UK Government has a responsibility to ensure that measures are implemented in order to honour its commitments to these protocols. Not least of these, is the UK's responsibility under Article 60 (7) of the United Nations Convention on the Law of the Sea (UNCLOS) relating to provisions for 'Artificial islands, installations and structures in the exclusive economic zone'. An NRA is one process by which the necessary considerations for port and harbour changes can be evaluated. Sea ports and harbours provide the interface between the land, near shore and open sea. The UK Marine Policy Statement (2011) identifies, in relation to marine authorities and decisions makers, that:

> *"Marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety; and ensure that their decisions are in compliance with international maritime law" (UK Government, 2011).*

The majority of port operations are administered by a Statutory Harbour Authority (SHA). Every SHA is self-governed with specific local Acts and Orders defining its powers, duties and responsibilities. Underpinning the powers of an SHA is a range of national legislation which places statutory responsibility on the Harbour Master to ensure navigation and safety within the harbour limits; this includes the 'Harbours, Docks and Piers Clauses Act 1847' and the Harbours Acts 1964. Under such legislation, the Harbour Master may issue general or specific directions to control movements of vessels within their SHA in order to ensure safety.

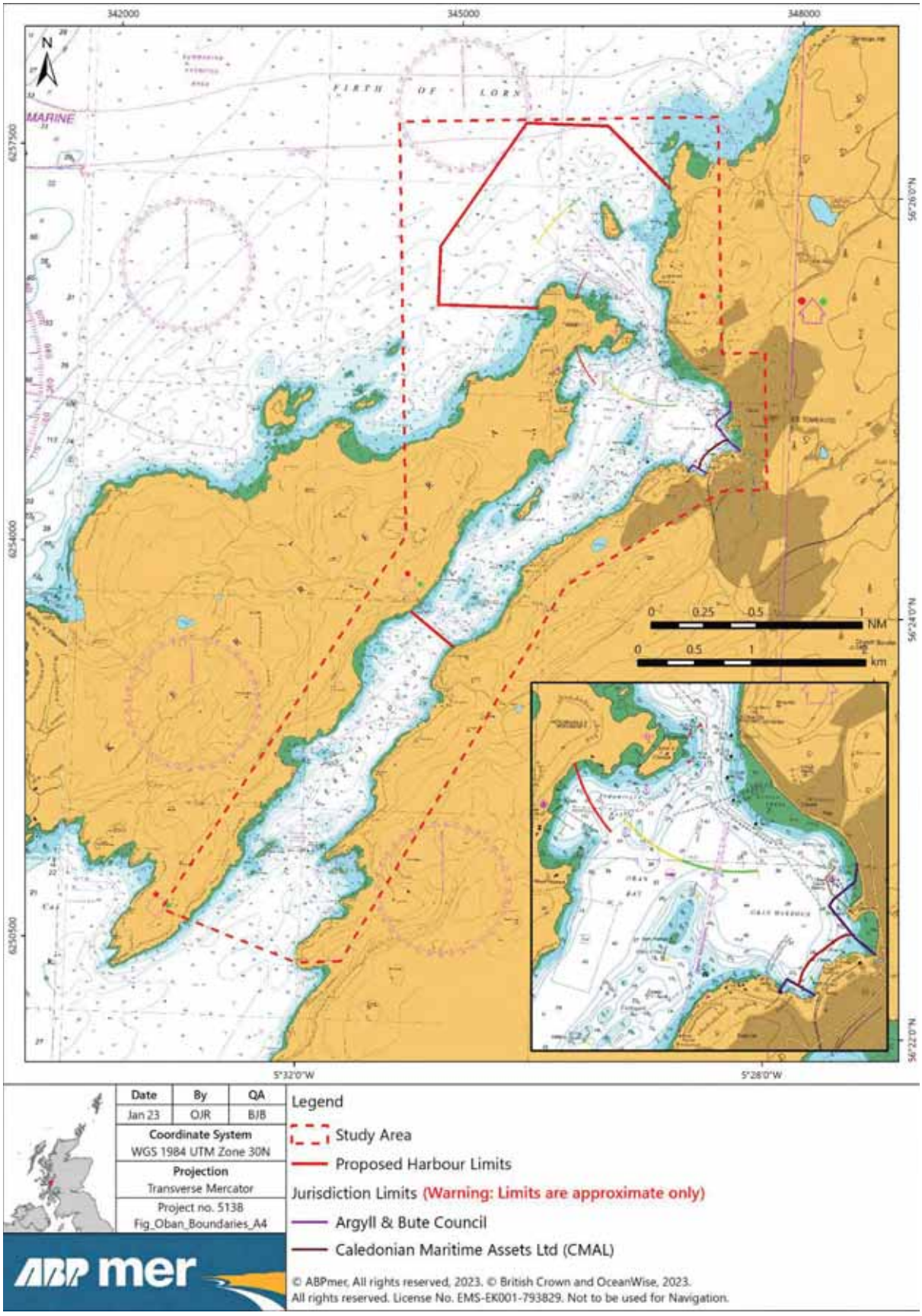

Figure 1. Study area

1.3.2 Secondary guidance

The UK national standard for the safe and efficient running of ports is the Department for Transport's 'Port Marine Safety Code' (DfT, 2016) and its accompanying guidance document 'A Guide to Good Practice on Port Marine Operations' on which this NRA methodology is based (DfT, 2018).

The Port Marine Safety Code (PMSC) and its Guide to Good Practice (GtGP) are the principal documents used in this NRA. The following documents, which provide supplementary guidance, have also been taken into account in the preparation of the NRA insofar as they are relevant. It should be noted that the documents listed below cover a wide range of guidance advice for marine activities, not all of which are applicable to the HRO application:

- International Maritime Organization (IMO) Revised Guidelines for Formal Safety Assessment (FSA) for use in the IMO rule making process (IMO, 2018); and
- Marine Guidance Note (MGN 654) Offshore Renewable Energy Installations (OREI) safety response. Incorporating: Annex 1 Methodology for assessing marine navigational safety and emergency response risks of OREIs. Maritime and Coastguard Agency (MCA, 2021).

As the competent authority for marine safety, the MCA has been consulted in respect of the marine traffic data collection. In addition, in its capacity as the General Lighthouse Authority, the Northern Lighthouse Board (NLB) has been consulted by A&BC during the HRO process.

1.3.3 ALARP principle

The PMSC defines the term 'ALARP' as being 'as low as reasonably practicable', (DfT, 2016). ALARP is an industry-wide standard, applying to both health and safety and port marine safety. Central to this standard is the term 'reasonably practicable'. To meet this standard, the NRA balances risk against the effort, time and money required to control the risk. The PMSC specifically references ALARP as an underpinning rationale for Marine Safety Management Systems (MSMS)[1] and marine risk assessments.

Risk assessment is based on a comprehensive and formal assessment of hazards and risks with a view, following assessment and mitigation of the more severe scenarios, to either eliminating the hazards and risks or to reducing them to the lowest possible state, so far as is reasonably practicable. Where a project is proposed which may alter the navigable environment, the promoter of the scheme must consult with those likely to be involved in or affected by such alterations. The overriding aim is to ensure that any consequential risk is reduced to meet the standard of ALARP.

The ALARP principle has been applied with respect to each individual assessment in this NRA to consider if the identified hazard(s) can be reduced to a point which is both 'reasonable' and 'practicable'. In so doing, within this NRA, ALARP has not been defined as a threshold or benchmark target with each hazard scenario being risk assessed to reach its own ALARP conclusion.

[1] A system to manage the hazards and risks along with any preparations for emergencies – it should be developed after consultation, based on formal risk assessment and refer to an appropriate approach to incident investigation (DfT, 2018).

2 Data Sources

The following section details the origin of the data used to create the baseline to inform the NRA.

2.1 Marine traffic survey

To inform the NRA, a marine traffic survey was undertaken following guidance in MGN 654 (MCA, 2021a) which defines the need for a 'NRA Traffic Survey'. The requirement is a minimum of 14-days recorded during a busy marine traffic period and 14-days from a quiet period. The survey periods selected are shown below and were selected based on statistical vessel call data held by A&BC. The survey periods were:

- Summer Survey (busy period), July 2022, Monday 18 to Sunday 31 inclusive, and
- Winter Survey (quiet period), December 2022, Saturday 03 to Friday 16 inclusive.

Data from these survey periods collected Automatic Identification System (AIS) information and visual observations for vessels not carrying AIS equipment (termed non-AIS vessel traffic in this document). For vessels not carrying AIS, observational data has been collected. Observations from two locations were utilised as shown in Figure 2 with red and green triangles identifying the two different observation points. The marine traffic survey is reported separately in ABPmer Report R.3974 (ABPmer, 2023), key information has been reproduced in this document.

2.2 Local stakeholder consultation

In addition to the traffic observation ABPmer, in association with A&BC consulted with local operators to obtain anecdotal information on vessel traffic routeing and activity levels within the Oban Bay and its approaches. The aim of this consultation was to provide validation of vessel traffic data, especially for vessel moves that may not occur during the 14-day onsite observations. It should be noted that this consultation was in addition to the NRA stakeholder engagement, which can be seen in Section 6.

This section describes the specifics behind the data collection method used.

2.3 Non-AIS vessels

Visual observations were used to collate vessel track information using a combination of Closed-Circuit Television (CCTV) cameras, ferry bridge observations and local stakeholder consultation on vessel routeing. Spatial information was recorded on an internet based Geographic Information System (GIS) Application (GIS-App) for later integration into the traffic picture. Vessels carrying AIS were excluded from the observational data, thereby providing a complementary set of information to quantify vessel activity over the two 14-day survey periods. ABPmer's data capture tool allowed the observer to draw vessel tracks for singular vessels or polygon shapes in order to capture a group of recreational users operating in a specific area, for example kayakers, paddle boarders or sailors.

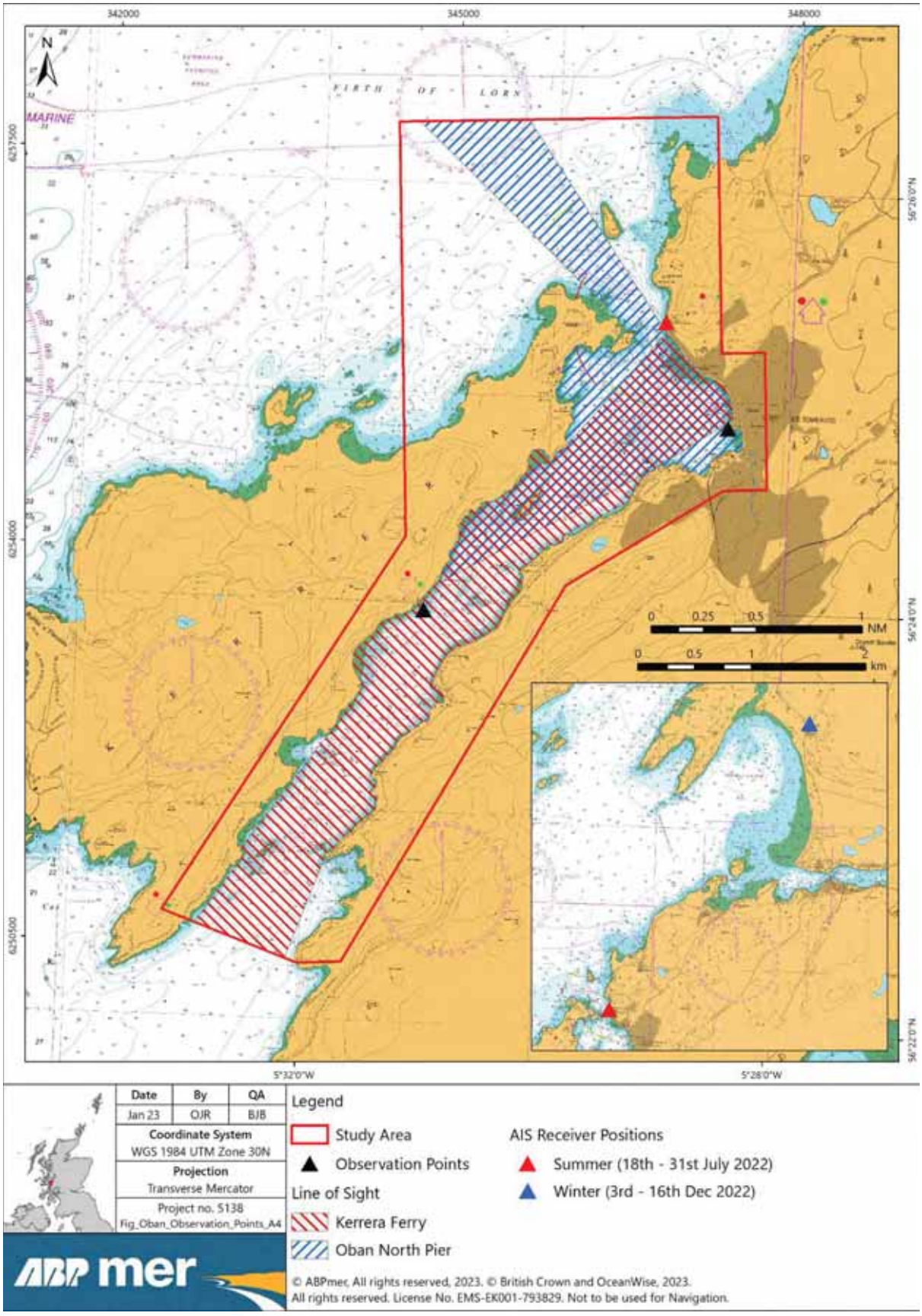

Figure 2. Observation locations

2.4 Automatic identification system data

AIS data was obtained from a number of sources and merged to provide a composite dataset. Due to data availability from service providers, the following approach was used

- Summer survey: AIS data recorded by CalMac Ferries Limited (CFL); and
- Winter survey: AIS commercial suppliers.

The location of AIS receivers used to collect data displayed in this study is shown in Figure 3.

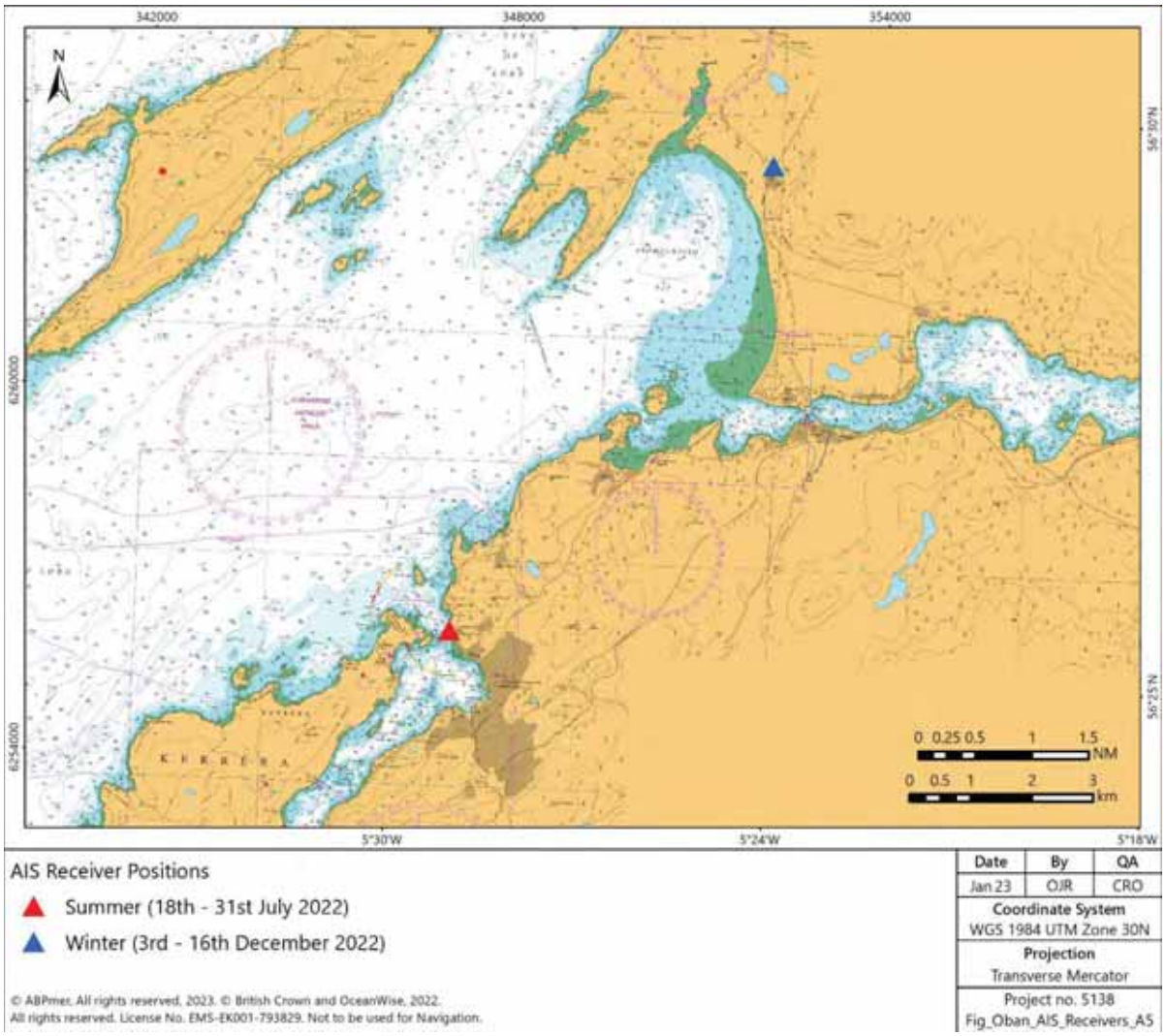

Figure 3. AIS receiver locations

AIS signals are broadly classified as 'Class A' and 'Class B'. AIS-A is carried by international voyaging ships with gross tonnage (GT) of 300 or more tonnes, fishing vessels with a length of 15 m or greater and all passenger ships regardless of size. AIS-B is carried by smaller commercial vessels, the fishing sector and recreational vessel users; however, the use of AIS-B is non-compulsory. Both AIS-A and AIS-B data have been used within this study.

The AIS data has been broken down using the following vessel categories which are taken directly from the AIS data transmissions:

- Non-port service craft;
- Port service craft;
- Vessels engaged in dredging or underwater operations;
- High speed craft;
- Military or law enforcement vessels;
- Passenger vessels;
- Cargo vessels;
- Fishing; and
- Recreational.

2.5 Recreational activity

Data for recreational activity in the study area has been collated using a variety of methods. Quantitative data has been derived from AIS-B records and observational data recorded on the GIS App. Stakeholder consultation, anecdotal and website information has been compiled from local recreational clubs, this includes information from local yacht and sailing clubs, Royal Yachting Association (RYA) routeing information, race route maps, and analysis of passage plans and yachting guides.

2.6 Navigational features

Navigational features have been considered in this assessment and have been identified using information from UK Hydrographic Office (UKHO) Admiralty Chart Number 1790.

2.7 Maritime incidents

To characterise maritime incidents occurring within the study area, available data has been collated from a number of sources. These included records held by local harbour authorities, the Royal National Lifeboat Institution (RNLI) call-out data and Marine Accident Investigation Branch (MAIB) records.

2.8 Environmental conditions

Metocean conditions for the study area have been compiled using the SEASTATES dataset provided by ABPmer. The data represent historical hourly wind and wave characteristics for a 40-year period to provide analysis of conditions for the area.

3 Navigational Baseline

The following section reviews the navigational baseline conditions for commercial shipping and recreational navigation within the study area. The following elements are covered in the baseline:

- Navigational environment;
- Statutory responsibilities and management procedures;
- Recreational facilities;
- Fishing activities;
- Ferry activities;
- Aids to Navigation (AtoN);
- Metocean conditions;
- Emergency response; and
- Marine incidents.

3.1 Navigational environment

Oban Bay itself is a near perfect horseshoe shape, protected by the Island of Kerrera to the west; and beyond Kerrera, the Isle of Mull. The bay has a number of rocky outcrops and ledges, most notable of these is Sgeir Rathaid, a rocky hazard bound by cardinal marks; and Corran Ledges marked by a line of lateral marker buoys. Vessel access to the bay is via the North Channel from the Firth of Lorn or the longer South Channel along the Sound of Kerrera. For reference, study area locations names are shown in Figure 4.

North Channel: The North Channel is the main navigable access route into Oban Bay. It is bounded by Kerrera Island and the mainland coast, making it fairly narrow with shallow waters to either side. The approach to the North Channel is from the northwest. Maiden Island is located to the north of the opening of the channel. There is a narrow passage of navigable water between Maiden Island and the Scottish mainland used by smaller vessels. Admiralty Chart 1790 denotes the establishment of a Large Vessel Channel, which small vessels should remain outside of as far as is safe and practicable. Also shown is a Small Vessel Route that follows to the south and west of the Large Vessel Channel.

South Channel: The South Channel is a longer passage running the length of Kerrera Island. At its southern end, the width constrained channel commences at the Sgeir an Fheurain channel marker buoy. Further along the channel, the navigational hazards of 'Ferry Rocks' are marked out by an East Cardinal navigational mark, the marked channel passes to the west of these rocks which are submerged at high tide. Approximately halfway along the Sound of Kerrera is the ferry crossing point between Gallanach and Kerrera Breakwater, used primarily by the lifeline ferry service operated by CFL. A further slipway is located to the south of this crossing point at Gallanachbeg Slipway. The South Channel finishes at Heather Island where the main fairway opens out into Oban Bay.

Oban Bay and Harbour: The Oban Bay and Oban Harbour area has a number of marine facilities. These include Oban North Pier and North Pier Pontoons which are operated by A&BC. The North Pier provides 75 m of solid berthing face, typical used by large charter vessels, aquaculture vessels, bulk cargo (forest products, road salt, local industrial goods) and layby berthing for CFL vessels. The Railway Pier, Ferry Terminal and adjacent slipway which are owned by Caledonian Maritime Assets Limited (CMAL) with the harbour operations managed under contract by CFL. The Railway Pier is comprised of two dedicated linkspan berths (termed Berth 1 and Berth 2) and is predominately used by fishing vessels at its east end.

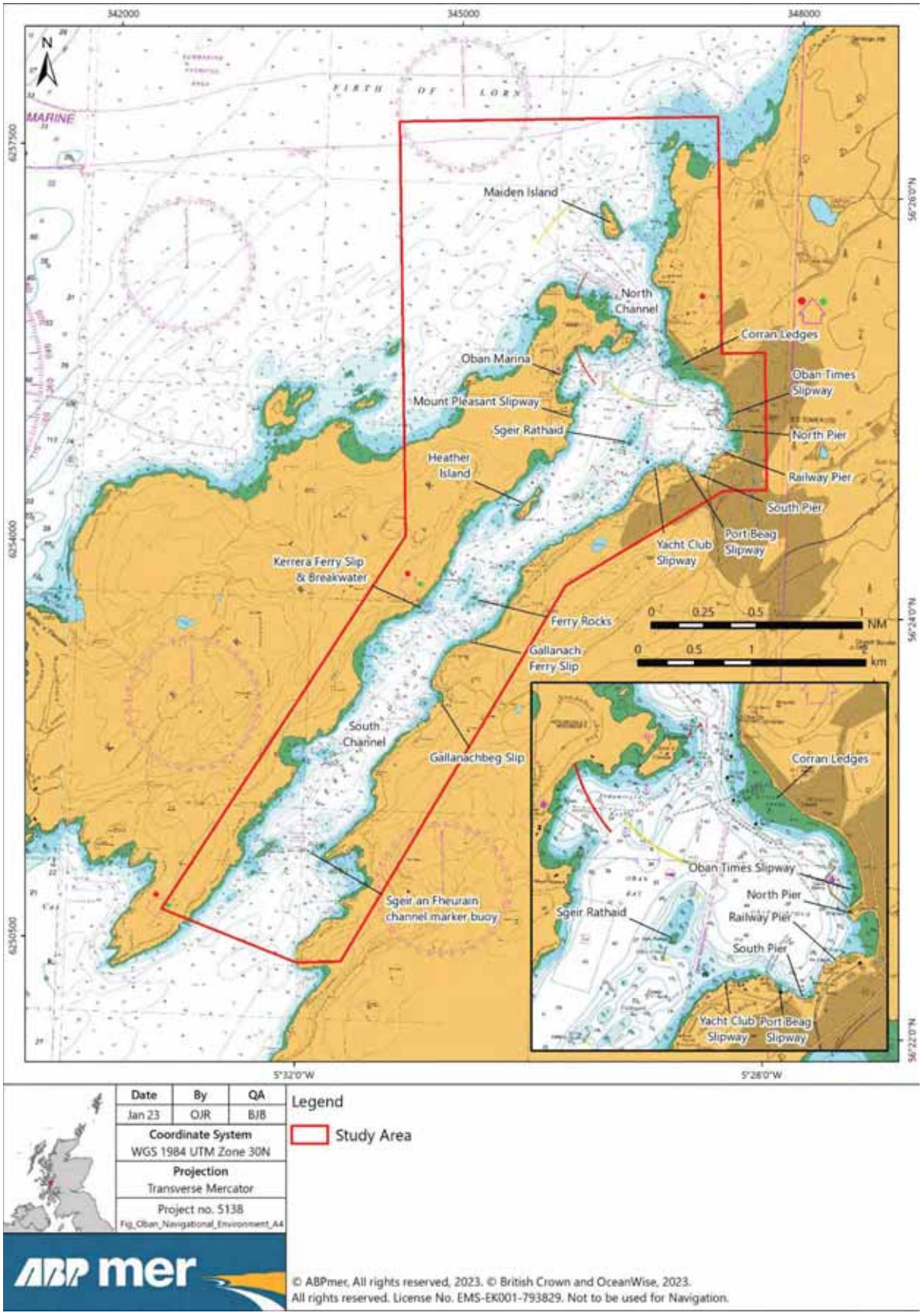

Figure 4. Study area location names

Workboats, fishing vessels and recreational vessels visit the Railway Pier to collect bunkers (dispensed fuel) from a shoreside tank. At the east end of Railway Pier, the Wildlife Tour Boat Motor Vessel (MV) *Purple Heather* operates seasonal one-hour tourist excursions. The slipway is also used by the Lismore Ferry and periodically by commercial vessels for shipping freight, construction materials or heavy loads.

To the west of Railway Pier is South Pier, this is used by fishing vessel landings with an ice plant and shoreside storage. Berthing at the South Pier is controlled by CFL with the pier landside operations managed by Oban Port Users Limited. Adjacent to the western end of the South Pier is the Oban RNLI lifeboat station.

The NLB run a depot and terminal located between the RNLI station and the Oban Yacht Club. This facility is located on the South side of Oban Bay and provides facilities for ship berthing, painting and repairing buoys, landing and refuelling helicopters, plus a range of engineering support services. The NLB also offer a limited commercial berthing service, which is predominantly used by smaller cruise vessels.

Oban Bay and its surrounding area has a number of slipways, including the Port Baeg Slipway which is owned and operated by A&BC, Oban Times Slipway, Town Slipway, Oban Yacht Club Slipway and Town Slipway. CMAL is the marine facility owner for the slipway at Gallanach and the breakwater and slipway on the Island of Kerrera. The slipway on Kerrera is occasionally used by commercial vessels for shipping freight, construction materials or heavy loads. The breakwater on Kerrera also provides for mooring on its north-east face, with quayside mooring points and fendering. For reference, slipway locations are shown in Figure 4.

Oban Bay also has a history of use by aviation. The bay previously hosted a regular passenger service operated by Loch Lomond Seaplanes flying to a range of destinations including Glasgow. Information on UK Hydrographic Office (UKHO) Chart 1790 identifies the indicative 'Seaplane Operating' area. At the time of carrying out this NRA, a regular passenger service has not been in operation for several years. The NLB support base also incorporates a helipad, the operation of which has been considered within the scope of the study to recognise the potential for interaction between aircraft and vessels in the near vicinity.

3.2 Statutory responsibilities and management procedures

The history is complex and includes both the (current) A&BC harbour undertaking at the North Pier, the South Pier and the CMAL owned undertaking at the Railway Pier.

3.2.1 Argyll and Bute Council

A&BC is the Statutory Harbour Authority (SHA) for Oban North Pier with an area defined in Section 22 of the 'Pier and Harbour Orders Confirmation (No.5) Act 1896, Schedule 2, Oban Improvement and Maintenance of Piers'. The Council also has a smaller statutory area at Oban South Pier as laid out in Section 18 from Schedule 2 of the 1896 Act. The pier areas form part of A&BC's Municipal Harbour Authority, being owned and operate by the Council. Within its SHA areas, A&BC is also the Local Lighthouse Authority (LLA) with respect to aids to navigation by virtue of Section 193 of the Merchant Shipping Act 1995. A&BC is not a Competent Harbour Authority with regards to Pilotage.

The following local legislation is in place and cited as the 'Oban Piers and Harbour Orders 1862 to 1896'. This includes the following documents:

- Pier and Harbour Orders Confirmation Act 1862, Oban Harbour Order.
- The Oban Pier and Harbour Order 1864.
- Pier and harbour Orders Confirmation (No.5) Act, 1896, Schedule 2, Oban Improvement and Maintenance of Piers.

Description of the harbour limits can be found in Sections 22 and 18 of the 1896 Act, with a representation of these limits shown on Figure 1.

3.2.2 Caledonian Maritime Assets Limited

CMAL is the SHA and the owner of port infrastructure at the Railway Pier, ferry terminal and adjacent slipway. The harbour operations are managed under contract by CFL. CMAL is also the LLA with respect to aids to navigation by virtue of Section 193 of the Merchant Shipping Act 1995. The Act most relevant to CMAL's harbour at the Railway Pier is the 'Callander and Oban Railway Act 1878' which approved the Railway Pier works and gave the power to appoint a Harbour Master. The 'Scottish Transport Group (Oban Quay) Order Confirmation Act 1973' enabled extensive harbour works, extended the limits and incorporated provisions of the Harbours, Docks and Piers Clauses Act 1847. The following Acts and Orders are relevant:

- General Harbour Orders Act 1861.
- The Oban Piers and Harbour Order 1862.
- Various Railway Acts 1862-1878.
- Callander and Oban Railway Act 1878.
- The Oban Piers Order 1896.
- Callander and Oban Railway Act 1897.
- Scottish Transport Group (Oban Quay) Order Confirmation Act 1973.
- Scottish Transport Group (Oban Quay) Harbour Revision Order 1986.

3.3 Recreational facilities

There are two marinas located in Oban Bay, the first of these is Oban Marina and Yacht Services Ltd, which owns and operates a 150 vessel capacity pontoon/mooring facility located on the Island of Kerrera adjacent to the North Channel entrance to Oban Bay. The second is the North Pier Pontoons which provides a marina facility for transit yachts staying up to three nights. The pontoons provide 39 finger berths and berthing along its outer breakwater for vessel of 20 m or larger in length and up to 127 Gross Tonnage (GT). The pontoons are also used by tenders from Cruise vessels on scheduled visits.

There are a variety of recreational activities which take place in the waters of Oban Bay, including sailing, diving and kayaking. There are also several established watersports clubs in the area which host popular events. Oban Sailing Club runs training and racing sessions for dinghies, yachts and keelboats. These sessions mainly occur between April and September and include events such as the Round Mull Race. Oban Sea School focuses specifically on yachts, offering RYA training, charters and cruises. In addition to this, there are many independent recreational cruising yachts which pass through or stay at the marinas. The RYA has published data on the intensity of their activities, which is shown in Figure 5.

Sea kayakers regularly use Oban Bay. Oban Canoe Club runs regular sessions, which include sea trips in the bay and surrounding areas, with Sea Kayak Oban offering experience days and courses in the area. More experienced kayakers also partake in the annual race around the Island of Kerrera. This is a large event which had 42 finishers in 2022. Stand-Up Paddleboarding (SUP) is also become a popular activity in the bay, with a notable increase in use over the warmer summer months.

The Puffin Dive Centre offer a variety of diving opportunities both at wrecks and at shore locations. It is based within the Sound of Kerrera, on the water's edge at Gallanach.

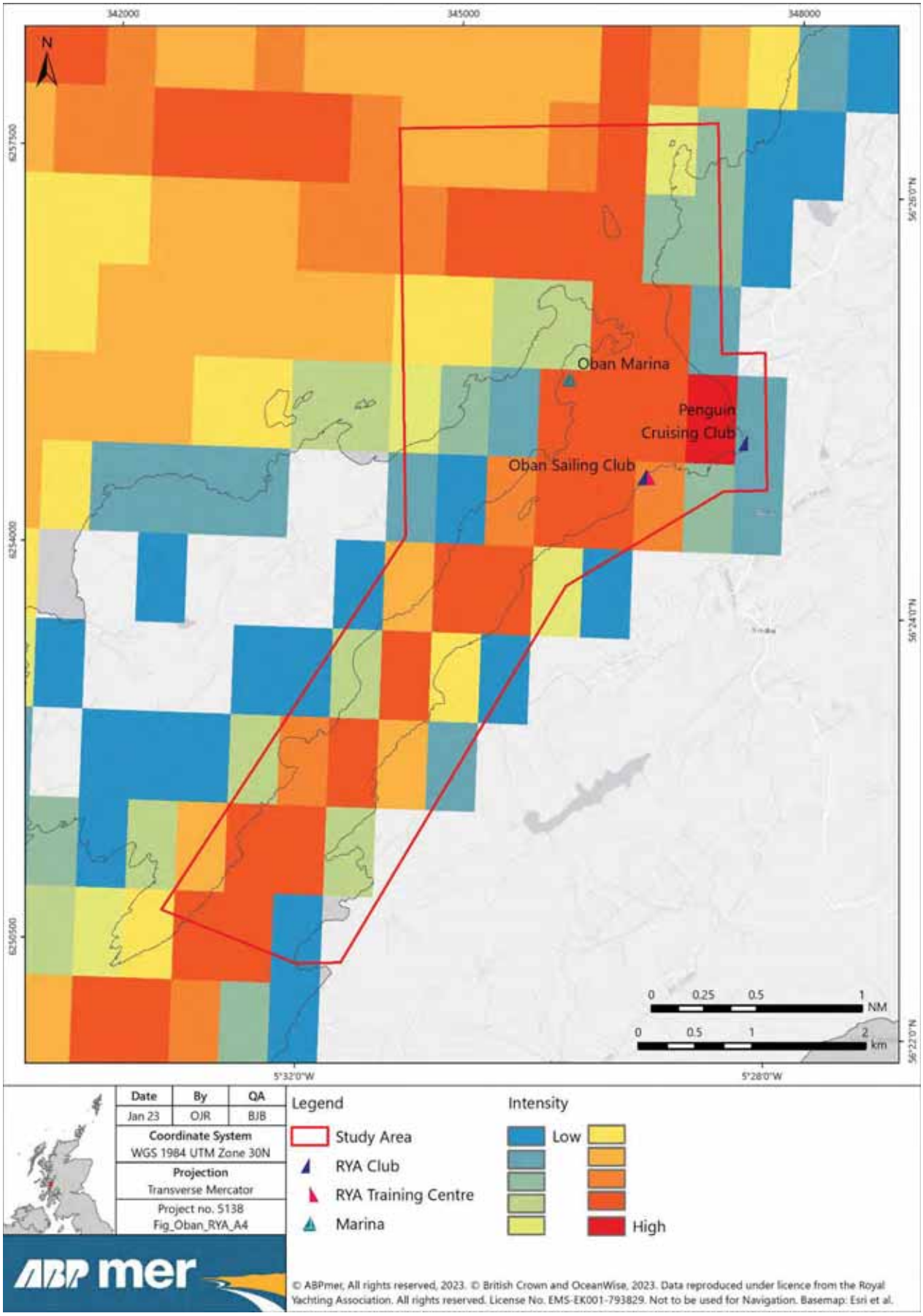

Figure 5. RYA activity intensity and marine facility locations

3.4 Fishing activities

There is a significant fishing community based in Oban. This includes aquaculture (fish farm craft), local commercial fishing boats, tour boat angling and recreational fishing. Local fish farms generate vessel activity in the bay with Scottish Sea Farms operating the Charlotte's Bay farm and Dunstaffnage farm. Crew Transfer Vessels (CTVs) take staff to workboats anchored in the bay for transfer to the farms, this creates an intensive period of activity in the bay at the beginning and end of each working day. The majority of locally based fishing vessels are Creel Fishermen, with fishing grounds in the local area. There is also a number of tour boat angling vessels offering daytrips, plus recreational fishing which is carried out independently.

3.5 Ferry Activities

Oban is an important ferry hub known as the 'Gateway to the Isles' with around 13,700 vessel movements recorded in 2019. Oban acts as the central point for west coast Roll-on, Roll-off (RoRo) lifeline ferry services with scheduled sailings to the Islands of Lismore, Colonsay, Coll, Tiree, Port Askaig (Islay), Craignure (Mull), Kennacraig, Castlebay (Barra) and Lochboisdale on South Uist. There are a large number of ferry transits through the Northern Channel as the principal route used into, and out of Oban Bay. CFL also run a ferry service from Gallanach, this is a lifeline ferry service providing access to and from the Island of Kerrera. The ferry assigned to this route is the 12 m length Motor Vessel (MV) *Carvoria* which came into service in July 2017. The vessel provides capacity for one vehicle and foot passengers. A small ferry also regularly travels between the North Pier slipway and Oban Marina on Kerrera.

3.6 Aids to Navigation

A range of Aids to Navigation (AtoN) are used within the study area. There are cardinal marker buoys located in the study area to mark the extent of navigational hazards, in this case the Ferry Rocks in the South Channel, the partially submerged rocks of Sgeir Rathaid in the bay itself. The extent of the Corran Ledge near the North Channel is indicated by starboard lateral marks. There are additional lateral marks in the study area which are used to indicate the safe passage to navigating vessels through the North and South Channels. Furthermore, there is a sectored light at Dunollie to aid with navigation through the North Channel from both the northern and southern direction. These lights indicate the correct angle of approach to stay within the channel and provide guidance to mariners navigating within Oban Bay and its approaches.

3.7 Metocean conditions

This section details the wind and wave characteristics of the study area, Figure 6 and Figure 7 are rose diagrams for waves and wind conditions prevalent in the area.

They are based on conditions 3.7 nautical miles to the west of Oban Bay, within the Firth of Lorn. From this information, an approximation of the conditions in the area can be noted. Oban Bay is significantly more sheltered due to the protection offered by the Isle of Kerrera. This is backed-up by weather observations during the vessel traffic surveys (ABPmer, 2023).

3.7.1 Waves

It can be seen from Figure 6 that the waves experienced are predominantly from the southwest. The waves do not exceed 0.25 m. The area is sheltered from most directions, with the small fetch not allowing waves to build up in height. The lowest concentration of waves is from the northeast and east.

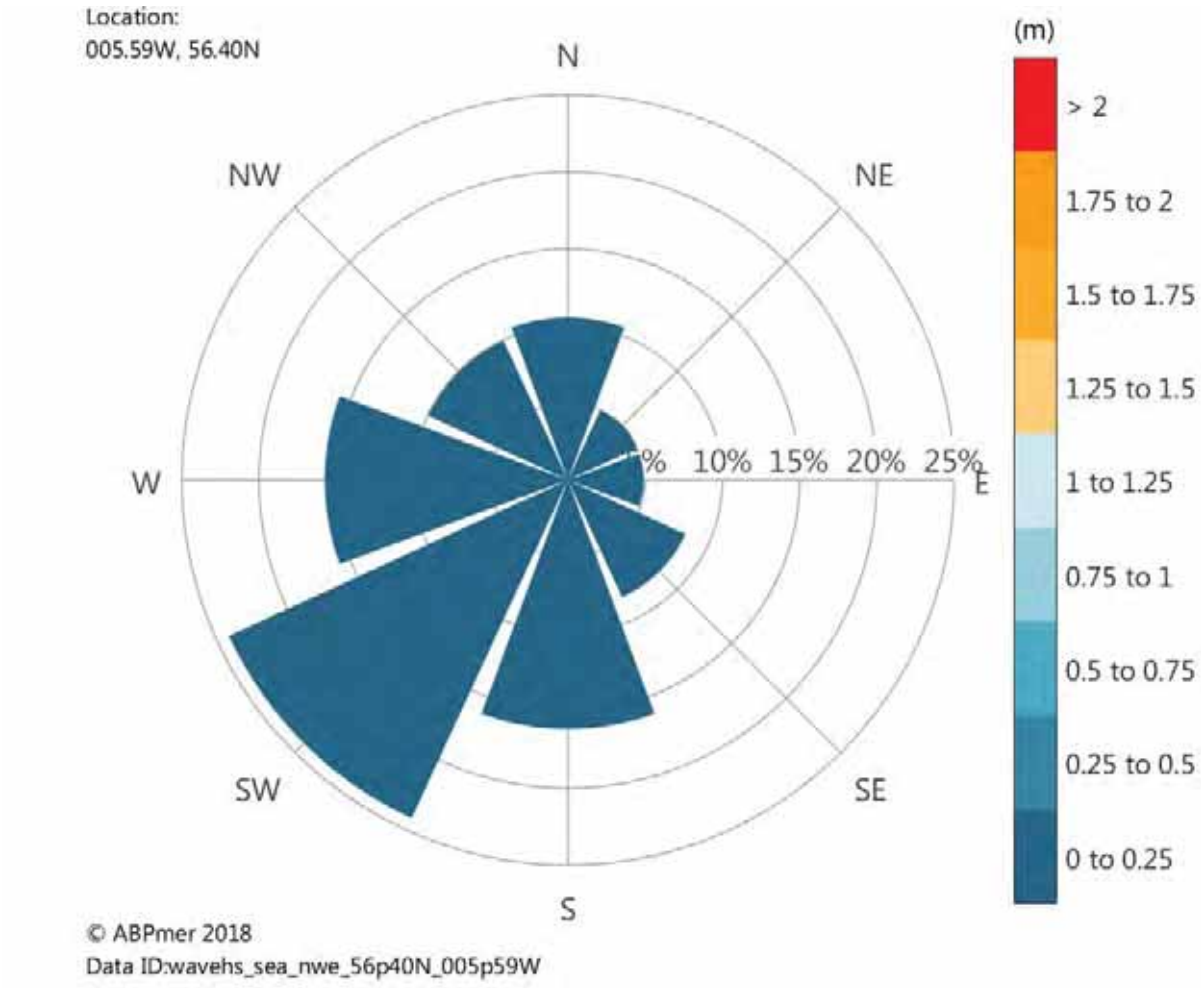

Figure 6. Wave rose for the Firth of Lorn

3.7.2 Wind conditions

Figure 7 identifies that the wind is predominantly from the south-west, west, and south. The strongest winds of greater than 16 m/s (Beaufort wind force 7) are also predominantly from the south-west and west. These wind speeds can be seen from all directions except north and northeast. It is far more common to have wind speeds of 6-8 m/s.

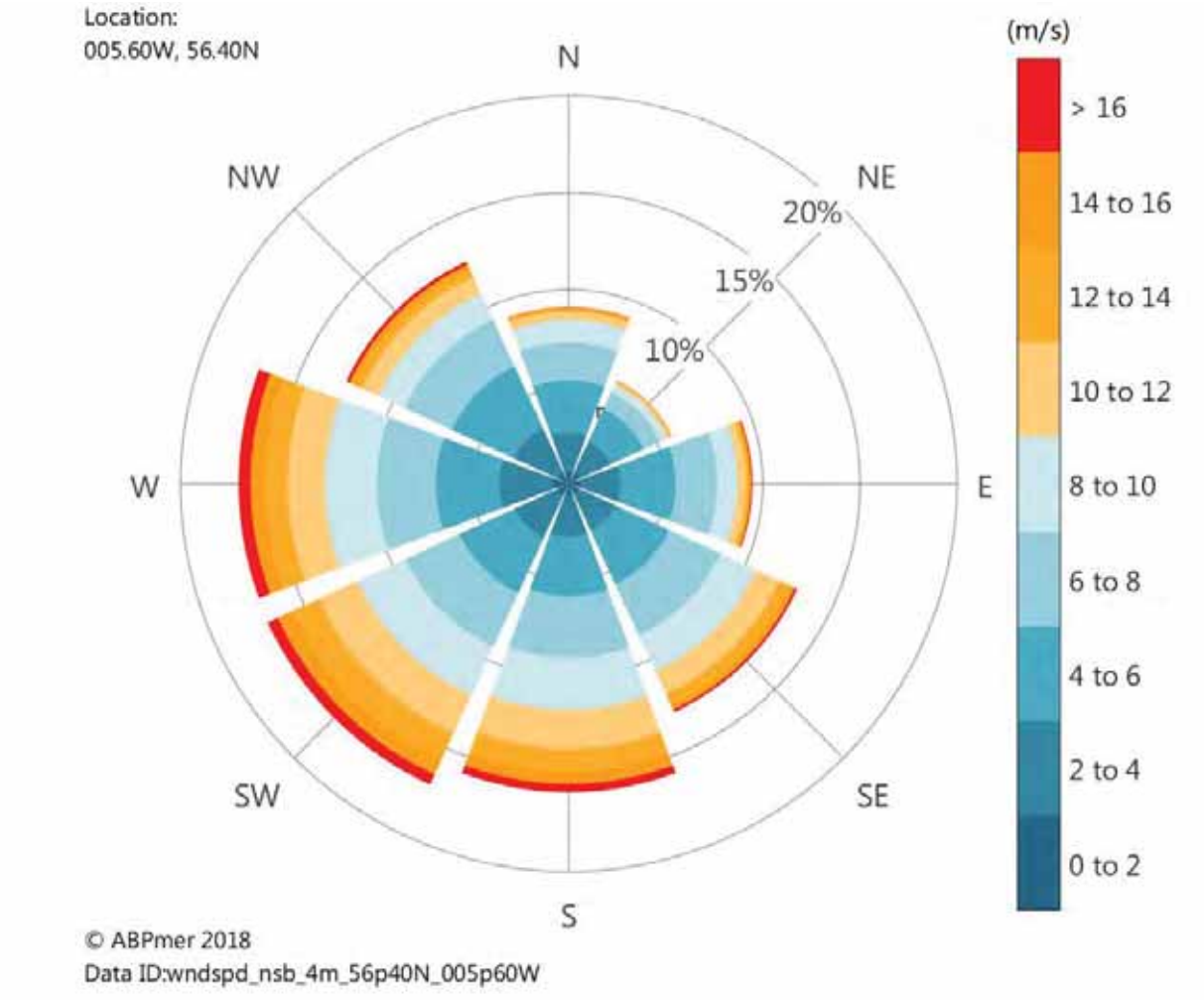

Figure 7. Wind rose for the Firth of Lorn

3.8 Emergency response

There are multiple organisations ensuring the safety of those at sea in the Oban area. The following organisations provide resources and assistance if a marine emergency occurs.

3.8.1 HM Coastguard

The MCA is responsible for the initiation and coordination of all civilian maritime search and rescue operations within the UK Maritime Search and Rescue Region. This includes the mobilisation, organisation and tasking of adequate resources to respond to persons in distress at sea, or to persons at risk of injury or death along the shoreline within the UK. HM Coastguard has access to a range of resources including aircraft and coastal search teams.

3.8.2 RNLI

There is a RNLI lifeboat station within the bay, based adjacent to the South Quay at the Port Beag slipway. The station has a volunteer crew which runs a Trent Class lifeboat, capable of 25 knots and a range of 250 nautical miles.

3.9 Marine incidents

This section reviews marine incidents that have occurred within the study area over a 13 year period. The analysis is intended to provide a general indication as to whether the study area is in an area of low or high risk in terms of marine incidents. Data from the MAIB and the RNLI has been obtained, covering the following timescale:

- MAIB: information includes accidents to ships and personnel reports to the MAIB from 2009 to 2021 inclusive.
- RNLI: complete dataset of all callouts from 2008 to 2020 inclusive.

Where possible, duplication of data has been removed (as the same incident may have been recorded by both organisations). The complete combined dataset has been presented spatially in Figure 8 for MAIB and Figure 9 for RNLI which are located in Appendix A.

Table 1 and Table 2 provide a compiled view of reported marine incidents within the study area identified by this document. The MAIB and RNLI record incidents slightly differently, and as such there are a different number of incident categories, with the MAIB having six and the RNLI having eight categories. The tables show that there are, on average, 1.85 MAIB and 6.14 RNLI recorded incidents per year. Both datasets identify that the most common incident type is ‘person in distress’, followed by ‘equipment failure (vessel)’. There were 38 counts of person in distress and 24 of equipment failure.

There have been a small number of MAIB recorded incidents over the past 10 years with an average of 1.85 incidents a year. Figure 8 shows that the majority of recorded incidents happened within the Oban Bay, though mostly outside of the current limits of the SHA’s referred to in Section 3.2 (see Figure 1 for approximation of SHA boundaries).

There are a number of incidents of ’persons in distress’ recorded. The definition of this category can cover a number of events such as injury or persons in the water. The majority of the person’s in distress are located within the Oban Bay area with five of the eight occurring on passenger vessels and the other three occurring on a variety of other vessels.

There were four incidents of 'grounding' recorded over the period. It is noted that the location of these incidents may not be exact, as Figure 8 indicates that two of the incidents occurred where there was a substantial depth of navigable water (it is likely that database record locations have been approximated or latitude/longitude values rounded). However, given the coastline and areas of shallows around Oban Bay, it is likely that these two incidents occurred relatively close to their denoted positions.

There were seven recorded incidents of vessels experiencing equipment failure, two of which occurred in Oban Bay, the rest of which occurred within the study area. Incidents within this category would relate to events such as vessel engine failure, mooring rope parting or steering gear failure.

There were two recorded collisions within Oban Bay, with a further collision having occurred towards the north west of the northern approach area.

Table 2 shows the number of incidents recorded by the RNLI, sorted into eight different categories. The locations of the incidents in Table 2 are plotted in Figure 9 and the vast majority of which can be seen to have occurred outside of the existing limits of the SHA's, but within the Oban Bay area. The rest of the incidents are fairly evenly dispersed along the Sound of Kerrara, and on the approach to the North Channel.

The category with the largest number of recorded incidents is person in distress which records 30 incidents and may include individuals sustaining injury or requiring aid from the RNLI or another responder. The majority of these incidents have been recorded in locations where there is shore access to the water, notably Oban Marina (on Kerrera) and the Railway Pier. Other incidents can be seen to have occurred at various slipways and jetties throughout the study area, and some are recorded as being in open water. Given the nature of this incident category they may not have all occurred in direct relation to the navigation of vessels, but rather where the RNLI attended an incident in close proximity to the shoreline.

The second most frequent incident is that of grounding with 20 recorded incidents at an average of 1.43 annually. There is a notable cluster of recorded groundings in the immediate vicinity of Sgeir Rathaid. Other areas where more than one grounding has been recorded include Corran Ledge, Ferry Rocks and the north side of Rubh 'a' Chruidh Island.

Equipment failures have been recorded throughout the study area, however there is a cluster around Maiden Island and at the southern entrance to Kerrera Sound.

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Table 1. MAIB marine incident summary for the study area (2009 to 2021)

Incident Category	Year														Annual Frequency
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	
Collision	0	0	0	0	1	1	0	1	0	0	0	0	0	3	0.23
Equipment failure (vessel)	1	0	0	0	0	0	0	2	1	0	1	1	1	7	0.54
Grounding	0	0	0	0	1	1	0	0	2	0	0	0	0	4	0.32
Impact with Structure	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.08
Leaks / Swamping	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0.08
Person in distress	0	0	0	1	0	0	2	2	0	0	0	1	2	8	0.62
Total	1	0	0	1	2	2	2	5	4	1	1	2	3	24	1.85

Table 2. RNLI marine incident summary for the study area (2008 to 2020)

Incident Category	Year													Annual Frequency
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total	
Collision	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0.07
Equipment failure (vessel)	1	1	5	0	2	0	2	3	0	2	1	0	0	17	1.21
Fire /Explosion	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0.07
Grounding	0	0	3	2	1	3	3	3	0	0	2	3	0	20	1.43
Leaks/Swamping	2	0	0	0	1	0	0	0	0	0	1	0	0	4	0.29
Other nautical safety	1	0	0	0	0	0	0	0	0	0	0	3	1	6	0.43
Person in distress	5	1	6	3	3	2	3	2	1	1	0	2	1	30	2.14
Person(s) in the water	0	0	2	1	3	0	1	0	0	0	0	0	0	7	0.5
Total	10	2	17	6	10	5	9	8	2	3	4	8	2	86	6.14

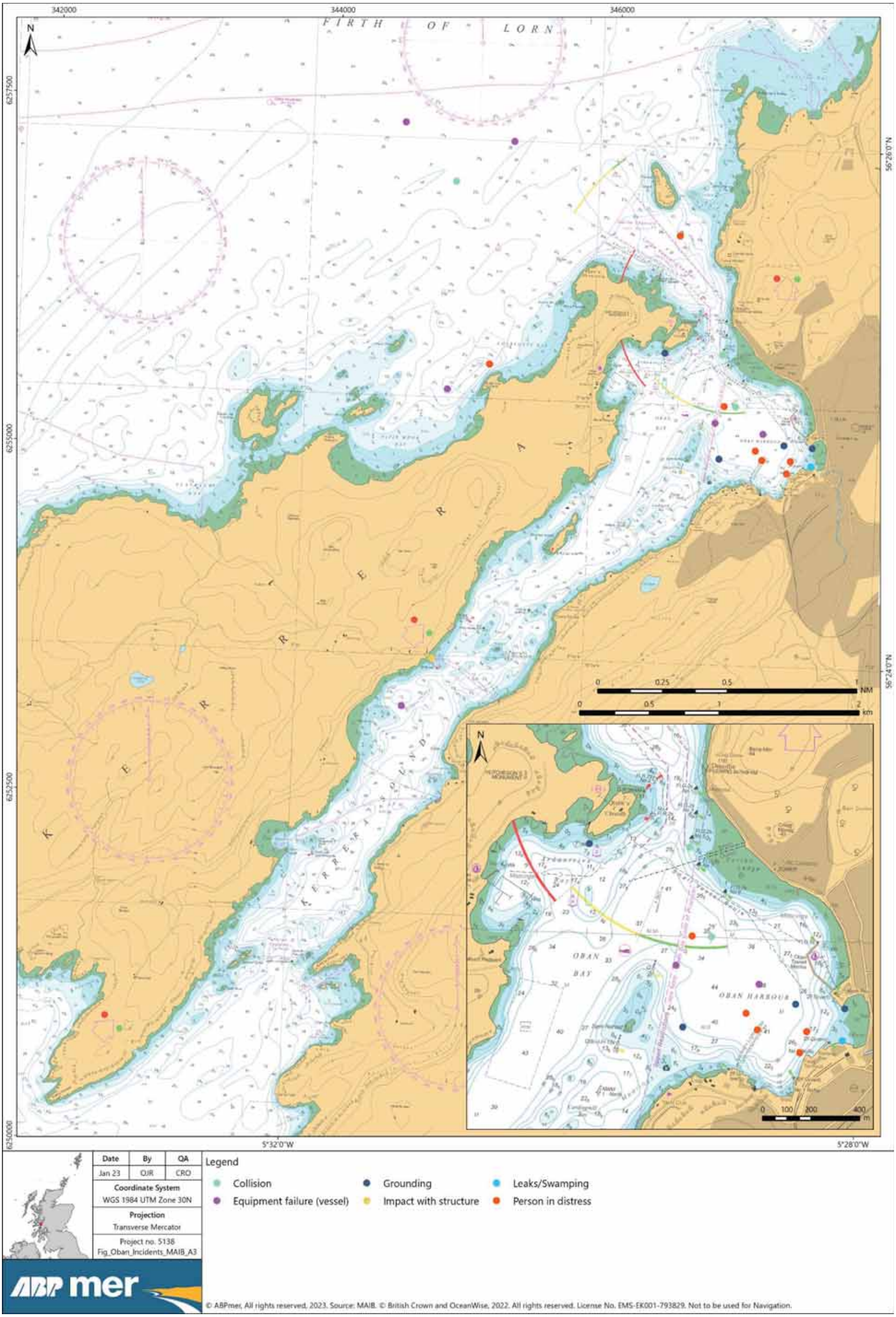

Figure 8. MAIB Accidents and Incidents by type

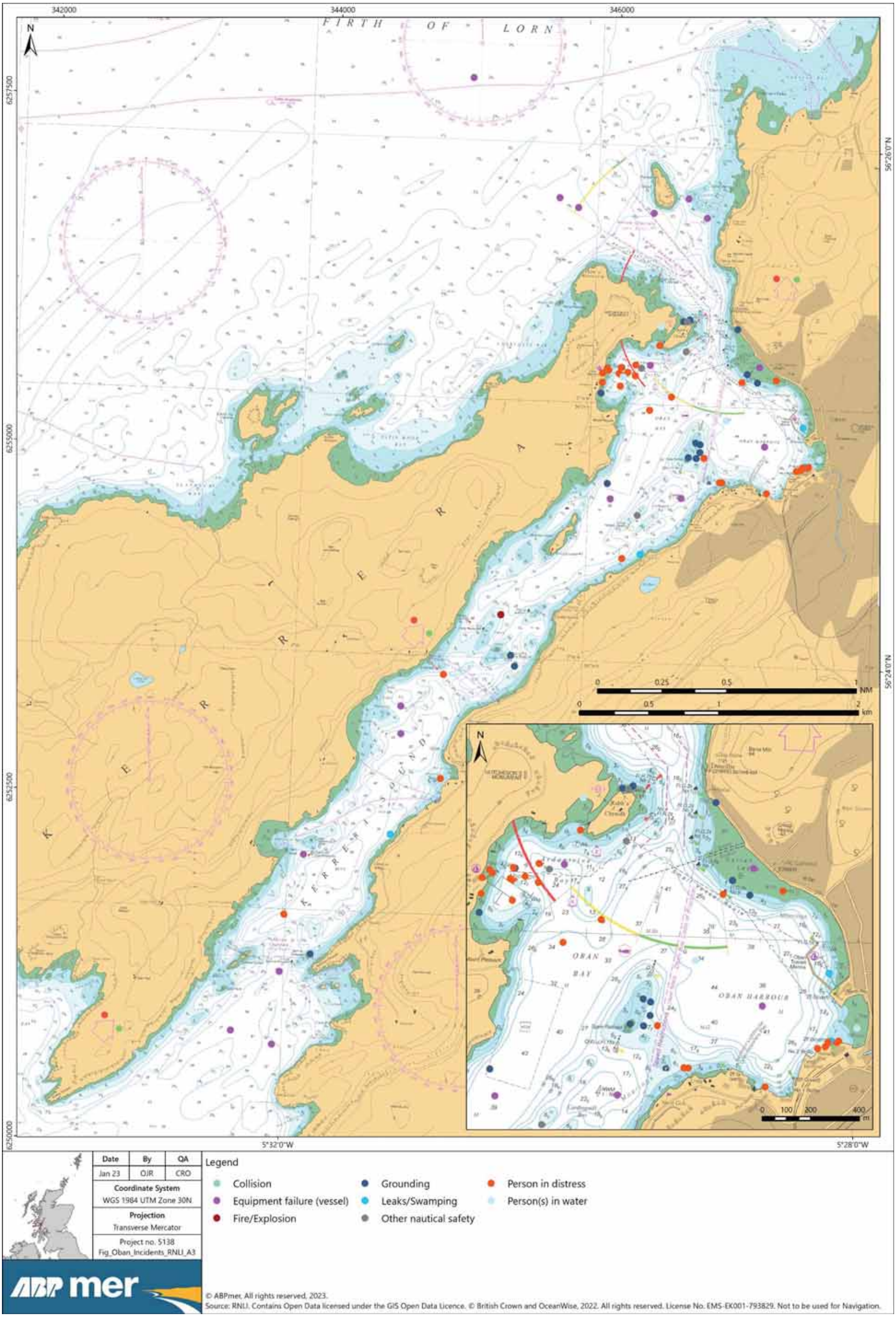

Figure 9. RNLI Accidents and Incidents by type

4 Marine Traffic Analysis

This section analyses the vessel traffic routeing through the study area. AIS data has been presented on a navigational chart with vessel activity data presented in Appendix B: Figure B1 to Figure B9 showing the AIS transits by type for both the busy period (July) and the quite period (January). Traffic density is presented in Figure B10. Non-AIS carriage vessels have been presented on a navigational chart with vessel activity data presented on Figure B11 to Figure B16. Traffic information is fully reported in the sperate ABPmer report, R.3974 'Vessel Traffic Monitoring, Oban Bay, its approaches and the Sound of Kerrera' (ABPmer, 2023).

4.1 Study area traffic

AIS and non-AIS data presented within this NRA is representative of 28 days of data collected in 2022, with two weeks (14 days) in a busy period (July 2022) and two weeks in a quiet period (December 2022). An overview of each period is provided in Figure B19 The following text provides a description of the vessel routeing based on the AIS information. Vessel transits through the study area are shown in through Figure B1 to Figure B19. There are a number of traffic features which characterise vessel movement, namely:

- Ferry routes entering and leaving Oban Bay via the North Channel, shown clearly in Figure B1. This splits into two parts, with some heading North beyond Maiden Island and most continuing in a north-westerly direction.
- Recreational vessels berth in Kerrara Marina and Oban North Pier Pontoons, using both the North and South Channels.
- Fishing vessels transiting from the South Pier. They mostly move through the South Channel, with a small number moving through the North Channel.
- Cargo Vessels operating from North Pier and the NLB quay, using both the North and South Channels.
- A small number of other vessels including law enforcement and dredging vessels.

Table 3 and Table 4 provides a count of the vessel transits in the study area for the two 14-day collection periods for AIS and Non-AIS respectively. Table 3 identifies that the most frequent vessel type in the study area is passenger vessels, constituting 52% of traffic, followed by recreational vessels at 34%.

Table 3. Vessel transits by ship type group in the study area (AIS)

Vessel Category	Jul (14 days)	Dec (14 days)	Total	% of Total
Unknown	20	5	25	2
Non-port Service Craft	0	4	4	0
Port Service Craft	51	9	60	5
Dredging or Underwater Operations	2	0	2	0
High Speed Craft	9	6	15	1
Military or Law Enforcement	2	0	2	0
Passenger	419	227	646	52
Cargo	40	20	60	5
Fishing	14	4	18	1
Recreational	421	0	421	34
Grand Total	978	275	1,253	100
* Vessel type 'unknown' is an AIS record which is not correctly transmitting its vessel type				
Data Source: Data is representative of 28 days of AIS-A and AIS-B data taken from the first 14 days of July and 14 days of December. See Section 2.4 for more information.				

Table 4. Vessel transits by ship type group in the study area (Non-AIS)

Boat type	Jul (14 days)	Dec (14 days)	Total	% of Total
Barge	1	0	1	0.03
Canoe	2	1	3	0.08
Dinghy	5	0	5	0.13
Ferry*	546	427	973	26.02
Fish farm workboat	166	195	361	9.65
Fishing	155	51	206	5.51
Jetski	11	1	12	0.32
Kayak	35	7	42	1.12
No boat	4	0	4	0.11
Other	1	0	1	0.03
Paddleboard	12	29	41	1.10
Powerboat	744	0	744	19.90
Rigid Inflatable Boats	485	24	509	13.61
Yacht	825	12	837	22.39
Grand Total	2,992	747	3,739	100.00

* Kerrera/Gallanach, Oban to Kerrera Marina, and local ferry operators with small craft not using AIS

From Table 4 it can be seen that the most frequent vessel type in the study area are local ferries vessels, constituting 26% of traffic, followed by yachts, which are 22%. The four records shown as 'no boat' accounts for four swimmers.

4.1.1 Vessel traffic Intersecting with the Transect A

Table 5 presents a count of the vessel transits in the North Entrance to Oban Bay. All vessels entering or leaving through the North Channel will have passed through this line.

Table 5. Vessel transits by ship type group in the North Entrance (AIS)

Vessel Category	Jul (14 days)	Dec (14 days)	Total	% of Total
Unknown	19	3	22	1.9
Non-port service	0	3	3	0.3
Port service	44	9	53	4.5
Dredging/underwater	2	0	2	0.2
High speed craft	8	3	11	0.9
Military/law	1	0	1	0.1
Passenger	406	240	646	54.5
Cargo	27	19	46	3.9
Fishing	3	3	6	0.5
Recreational	396	0	396	33.4
Grand Total	906	280	1,186	100.00

Data Source: Data is representative of 28 days of AIS-A and AIS-B data taken from the first 14 days of July and 14 days of December. See Section 2.4 for more information.

Table 5 shows that the most frequent vessel type in the study area is passenger vessels, constituting 54.5% of the measured traffic, followed by recreational vessels at 33.4%. All other categories constitute less than 5% each. There is a large difference in traffic between the July and December samples. The overall traffic drops by *circa* 70%, mostly from the reduction in recreational vessels, passenger vessels and port service craft.

4.1.2 Vessel traffic Intersecting with the Transect B

Table 6 presents a count of the vessel transits in the South Channel. This will count all vessels entering and leaving via this route.

Table 6. Vessel transits by ship type group in the South Entrance (AIS)

Vessel Category	Jul (14 days)	Dec (14 days)	Total	% of Total
Unknown	3	0	3	1.2
Non-port service	0	1	1	0.4
Port service	4	2	6	2.4
High speed craft	3	3	6	2.4
Passenger	15	5	20	7.8
Cargo	13	1	14	5.5
Fishing	7	2	9	3.5
Recreational	196	0	196	76.9
Grand Total	241	14	255	100

Data Source: Data is representative of 28 days of AIS-A and AIS-B data taken from the first 14 days of July and 14 days of December. See Section 2.4 for more information.

Recreational vessels make up over 77% of traffic through the South Channel. The passenger vessels make up 7.8% of transits and are predominantly the larger CFL ferries heading for the Railway Pier in Oban.

4.1.3 Vessel traffic Intersecting with the Transect C

The vessel transits intersecting with the mid-harbour point are presented in Table 7. Any vessels making use of Oban North Pier Pontoons, North Pier, South Pier, Railway Pier and other facilities in that area will cross this line.

Table 7. Vessel transits by ship type group in the Mid Harbour area (AIS)

Vessel Category	Jul (14 days)	Dec (14 days)	Total	% of Total
Unknown	20	5	25	2.0
Non-port service	0	4	4	0.3
Port service	51	9	60	4.8
Dredging/underwater	2	0	2	0.2
High speed craft	9	6	15	1.2
Military/law	2	0	2	0.2
Passenger	419	227	646	51.6
Cargo	40	20	60	4.8
Fishing	14	4	18	1.4
Recreational	421	0	421	33.6
Grand Total	978	275	1,253	100.00

Data Source: Data is representative of 28 days of AIS-A and AIS-B data taken from the first 14 days of July and 14 days of December. See Section 2.4 for more information.

From Table 7 it can be seen that the most frequent vessel type in the study area is passenger vessels, constituting 51.6% of traffic, followed by recreational vessels, which are 33.6%. All other categories make up a portion of less than 5% each. There is a large difference in traffic between the July and December samples. The overall traffic drops by over 70%, mostly from the drop in recreational vessels.

The following sections provide a description of each vessel type and its typical behaviour within the study area.

4.1.4 AIS – Passenger

The majority of passenger vessels carrying AIS are associated with CFL services using Oban Bay Railway Pier and adjacent slipway. The predominant route for entering and leaving Oban is the North Channel, with accessional vessel routes using the Sound of Kerrera. See Figure B1 for passenger transits from 2022.

4.1.5 AIS – Recreational

There is a very high density of recreational vessels throughout the study area, with concentrations of craft around berthing areas. Recreational vessels actively use Kerrera Marina and Oban North Pier Pontoons. There is also a lot of cross-bay traffic between the two marinas. In addition to using the marinas, vessels moor at moorings off Heather Island and by the sailing club and anchor in Oitir mhòr Bay. Vessels enter the North Channel from all directions, but mainly from north east and north west. Some pass between Maiden Island and the shore whilst approaching. Heading out via the South Channel, vessels travel tight to the shallow water marked by cardinal marks. Vessel transits are seen on either side of the obstruction. Once in the South Channel the majority of vessels pass to the north of Ferry Rocks, with occasional transits to the south. See Figure B2 for recreational transit routes.

4.1.6 AIS – Port service

Port service craft operate from the Port Beag slipway and North Pier Pontoons, with routes through the North and South Channels. Outside of the North Channel there is a widespread use of the sea area between Maiden Island and the shore. Vessels can be seen travelling around and stopping within Charlottes Bay. See Figure B3.

4.1.7 AIS – Fishing

Fishing vessels predominantly use the South Channel as shown in Figure B4. They operate from the South Pier and depart Oban Harbour by sailing either side of the obstruction shown by cardinal marks in the Bay. A smaller portion of fishing vessels exit the bay using the North Channel and generally proceed in a north westerly direction into the Firth of Lorn.

4.1.8 AIS – Cargo

Figure B5 shows Cargo vessels operating from North Pier and the NLB's quay. They travel via both the North and South Channels. The majority of vessels using North Pier favour the North Channel and those using the NLB Quay tend to use the South Channel. A small portion of cargo craft after leaving Oban Bay got to the north side of Kerrera and in the direction of the fish farms.

4.1.9 AIS – Dredging, high speed craft, and military/law enforcement

These three vessel types are grouped together in Figure B6. There are High Speed Craft moving through both the North and South Channels. Some come from Oban North Pier Pontoons, the rest from near the Railway Pier. The single military/law vessel can be noted with a transit through the South Channel.

4.1.10 Non-AIS – Tour boats

Tour boats operate from Oban Pier Pontoons, North Pier, and Railway Pier. Figure B14 shows that they predominantly use the North Channel and typically head west after exiting the channel. Some travel through the South Channel, with vessels travelling on both sides of Heather Island. This is reduced in the winter to a small number of transits all launching from the Oban Times Slipway.

4.1.11 Non-AIS – Yachting

Figure B15 shows yachts using Oban Pier Pontoons and Kerrera Marina. The tracks mainly consist of yachts travelling between these marinas or moving through the North and South Channel. The North Channel and Oban Transit Marina have the highest traffic densities. During the winter survey this was reduced to almost nothing, with only a few tracks being recorded.

4.1.12 Non-AIS – Ferries

Ferries, as shown in Figure B16, travel between North Pier and Oban Pier Pontoons and Kerrera Marina. They also use the North Channel frequently and to a far lesser extent the South Channel. A short ferry route can be identified in the South Channel where a small ferry travels to the Island of Kerrera. This route has an intensity of use due to the regular schedule and short crossing distance.

4.1.13 Non-AIS – Powerboating

Many powerboating vessels operate out of the Oban North Pier Pontoons transit marina. They travel from there to the anchorages near Oban Kerrera Marina and to a lesser extent, Heather Island. There is significant use of landing points along the coastline, with vessels making use of many slipways and jetties around the yacht club, Port Beag, all the way through to Oban Times slipway. The vessels often travel between Kerrera Island and the mainland. On Kerrera Mount Pleasant and Oban Marina are the main destinations. There is a large volume of traffic through the North and South Channels, though the South Channel is less used less frequently in the Winter.

4.1.14 Vessel traffic comparison summer to winter

Figure B19 shows the overall traffic over the course of both the summer and winter observations. It is clear from the figure that the traffic patterns for each vessel type is the same, however summer brings a far larger volume of traffic. This is most pronounced for recreational vessels.

5 Future Traffic

5.1 Predictive Factors

As a general global trend vessel traffic increases over time due to the increase of population leading to higher demand. This can be expected to cause a small increase in vessel numbers. The use of AIS transponders by vessels for which it is not obligatory is gradually increasing (particularly for yachts), which leads to a greater amount of AIS data being collected. This improvement in data collection may give a false impression as to the level of increasing traffic, unless non-AIS equipped vessel numbers are taken into account as per this NRA.

Local port operators, including A&BC, CFL, the NLB and Kerrera Marina were contacted as stakeholders during the HRO and NRA process. There were no planned developments that would significantly alter vessel traffic for the study area.

The Marine Scotland marine licencing database contains six applications for fish farm licenses in the surrounding area. One proposal is in the Sound of Mull, two are in Loch Melfort and three in the direction of Loch Linnhe. None are in the direct vicinity of the Study Area; however, they will lead to an increase in aquaculture vessels across the region. This includes maintenance work boats, well vessels, feeding vessels and crew transfer vessels.

5.2 AIS data comparison

To compare the change in vessel traffic the data from a previous NRA undertaken in 2014 (ABPmer, 2014) is compared to the recently collect AIS data in 2021. Table 8 shows the more recently collected data from 2022. Both transit counts have been taken from the North Channel and provided a calculation to uplift the recorded data period to provide an estimated yearly figure.

Table 8. AIS vessel transits by type 2014

Vessel Type	Transit Count 42-Day AIS Record	Yearly Uplift	% of Total
Unknown (type could not be identified)	20	174	2.1
Non-Port service craft	1	9	0.1
Port service craft	2	17	0.2
Dredging/underwater	18	156	1.9
Passenger vessels	795	6,909	84.8
Cargo vessels	27	235	2.9
Fishing	12	104	1.3
Sailing and Pleasure craft (Recreation)	62	539	6.6
Total	937	8,143	100

The 2014 data identifies that there were 937 transits within the observation period which gives an estimated yearly count of 8,143. The most prominent vessel usage in the area is passenger vessels with 84.8% of transits and an estimated yearly transit count of 6,909. The next most frequent user is sailing and pleasure craft which account for 6.6% of the traffic and an estimated yearly count of 539.

Table 9. AIS vessel transits by type – North Entrance: Summer and Winter 2022

Vessel Category	Total	Yearly Uplift	% of Total
Unknown	22	287	1.9
Non-port service	3	39	0.3
Port service	53	691	4.5
Dredging/underwater	2	26	0.2
High speed craft	11	143	0.9
Military/law	1	13	0.1
Passenger	646	8,421	54.5
Cargo	46	600	3.9
Fishing	6	78	0.5
Recreational	396	5,162	33.4
Grand Total	1,186	15,460	100

In 2022 there has been a 1,186 vessel transits which provide an estimated yearly transit count of 15,460. The most frequent vessel type in 2022 was passenger which account for 54.5% of traffic with an estimated yearly count of 8,421. The second highest vessel transit is recreational craft with 33.4% of transits and an estimated yearly count of 5,162 transits.

As it can be seen from the two data sets there has been an uplift in vessel activity by 7,317 transits a year which equates to a 189.86% increase in recorded transits. For ferry traffic an increase of 1,512 (121.89%) of vessel moves a year has been observed which is directly comparable as the requirement for these vessels to carry AIS has remain consistent.

The rise in recreational activity in the period has seen an increase of 4,623 transits which is a 958.06% increase between the two periods. A proportion of this increase could be attributed to recreational vessel increasing in size and the availability of cheaper AIS equipment entering the market directed to recreational vessels promoting safety. However, the newly built transit marina would have prompted a greater number of recreational craft to come to the area with additional moorings and services provided.

5.3 Predictions

From the AIS data the ferry traffic can be used to produce an estimated uplift of traffic year on year as they have been required to have AIS. From the data identified in Section 5.2 and an 8-year gap between the two dates suggests a two-year increase in vessel traffic of 2% a year. Table 10 below shows a predicted yearly increase in traffic using this figure projected forwarded for all vessel types.

Table 10. Prediction for vessel traffic increase

Vessel Category	Year								
	2022	2023	2024	2025	2026	2027	2028	2029	2030
Unknown	287	293	298	304	310	317	323	329	336
Ferry Traffic	39	40	41	42	42	43	44	45	46
Port service	691	705	719	733	748	763	778	794	809
Dredging/underwater	26	27	27	28	28	29	29	30	31
High speed craft	143	146	149	152	155	158	161	165	168
Military/law	13	13	14	14	14	14	15	15	15
Passenger	8,421	8,589	8,761	8,937	9,115	9,298	9,483	9,673	9,867
Cargo	600	612	624	636	649	662	675	689	703
Fishing	78	80	81	83	85	86	88	90	2
Recreational	5,162	5,265	5,371	5,478	5,588	5,699	5,813	5,930	6,048
Grand Total	15,460	15,770	16,085	16,407	16,735	17,069	17,411	17,759	18,114

6 Stakeholder Consultation

During the marine traffic survey conducted in July 2022, consultation with local stakeholders was carried out to understand marine traffic use of the study area. This also provided an opportunity for stakeholders to raise any issues or potential conflicts with marine operations within the bay. In addition, consultees provided anecdotal information regarding marine activity in the study area, which enhanced the level of detail collected through the navigation baseline activities. The following list presents the organisations which were invited to provide consultation feedback:

- CalMac;
- Kerrera Marina;
- Oban Community Berthing;
- Sea Kayak Oban;
- Argyll Sea Tours;
- Oban Sea Tours;
- Hebridean Island Cruises;
- Hebrides Cruises;
- Inverlussa Marine;
- Majestic Line;
- Oban Sailing Club;
- Scottish Salmon Company;
- RNLI;
- Migdale Transport;
- North West Marine;
- Ocean Farm Services;
- Coastal Connections;
- Scottish Sea Farms; and
- Fergusson Shipping.

In addition to the consultation carried out during the traffic survey, separate consultation was carried out as part of creating the NRA.

6.1 HAZID consultation

To assess navigational risk, all marine operations which take place in the existing A&BC harbour areas, plus the proposed harbour area included in the HRO application have been considered through a Hazard Identification workshop (HAZID).

The HAZID was carried out onsite in Oban with a stakeholder group drawn from the local port community. The HAZID workshop was carried out 27 September 2022. Following the workshop, the resultant risk assessments were compiled and circulated to attendees. The feedback received from the consultations has been documented and is presented in Appendix D.

As the competent authority for marine safety, the MCA has been consulted in respect of the marine traffic data collection. In addition, in its capacity as the General Lighthouse Authority, the Northern Lighthouse Board (NLB) has been consulted by A&BC during the HRO process.

7 Navigational Risk Assessment

This NRA has been carried out to determine the navigational risks for all marine activity, associated with the A&BC existing and proposed harbour area limits.

The process for carrying out an NRA follows the method outlined in the PMSC 'Guide to Good Practice' (DfT, 2018), Section 4.0 'Risk Assessment'. The following steps have been carried out:

1. Identification of hazard definitions and scenarios (i.e. descriptions of hazard and outcome).
2. Risk analysis, including identification of causes that may lead to one of the described hazard scenarios (i.e. an accident or incident outcome).
3. Consideration of existing (embedded) mitigation measures, which either control or address the outcome of an accident or incident.
4. Additional (future) risk controls, which are not currently in place, but could be used to further reduce or eliminate risk.

The following sections identify the outcomes from the above steps.

7.1 Hazard definitions and scenarios

The first step in the NRA process is the consideration of potential hazards resulting from the proposed scheme. Table 11 provides hazard category drawn from A&BC MARNIS risk management system used to create, review and store marine/navigational risk assessments. The hazard definitions are common to all ports, harbours and piers in the A&BC marine facility portfolio.

Table 11. Hazard category definitions

Category	Description
Air Pollution	Pollution to the air from vessels within the port, including release of gas cargoes and Emissions from vessel exhausts.
Accident to personnel	Accidents which cause harm to any person onboard a vessel, pontoon or quayside, including stevedores; which do not arise as a result of one of the other accident categories. This includes drowning (or near drowning), asphyxiation, exposed to, or contact with harmful substances, temperature or bio-hazards.
Capsize/Sinking	Capsizing/Listing is a casualty where the vessel no longer floats in the right-side-up mode due to; negative initial stability (negative metacentric height), or transversal shift of the centre of gravity, or the impact of external forces.
Collision	A casualty caused by a vessel striking or being struck by another vessel, regardless of whether the vessels are underway, anchored or moored. This type of casualty event does not include vessels striking underwater wrecks. The collision can be with another vessel, or multiple vessels or vessels not underway.
Contact with floating object	Vessel striking or being struck by an external floating object (such as debris) or a floating anchored object (such as a buoy).
Contact with structure	Vessel striking or being struck by an external object (i.e. dock, jetty, crane etc) but not the sea bottom.

Category	Description
Fire/Explosion	An uncontrolled ignition of flammable chemicals or other material on board a vessel.
Flooding/Foundering	Flooding/foundering is a casualty event when the vessel is taking water on board. Foundering will be considered when the vessel has sunk.
Grounding	A moving vessel, either under command, or not under command, striking the sea bottom, shore or underwater wreck.
Marine Pollution	Pollution to the water from vessels or shoreside sources.
Mooring Failure	The movement of a vessel relative to its berth, due to disturbance cause by environmental conditions and/or a passing vessel.
Other	Any category not listed.

7.1.1 Hazard scenarios

The workshop attendees at the HAZID discussed the hazard categories and identified specific hazard scenarios (listed in Table 12) which relate to the proposed harbour area. In total, 37 hazard scenarios were identified through the HAZID.

Table 12. Harbour operational hazard scenarios

Assessment Number	Hazard Category	Hazard Scenario Title
1	Air Pollution	Air Pollution
2	Accident to personnel	Recreational diving incident
3	Accident to personnel	Person in distress in the water
4	Accident to personnel	Commercial diver in water whilst vessel manoeuvring in the vicinity
5	Accident to personnel	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a scallop diver
6	Capsize/Sinking	Small vessel (yacht/RIB/Powerboat/paddle craft) swamped
7	Collision	Paddle craft with powered recreational craft (yacht/RIB/Powerboat)
8	Collision	Recreational (power or sail) craft with large vessel (ferry, cruise, cargo, large fishing)
9	Collision	Recreational vessel (yacht/RIB/Powerboat/paddle craft) with fishing
10	Collision	Sailing vessel with other sailing vessel
11	Collision	Impact with moored vessels
12	Collision	Seaplane (landing) collision with large vessel (ferry, cruise, cargo, large fishing)
13	Collision	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/paddle craft)
14	Collision	Seaplane collides with vessel whilst taxiing
15	Collision	Seaplane (on take-off) collides with large vessel at speed
16	Collision	Seaplane (on take-off) collides with small vessel (yacht/RIB/Powerboat/kayak) at speed.
17	Collision	Seaplane strikes submerged/semi submerged object

Assessment Number	Hazard Category	Hazard Scenario Title
18	Collision	Jet skis at speed in harbour collision with another vessel or swimmer
19	Collision	Sailing events and club activities
20	Collision	Tendering operation from anchored cruise vessel to shore disembarkation location,
21	Collision	Small craft (not yacht) collision with commercial vessel
22	Collision	Two commercial vessels collide
23	Contact with floating object	Fast craft in contact with buoy
24	Contact with structure	Large vessel (ferry, cruise, cargo, large fishing) vessel contact with North Pier/NLB Pier
25	Fire/Explosion	Fire on commercial vessel alongside
26	Fire/Explosion	Fire on recreational/fishing vessel
27	Flooding/Foundering	Vessel sinks within harbour
28	Grounding	Large vessel (ferry, cruise, cargo, large fishing) grounds
29	Grounding	Recreational craft (yacht/RIB/Powerboat/paddle craft) or fishing craft grounds
30	Marine Pollution	Marine pollution from bunkering spill, marine incident or deliberate act
31	Marine Pollution	Marine pollution from environment run off
32	Mooring Failure	Mooring failure
33	Other	Wash affecting moored vessels
34	Other	Inflatable craft blown offshore
35	Other	Large Cruise vessel at anchor in Oban Bay drags its anchor
36	Other	Helicopter blade strike with vessel superstructure on take-off/landing
37	Other	Small vessel gets entangled in creel pot's lines

The hazard scenarios identified in Table 12 have been considered according to their 'Most Likely' and 'Worst Credible' outcomes. This provides the option to consider very serious outcomes, which could credibly occur, along with outcomes that are less serious, but could occur on a more frequent basis. The full working and outcome description of each scenario, presented as a full NRA, is provided in table format in Appendix C.

7.2 Risk analysis

The assessment of risk is based upon the descriptions of the 'Most Likely' and 'Worst Credible' to determine the outcome in respect of effect to people, property, the environment and port business. This approach follows the best practice guidance from the PMSC 'Guide to Good Practice' (DfT, 2018). In making the assessment the outcome from each scenario, using the receptors of 'people, property, environment and port' was evaluated to give a baseline risk with no mitigation measures in place.

7.2.1 Hazard scenario causes

Each hazard scenario was considered to determine its possible causes both individually, or in combination. Table 13 give a frequency (count) of the causes identified during the assessment process for the whole of the proposed harbour area.

Table 13. Cause frequency for harbour operations

Cause	Frequency
Adverse weather conditions	32
Human error/fatigue - Ship Personnel	31
Inadequate training / competence - Others	31
Human error	29
Inadequate procedures in place onboard vessel	27
Inadequate bridge resource management	25
Lack of awareness	23
Communication failure - Personnel	21
Restricted visibility	21
Failure to follow passage plan	17
Inadequate maintenance / inspection	17
High traffic density	16
Incapacitated master (drinks/drugs)	16
Competence	16
Vessel breakdown or malfunction	15
Communication failure - equipment	15
No enforceable Byelaws/Harbour Direction/Local Regulation	14
Malicious action by external parties	14
Excessive vessel speed	13
Lack of visibility of craft/persons	13
Lack of enforceable speed restrictions	13
Risk Assessment, Incomplete / not reviewed	12
Communication failure - operational/procedural	11
Incorrect assessment of tidal flow	10
Vessel has unreported defect	9
Unplanned interaction with recreational craft	9
COLREGS failure to comply	9
Unsuitable ship design	9
Deliberate action taken by external parties	9
Failure to comply with Standard Operating Procedures	8
Inappropriate manning of vessels	8
Loss of watertight integrity	7
Loss of vessels stability (due to other than loss of watertight integrity)	7
Vessel obstructing fairway	6
Inadequate procedures shoreside	6
Inadequate procedures on seaplane	6
Failure of Aid to Navigation (out of position/unlit)	5
Light pollution (backscatter)	4
Special Directions failure to follow / No power to give Special Directions	4
Bridge ergonomics (poor bridge layout)	4
Ship arriving before POB time/launch arrives late	3
Interaction	3
Notice to Mariners failure to observe	3
Derelict/Abandoned vessel	3
Human error/fatigue - Port/Marine Personnel	2
Fire/Explosion	2
Vessel Ramps or Hatches not secure	2

Cause	Frequency
AIS failure	2
Floating objects e.g. creel markers	2
Human error/fatigue - LPS Personnel	1
Anchored vessel represents a hazard	1
Inaccurate vessel details provided	1
Vessel fails to notify hazardous cargo	1
Unexpected shoaling	1
Failure of berth mooring systems	1
Designated berth unavailable	1
Illegal discharges into the water	1
Port Equipment (inc. craft) mechanical breakdown/control system malfunction	1
Inland pollution run off	1
Factors causing excess strain on moorings	1
Corrosion of mooring chains leading to failure	1
Vessel structural failures	1
Mental health issues	1
Inadequate procedures on helicopter	1
Use of low grade fuel	1

The most frequently identified causes is ‘Adverse Weather conditions’ with a frequency of 32, this is reflective of stakeholder experience suggesting that weather conditions can provide challenging navigational conditions in the study area. The second most frequently selected causes factor is ‘Human error/fatigue’ of ship’s personnel, and ‘Inadequate training / competence of others’.

7.3 Existing (embedded) risk controls

Each hazard scenario has been considered in light of embedded risk controls. It should be noted that embedded risk controls, in the context of marine safety, relate to processes, practices and available safety resources that are currently implemented. For example, these might include international regulations (such as the International Regulations for Preventing Collisions at Sea (COLREGS) (IMO, 1972), or search and rescue provision (such as the UK Coastguard service or RNLI). Table 14 present the embedded risk controls with a frequency count of the number of assessments to which they apply to.

Table 14. Embedded risk controls for harbour operations

Control	Frequency
Contingency plan exercises	35
Council Emergency Plan (Local)	35
RNLI	31
Communications - traffic broadcast	28
Oil spill contingency plans	25
Training of pollution response personnel	24
Availability of pollution response equipment	23
Voluntary code for safe navigation	21
Passage planning	19
International COLREGS 1972 (as amended)	18
Tier 2 contractor	16
Direction (Special) - Powers of Harbour/Pier Master	13

Control	Frequency
Harbour website	9
CCTV Coverage	8
Education (harbour community information)	7
Safety Management System	6
Vessel safety management system (ISM code)	5
Aids to navigation, Provision & maintenance of	4
Emergency services equipment - shore side	4
Marine Safety Management System	4
Standards of Training, Certification and Watchkeeping for Seafarers (STCW)	4
Operator/Facility Controls	4
Availability of latest hydrographic information	2
Civil Contingency Plan	2
Communications - Stakeholder	2
Harbour patrol	2
Sailing Club's Controls	2
Bunkering areas, restricted	1
Communications equipment	1
Pre-bunkering checklist	1
Protective Fendering	1
Shore side facility maintenance programme	1
Training of port marine/operations personnel	1
Vessel maintenance	1
Suitable equipment used	1
Mooring buoy maintenance	1
Other harbour users/vessels	1
Cruise vessel guidance	1
HSPV Voluntary Code of Practice	1
Dive Permits	1
Emergency services equipment - personnel	1

7.3.1 Risk evaluation: embedded controls

After determining which controls are applicable to each hazard scenario, an embedded risk score (shown as current risk). Table 15 show the hazard scenarios ranked by current risk after embedded risk controls have been considered.

Table 15. Ranked hazard scenarios

Hazard Category	Hazard Scenario	Baseline Risk	Current Risk
Marine Pollution	Marine pollution from bunkering spill, marine incident or deliberate act	Hig	Hig
Collision	Two commercial vessels collide	Vhi	Hig
Collision	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/paddle craft)	Vhi	Sig
Collision	Recreational (power or sail) craft with large vessel (ferry, cruise, cargo, large fishing)	Vhi	Sig

Hazard Category	Hazard Scenario	Baseline Risk	Current Risk
Fire/Explosion	Fire on commercial vessel alongside	Sig	Sig
Collision	Tendering operation from anchored cruise vessel to shore disembarkation location	Vhi	Sig
Other	Helicopter blade strike with vessel superstructure on take-off/landing	Sig	Sig
Marine Pollution	Marine pollution from environment run off	Hig	Sig
Other	Small vessel gets entangled in creel pot's lines	Sig	Sig
Air Pollution	Air Pollution	Sig	Sig
Accident to personnel	Recreational diving incident	Sig	Sig
Collision	Sailing events and club activities	Vhi	Mod
Collision	Paddle craft with powered recreational craft (yacht/RIB/Powerboat)	Hig	Mod
Collision	Small craft (not yacht) collision with commercial vessel	Vhi	Mod
Contact with floating object	Fast craft in contact with buoy	Mod	Mod
Collision	Jet skis at speed in harbour collision with another vessel or swimmer	Vhi	Mod
Collision	Recreational vessel (yacht/RIB/Powerboat/paddle craft) with fishing	Vhi	Mod
Flooding/Foundering	Vessel sinks within harbour	Hig	Mod
Grounding	Recreational craft (yacht/RIB/Powerboat/paddle craft) or fishing craft grounds	Sig	Mod
Capsize/Sinking	Small vessel (yacht/RIB/Powerboat/paddle craft) swamped	Mod	Mod
Collision	Seaplane (on take-off) collides with small vessel (yacht/RIB/Powerboat/kayak) at speed	Hig	Mod
Grounding	Large vessel (ferry, cruise, cargo, large fishing) grounds	Mod	Mod
Collision	Seaplane (landing) collision with large vessel (ferry, cruise, cargo, large fishing)	Hig	Mod
Collision	Seaplane (on take-off) collides with large vessel at speed	Hig	Mod
Collision	Seaplane strikes submerged/semi submerged object	Mod	Mod
Fire/Explosion	Fire on recreational/fishing vessel	Mod	Mod
Other	Inflatable craft blown offshore	Sig	Mod
Collision	Sailing vessel with other sailing vessel	Hig	Mod

Hazard Category	Hazard Scenario	Baseline Risk	Current Risk
Contact with structure	Large vessel (ferry, cruise, cargo, large fishing) vessel contact with North Pier/NLB Pier	Mod	Mod
Other	Wash affecting moored vessels	Sig	Mod
Accident to personnel	Person in distress in the water	Mod	Mod
Collision	Seaplane collides with vessel whilst taxiing	Hig	Mod
Collision	Impact with moored vessels	Sig	Mod
Other	Large Cruise vessel at anchor in Oban Bay drags its anchor	Mod	Mod
Mooring Failure	Mooring failure	Mod	Mod
Accident to personnel	Commercial diver in water whilst vessel manoeuvring in the vicinity	Mod	Low
Accident to personnel	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a scallop diver	Low	Low

The risk scores associated with each of the 37 hazard scenarios has been set on a scale of no Risk to Very High Risk. The outcome of each score is given in Table 16.

7.4 Tolerability

In determining whether the predicted level of risk is tolerable and acceptable, the following questions are considered:

- Is the risk below any unacceptable limit that has been established?
- If so, has it also been reduced to as low as reasonably practicable (ALARP)?

The risk is tolerable and acceptable if the answer to both these questions is 'Yes'. A&BC, as the harbour authority consider that any final risk outcome in the High or Very High band, is intolerable. Following which, all hazard scenarios have risk reduced to a point concluded to be ALAPR. Table 16 identifies the score outcome used in this NRA.

Table 16. Risk score rating

Classification	Score	Outcome
Very High Risk	9.00-10.00	VH
High Risk	6.00-8.99	Hig
Significant Risk	5.00-5.99	Sig
Moderate Risk	4.00-4.99	Mod
Low Risk	1.00-3.99	Low
Negligible Risk	0.01-0.99	Neg
No Risk	0	Non

7.5 Additional (future) risk controls

Additional controls have been identified to ensure that risk levels are reduced to a level which is considered to be ALARP (see Section 1.3.3 for a description of ALARP). These additional controls are safety recommendations which were then assigned a frequency and consequence reduction to allow the calculation of a future risk score. The identified measures, if fully adopted, should be incorporated into A&BC's harbour operational plans for establishing and running the enlarged harbour area.

Table 17 details the additional controls which were identified as recommendations for potential mitigation for the proposed harbour area along with the frequency in which they were applied to the hazard scenarios. It should be noted that where the future controls have the same name and application as embedded controls (i.e., those already in use in the current A&BC harbour) they have been included in the additional controls table.

Table 17. Additional controls

Control	Frequency
Contingency plan exercises	31
Council Emergency Plan (Local)	31
Harbour patrol	27
VTM - Seasonal Service	26
Powers obtained through HRO	23
Oil spill contingency plans	22
Direction (Special) - Powers of Harbour/Pier Master	21
Enforcement of speed limit	18
Harbour website	14
CCTV Coverage	13
Education (harbour community information)	13
Permit/Licensing scheme	13
Exclusion zone	12
Directions (General) - issued by Harbour Authority	9
Local Port Service - Harbour Control Office	9
Voluntary code for safe navigation	6
Pilotage	6
Emergency Towage	6
Zoning	5
LPS broadcast (navigation and safety information)	4
Requirement for notification of vessel defects	4
Shore side signage	4
Restricted visibility routine	4
Workboat/Tug	3
Signage for vessels	3
Availability of pollution response equipment	2
Hydrographic surveying program	2
Notices to mariners	2
Aids to navigation, Provision & maintenance of	1
Civil Contingency Plan	1
Communications - Stakeholder	1
Pre-bunkering checklist	1

Control	Frequency
Local Port Service	1
Training - Local regulations and powers	1
Evacuation Plan	1
Update UKHO chart	1

7.6 Risk evaluation: future

Following the application of the additional (future) risk controls throughout the proposed harbour area, the outcome of each hazard scenario in respect of the assessed future risk has been determined. The future risk outcome takes into account the frequency reduction and consequence reduction from each proposed risk control. Table 18 present the future risk level for the hazard scenarios after the additional controls have been applied.

Table 18. Future risk

Hazard Category	Hazard Scenario	Baseline Risk	Current Risk	Future Risk
Marine Pollution	Marine pollution from environment run off	Hig	Sig	Mod
Air Pollution	Air Pollution	Sig	Sig	Mod
Marine Pollution	Marine pollution from bunkering spill, marine incident or deliberate act	Hig	Hig	Mod
Other	Large Cruise vessel at anchor in Oban Bay drags its anchor	Mod	Mod	Low
Accident to personnel	Person in distress in the water	Mod	Mod	Low
Other	Small vessel gets entangled in creel pot's lines	Sig	Sig	Low
Other	Helicopter blade strike with vessel superstructure on take-off/landing	Sig	Sig	Low
Other	Inflatable craft blown offshore	Sig	Mod	Low
Contact with structure	Large vessel (ferry, cruise, cargo, large fishing) vessel contact with North Pier/NLB Pier	Mod	Mod	Low
Fire/Explosion	Fire on commercial vessel alongside	Sig	Sig	Low
Flooding/Foundering	Vessel sinks within harbour	Hig	Mod	Low
Mooring Failure	Mooring failure	Mod	Mod	Low
Accident to personnel	Recreational diving incident	Sig	Sig	Low
Collision	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/paddle craft).	Vhi	Sig	Low
Contact with floating object	Fast craft in contact with buoy	Mod	Mod	Low

Hazard Category	Hazard Scenario	Baseline Risk	Current Risk	Future Risk
Collision	Jet skis at speed in harbour collision with another vessel or swimmer	Vhi	Mod	Low
Other	Wash affecting moored vessels	Sig	Mod	Low
Collision	Sailing events and club activities	Vhi	Mod	Low
Collision	Impact with moored vessels	Sig	Mod	Neg
Collision	Seaplane (landing) collision with large vessel (ferry, cruise, cargo, large fishing).	Hig	Mod	Neg
Collision	Seaplane (on take-off) collides with large vessel at speed.	Hig	Mod	Neg
Collision	Seaplane strikes submerged/semi submerged object	Mod	Mod	Neg
Collision	Seaplane (on take-off) collides with small vessel (yacht/RIB/Powerboat/kayak) at speed.	Hig	Mod	Neg
Fire/Explosion	Fire on recreational/fishing vessel	Mod	Mod	Neg
Capsize/Sinking	Small vessel (yacht/RIB/Powerboat/paddle craft) swamped	Mod	Mod	Neg
Collision	Seaplane collides with vessel whilst taxiing.	Hig	Mod	Neg
Grounding	Large vessel (ferry, cruise, cargo, large fishing) grounds	Mod	Mod	Neg
Collision	Paddle craft with powered recreational craft (yacht/RIB/Powerboat)	Hig	Mod	Neg
Collision	Two commercial vessels collide	Vhi	Hig	Neg
Collision	Recreational vessel (yacht/RIB/Powerboat/paddle craft) with fishing	Vhi	Mod	Neg
Accident to personnel	Commercial diver in water whilst vessel manoeuvring in the vicinity.	Mod	Low	Neg
Accident to personnel	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a scallop diver.	Low	Low	Neg
Collision	Sailing vessel with other sailing vessel	Hig	Mod	Neg
Grounding	Recreational craft (yacht/RIB/Powerboat/paddle craft) or fishing craft grounds	Sig	Mod	Neg
Collision	Tendering operation from anchored cruise vessel to shore disembarkation location,	Vhi	Sig	Neg
Collision	Recreational (power or sail) craft with large vessel (ferry, cruise, cargo, large fishing)	Vhi	Sig	Neg
Collision	Small craft (not yacht) collision with commercial vessel	Vhi	Mod	Neg

8 NRA Discussion

This section expands upon the assessments and comments on future risk controls, as part of the future operation of a larger Oban Bay and Approach harbour operation. The following Section 8.1 provides a commentary on hazard scenarios and identified controls.

8.1 Hazard scenarios

The NRAs for the project which have an assessed outcome of significant risk (or above) when currently available controls are applied have been taken forward into this section for further consideration. These hazard scenarios are listed in Table 19.

Table 19. NRAs with significant current risk

Hazard Category	Hazard Scenario	Current Risk	Future Risk
Marine Pollution	Marine pollution from bunkering spill, marine incident or deliberate act	Hig	Mod
Collision	Two commercial vessels collide	Hig	Neg
Collision	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/paddle craft)	Sig	Low
Collision	Recreational (power or sail) craft with large vessel (ferry, cruise, cargo, large fishing)	Sig	Neg
Fire/Explosion	Fire on commercial vessel alongside	Sig	Low
Collision	Tendering operation from anchored cruise vessel to shore disembarkation location	Sig	Neg
Other	Helicopter blade strike with vessel superstructure on take-off/landing	Sig	Low
Marine Pollution	Marine pollution from environment run off	Sig	Mod
Other	Small vessel gets entangled in creel pot's lines	Sig	Low
Air Pollution	Air Pollution	Sig	Mod
Accident to personnel	Recreational diving incident	Sig	Low

8.1.1 Marine pollution – Marine pollution from bunkering spill, marine incident, or deliberate act

When responsible for an enlarged harbour area, the requirement for pollution response will also increase in line with the size of the harbour. This response would be required for any reported spills from the shore or any pollution resulting from an accident or deliberate discharge from a vessel, including bunkering operations at one of the terminals or marinas.

Vessel bunkering is currently undertaken at the North Pier, The Railway Pier, Kerrera Marina and South Pier. At present, only spillages within the Oban North Pier Pontoons would fall under their responsibility of A&BC, however with an extended area the resources and the capabilities to undertake a clean-up of a large spill will have to be expanded and made capable of tackling any incident within the wider area. Where there are other operators in the area which have their own pollution response capabilities, a joint response plan or agreement should be considered.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- Availability of pollution response equipment: additional response equipment in order to handle spills within the proposed harbour area and additional kits.
- Contingency plan exercises: the harbours current contingency plans would need to be expanded to cover the whole of the proposed Oban Bay harbour limits.
- Council Emergency Plan (Local): the standing council emergency plan would need to be expanded to cover the whole of the proposed Oban Bay harbour limits.
- Oil spill contingency plans: the harbours current Oil Spill contingency plan would need to be expanded to cover the whole of the proposed Oban Bay harbour limits.
- Pre-bunkering checklist: would need to be distributed to all other bunkering sites within the proposed SHA with operating procedures ensuring that the operation is managed safely.

Following the implementation of mitigation measures, specifically the additional oil pollution response equipment will provide greater opportunity for oil spills to be contained. The review of all emergency and contingency plans would also be essential in ensuring that there is appropriate resources and procedures in responding to such an event within the proposed harbour area. With the future mitigation measures implemented, the risk is assessed to reduce to a Moderate level which recognises the effectiveness of appropriate equipment, exercising emergency plans and procedures in place to react to a marine pollution event.

8.1.2 Collision – Two commercial vessels collide

Consultation with local stakeholders indicated that large commercial vessels often operate in the North Channel simultaneously (or in close proximity) where there is only appropriate sea room for one such vessel to transit at a time, thus causing one vessel to either delay departure or arrive late. Occasionally, to manage interactions, vessels wait or drift inside Oban Bay and the approaches. Interaction of large vessels in a confined space with little operational control presents a collision or grounding risk.

With the added complication of frequent recreational activity in both the North Channel approach and Oban Bay, Masters and Officers on large vessels could become overwhelmed with traffic information and keeping a watch on large, medium and small craft. A collision between large vessels could cause substantial damage to either vessel, with a worst credible incident being a holed hull and stranding or sinking of either of the vessels. This type of incident presents as a high risk.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- CCTV Coverage: additional cameras added to Argyll and Bute Councils array in order to have better coverage of the approaches and the Sound of Kerrera.
- Contingency plan exercises: the harbours current contingency plans would need to be expanded to cover the whole of the proposed Oban Bay harbour limits.
- Council Emergency Plan (Local): the standing council emergency plan would need to be expanded to cover the whole of the proposed Oban Bay harbour limits including additional emergency.

- Direction (Special) - Powers of Harbour/Pier Master: Harbour Master to obtain powers of special directions, with ability to delegate powers for the whole harbour area.
- Directions (General) issued by Harbour Authority: ability to issue general directions to all harbour users within the proposed harbour area as obtained in the HRO.
- Exclusion zone: moving exclusion zone around vessels entering/leaving Oban Bay through North Channel.
- Harbour website: have a dedicated Oban Harbour website and Facebook page. Keep information up to date and relevant.
- Local Port Service - Harbour Control Office: harbour control office appropriately equipped and manned to meet the scale of harbour activity.
- Oil spill contingency plans: the harbours current Oil Spill contingency plan would need to be expanded to cover the whole of the proposed Oban Bay harbour limits.
- Enforcement of speed limit - Speed limit enforced to all craft in appropriate areas of Oban Bay and Kerrera Sound.
- Powers obtained through HRO: ability to set an enforceable speed limit for all craft and other arrival and departure requirements.
- Pilotage: compulsory Pilotage to provide expert knowledge and ship handling skills and PEC authorisation.
- VTM - Seasonal Service: seasonal VTM, managing and deconflicting traffic movements, enforcing speed limits and other regulations.
- Restricted visibility routine: limit on speed and departure/arrival for large vessels, regular traffic information dissemination in times of restricted visibility.

Following the implementation of mitigation measures, specifically the implementation of Harbour Master powers of Special Direction and General Directions, the harbour authority for an expanded harbour area will have the powers to manage vessel traffic. Additionally, during busy periods, the ability to have a Vessel Traffic Management (VTM) service will allow for much greater oversight of vessels movements with the ability to organise traffic movements to deconflict vessel interaction. It is assessed that the combination of these future controls would reduce the risk level to low risk.

8.1.1 Collision – Seaplane (landing) collision with small vessel (yacht/RIB/ powerboat/paddle craft)

Oban Bay is categorised by the CAA (Civil Aviation Authority) as a Seaplane landing site and has historically had a scheduled sea plane service. Whilst this operation does not occur at present, the potential for *ad hoc* or a scheduled service remains. A Seaplane operation presents a range of hazards for other marine users during the landing, taxi and take-off operation. Small craft such as sailing boats RIBs and paddle craft may not be as visible to the aircraft and the watercraft themselves will not be able to move out of the way particularly quickly may result in a collision. A collision between a Seaplane and a small vessel would potentially result in significant damage to the sea plane and small vessel with multiple fatalities on both crafts. This incident would also involve delays to ferry services in the area and pollution either from the vessel or the sea plane.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- Contingency plan exercise: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Council Emergency Plan (Local): to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Exclusion zone: around seaplane to ensure area is clear before take-off and landing.
- Harbour patrol: direct vessels and clear take off/landing zone.

- Oil spill contingency plans: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Voluntary code for safe navigation: code to be compulsory.
- Enforcement of speed limit: speed limit enforced to all craft.
- Powers obtained through HRO: ability to set an enforceable speed limit for all craft.
- VTM - Seasonal Service: direct vessels and clear take off/landing zone.

Following the implementation of mitigation measures, specifically the use of a VTM services which can engage with vessels in the area via a harbour control office (as an LPS service), risk can be managed through traffic organisation and Harbour Master directions. The review of all emergency and contingency plans would also be essential in ensuring that there is appropriate resources and procedures in responding to an event involving a Seaplane within the proposed harbour area. It is assessed that the combination of these future controls would reduce the risk level to low risk.

8.1.2 Collision – Recreational (power or sail) craft with large vessel (ferry, cruise, cargo, large fishing)

Oban Bay has a high level of recreational vessel activity, mainly during the summer months, with visiting vessels and a local based fleet. These vessels use Oban North Pier Pontoons as a transit facility for short stays (up to three nights) and Kerrera Marina for longer stays. In addition, there are private moorings throughout the Sound of Kerrera and the south side of Oban Bay. These craft operate in the same areas as large commercial operators often crossing areas of their intended transit specifically in the North Channel approaches in which all vessel traffic uses the same waterspace. The existing small vessel route crosses the bay between Oban Town and Oban (Kerrera) Marina and creates crossing situations for larger commercial traffic, fishing and recreational craft.

This crossing situation provides the potential for vessel collision, if marine craft do not correctly apply COLREGS. Anecdotal information from stakeholder consultation identified near-miss and actual incidents (see Figure 8 and Figure 9). The HAZID considered accounts of arriving and departing ferries which have been required to use warning signals as a result of the unknown intentions of recreational craft. This is more likely to occur during summer periods when the recreational activity is heightened and there are a greater number of water users, some of which may not be familiar with COLREGS. Any collision incident between a large commercial or passenger vessels with a recreational craft has the potential to cause significant damage or complete destruction to the recreational craft with the possible loss of life.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- CCTV Coverage: expanded to Sound of Kerrera, CCTV monitored.
- Contingency plan exercises: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Council Emergency Plan (Local): to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Direction (Special) - Powers of Harbour/Pier Master: Harbour Master to obtain powers of special directions, with ability to delegate powers for the whole harbour area.
- Education (harbour community information): improve the knowledge of recreational users on vessel rights of way and the small vessel channel.
- Exclusion zone: moving exclusion zone around vessels entering/leaving Oban Bay through North Channel.
- Harbour patrol - Seasonal and directing traffic, enforcing speed limits and other regulations.

- Harbour website: take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant.
- Local Port Service/Harbour Control Office: harbour control office appropriately equipped and manned to meet the scale of harbour activity.
- Oil spill contingency plans: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Enforcement of speed limit: speed limit enforced to all craft.
- Powers obtained through HRO: ability to set an enforceable speed limit for all craft.
- Zoning: small vessel channel clearly advised.
- Emergency Towage: appropriate workboat/tug to assist towage.
- VTM - Seasonal Service: seasonal VTM, managing and deconflicting traffic movements, enforcing speed limits and other regulations.
- Permit/Licensing scheme: requirements placed on training and insurance.
- Signage for vessels: signage warning vessels entering busy areas.
- Restricted visibility routine: limit on speed and departure/arrival for large vessels, regular traffic information dissemination.

Following the implementation of mitigation measures, specifically the Local Port Service/Harbour Control Office, powers obtained through HRO and zoning, the harbour authority would have appropriate powers to manage vessel traffic. In addition, the use of a dedicated harbour patrol this will allow for recreational vessels operating inappropriately to be directed with Harbour Master directions. It is assessed that the combination of these future controls would reduce the risk level to negatable risk.

8.1.3 Fire/explosion - Fire on commercial vessel alongside

With cargo vessels, passenger vessels and fishing vessels operating in the area, it is entirely conceivable that a vessel may experience a fire whilst alongside one of the berths. Commercial and passenger vessels can carry flammable substances or carry out operations (bunkering) which have a risk of fire or explosion. If a fire was to occur alongside, in the most likely case, this could be handled quickly by those on board however there is a potential for this to become a severe incident leading to fire/explosion with loss of life, serious pollution and a possibility for total loss of the vessel. This type of incident has the potential to occur throughout the lifetime of the harbour and is assessed to be a significant risk.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- CCTV Coverage: expanded to Sound of Kerrera, CCTV monitored.
- Direction (Special), Powers of Harbour/Pier Master: the power to issue directions to marine traffic in Oban Bay and approaches.
- Harbour patrol: seasonal and directing traffic, enforcing speed limits and other regulations.
- Local Port Service/Harbour Control Office: direct and coordinate emergency response.
- Requirement for notification of vessel defects: to be written into the HRO.

Following the implementation of mitigation measures, specifically CCTV coverage and Local Ports Service/Harbour Control Office, the harbour authority would be able to provide a response to any potential fire, including directing traffic away from danger. Should the potential for an incident be identified, the powers of a Harbour Master could be used to restrict, prohibit or control potential causes of fire whilst a vessel is alongside within the harbour area. As part of managing the response to a potential fire, the Harbour can seek engagement with the Local Fire Service, and plan vessel familiarity visits, as well as exercises that involve the LPS and Local Fire Service. It is assessed that the combination of these future controls would reduce the risk level to low risk.

8.1.4 Collision - Tendering operation from anchored cruise vessel to shore disembarkation location,

When cruise vessels visit and anchor outside of the approaches to the North Channel, tenders are regularly used to ferry passengers to and from Oban North Pier Pontoons. A tender with the maximum number of passengers on-board could be involved in a collision with another tender or another vessel when transiting to the harbour which results in the tender being holed and sinking. This would result in the crew and passengers entering the water with the potential for fatalities. Additionally, this would affect other operations in Oban Bay area until the incident is dealt with resulting in a large media interest and significant adverse publicity.

The HAZID workshop considered the frequency of this hazard scenario to be low, however the severity creates a significant-risk due to the implications it would cause to the harbour authority and local area. This type of incident has the potential to during any cruise vessel visit and therefore presents a significant risk.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- CCTV Coverage: expanded to Sound of Kerrera, CCTV monitored.
- Contingency plan exercises: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Council Emergency Plan (Local): to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Direction (Special), Powers of Harbour/Pier Master: Harbour Master to obtain powers of special directions, with ability to delegate powers for the whole harbour area.
- Directions (General) - issued by Harbour Authority: ability to issue general directions to jet skis obtained in the HRO.
- Exclusion zone: moving exclusion zone around vessels entering/leaving Oban Bay through North Channel.
- Harbour website: take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant.
- Local Port Service /Harbour Control Office: harbour control office appropriately equipped and manned to meet the scale of harbour activity.
- Oil spill contingency plans: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Enforcement of speed limit: speed limit enforced to all craft.
- Powers obtained through HRO: ability to set an enforceable speed limit for all craft.
- Pilotage: compulsory Pilotage to provide expert knowledge and ship handling skills.
- VTM - Seasonal Service: seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations.
- Restricted visibility routine: limit on speed and departure/arrival for large vessels, regular traffic information dissemination.

Following the implementation of mitigation measures, specifically the Local Port Service/Harbour Control Office, powers obtained through HRO and zoning would allow the Harbour Authority to appropriately manage craft within the whole harbour area. In addition, the assistance of a Harbour Patrol would allow for tender vessels to be directed with Harbour Master directions. It is assessed that the combination of these future controls would reduce the risk level to negatable risk.

8.1.5 Other –Helicopter blade strike with vessel superstructure on take-off/landing

The chance of a helicopter blade strike in the area is very small, however if one was to occur the severity of such an incident would be significant. A helicopter blade strike could occur in several different scenarios, either involving a rescue helicopter, a helicopter using the NLB quay, or a private helicopter visiting the area. A blade strike event with ships superstructure could result in a helicopter crash into Oban Bay with fatalities to helicopter crew and passengers and small-scale pollution from aviation fuel from the aircraft. This would suspend any operations in Oban Bay, with extensive media coverage.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- Contingency Plan exercises: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Council Emergency Plan (Local): to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Direction (Special) - Powers of Harbour/Pier Master: Harbour Master to obtain powers of special directions, with ability to delegate powers for the whole harbour area.
- Directions (General) - issued by Harbour Authority: ability to issue general directions to jet skis obtained in the HRO.
- Local Port Service - Harbour Control Office: harbour control office appropriately equipped and manned to meet the scale of harbour activity.
- Oil spill contingency plans: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.

Following the implementation of mitigation measures, specifically the update of harbour contingency and emergency plans for the wider harbour area, the Harbour Authority would be prepared to deal with a marine incident. This also assumes that exercises are carried out to test preparedness and response. In addition, the Directions and powers given to the harbour and harbour and Harbour Master as part of the HRO can restricted such events in the Oban Bay area. It is assessed that the combination of these future controls would reduce the risk level to low risk.

8.1.6 Marine pollution - Marine pollution from environment run off

Pollution caused by environment run off and spread by rain into Oban Harbour is a common event (in which currently, there is not a specific authority to deal with the affects). This pollution is then further spread by wind and the current over Oban Bay. It spreads to the foreshore resulting in a Tier 1 oil spill causing a large impact on local businesses operating in the vicinity.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- Oil spill contingency plans: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.

Following the implementation of mitigation measures, specifically the additional oil pollution response equipment will provide greater opportunity for oil spills to be contained. The review of all emergency and contingency plans would also be essential in ensuring that there is appropriate resources and procedures in responding to such an event within the proposed harbour area. This should ideally be done in conjunction with the Tier 2 provider(s). It is assessed that the combination of these future controls would reduce the risk level to moderate risk.

8.1.7 Other – Small vessel gets entangled in creel pot's lines

With a number of pots in Sound of Kerrera and Oban Bay, a number of which are not appropriately marked, the potential for vessels to become entangled and immobilized is apparent. A small vessel which could potentially get caught in the pot ropes will likely lose propulsion and if unable to remove from the prop would overheat. This vessel would then become a hazard to other navigating vessels as it may cause a collision or run aground damaging the vessel.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- CCTV Coverage: expanded to Sound of Kerrera, CCTV monitored.
- Contingency plan exercises: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Council Emergency Plan (Local): to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Direction (Special)/Powers of Harbour/Pier Master: Harbour Master to obtain powers of special directions, with ability to delegate powers for the whole harbour area.
- Education (harbour community information): coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.
- LPS broadcast (navigation and safety information): harbour control office appropriately equipped and manned to meet the scale of harbour activity.
- Oil spill contingency plans: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.

Following the implementation of further harbour directions would allow rules to be put into place around the use of pots in the harbour area. CCTV and LPS broadcasts would enable the harbour authority to react and warn people of vessels drifting or assist vessels in distress. It is assessed that the combination of these future controls would reduce the risk level to low risk.

8.1.8 Air pollution – Air pollution

When vessels are running their engines and/or generator in Oban Harbour whilst alongside it has been known to causes air emissions which result in discomfort to public and harbour users. This usually only occurs on still days where the fumes cannot be disperses by the wind. However, on days with little to no wind the fumes stay dense and dissipates very slowly which has potential to cause minor injuries from fume inhalation and a minor effect on environment. This is also bad publicity for the harbour and local area.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- Direction (Special) - Powers of Harbour/Pier Master: to allow polluting vessel to be moved in order to limit disruption.
- Requirement for notification of vessel defects: this will be written into the HRO and enable the Harbour Master to manage any potential air pollution events before they occur.

Following the implementation of these mitigation measures which both allow the Harbour Master to gather information on potential causes before they occur and have rules in place limiting the use of engines whilst alongside. It is assessed that the combination of these future controls would reduce the risk level to moderate risk.

8.1.9 Accident to personnel - Recreational diving incident

With recreational diving happening in the Sound of Kerrera and diving operators providing training to tourists there is a chance for those recreational divers to be injured during the dive either through equipment failure or other uses entering there diving area and striking a diver or disturbing them through wash created. These incidents have the potential to cause minor injuries or even fatal injuries to the divers. Incidents such as this would cause media interest leading to adverse publicity for Oban Bay and the surrounding area.

The following mitigation measures were identified during the HAZID workshop as having the ability to further reduce the risk.

- Contingency plan exercises: to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Council Emergency Plan (Local): to be expanded to the whole of the proposed Oban Bay and Approaches harbour limits.
- Directions (General) - issued by Harbour Authority: ability to issue general directions obtained in the HRO to control diving areas.
- Education (harbour community information): education to user groups in harbour.
- Harbour patrol: seasonal and directing traffic, enforcing speed limits and other regulations.
- Harbour website: take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant.
- Powers obtained through HRO: ability to set an enforceable speed limit for all craft.
- VTM - Seasonal Service: seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations.
- Permit/Licensing scheme: controls over insurance, launching, age restrictions.

Following the implementation of mitigation measures, specifically harbour patrol and a harbour control office, would allow the Harbour Authority to monitor diving activities and warn other traffic of the activity in that area. In addition, the harbour website and education material can properly inform water users of the correct signals involved with diving and what you should do if you observe them. It is assessed that the combination of these future controls would reduce the risk level to low risk.

9 Mitigation and Measures

The following sections expand upon the additional (future) risk controls identified in Section 0. The context of the description is drawn from the assessments in Appendix C.

1. Contingency plan exercises: will detail responses to emergency situations, along with contact details for local authorities. As part of this plan training and exercise of personnel will be required.
2. Council Emergency Plan (Local): will detail responses to emergency situations, along with contact details for local authorities. As part of this plan training and exercise of personnel will be required.
3. Harbour patrol: A vessel and trained staff which are available to move around the proposed harbour area informing water users of rules and responsibilities, responding to emergencies and providing assistance to those in need. The trained personnel and equipment on the vessel should be appropriate for the potential situations that may require the assistance of the harbour patrol.
4. VTM - Seasonal Service: A seasonal VTM service which operates during the busy months and busy periods for example this would be limited from April to October and cover day light hours. Where the service in the winter period would be reduce to a watch on the harbour VHF channel.
5. Powers obtained through HRO: Additional powers which would enable the Harbour Master or their deputies to enforce rules against all water users and within a large area as defined by the proposed harbour area.
6. Oil spill contingency plans: to detail the response to any marine pollution event.
7. Direction (Special) - Powers of Harbour/Pier Master - Allow the Harbour Master and their deputies to issue orders/directions to water users in order to maintain the safety of navigation.
8. Enforcement of speed limit: To restrict the speed of vessels within a certain area as to reduce the effect of wash and potential damage to other water users or property within the speed restriction area.
9. Harbour website: Provides all users of the harbour somewhere to find all relevant information for the harbour authority.
10. CCTV Coverage: Passive monitoring of marine operations via cameras covering the marine works will highlight adverse conditions to those monitoring operations.
11. Education (harbour community information) - Harbour authority delivered education for the community or like walks users in the form of leaflets signage and talks will help better educate water users in safe.
12. Permit/Licensing scheme: The licencing and permitting of work boats who intend to provide a service within the harbour area would allow for conformance with national legislation and promote better safety culture within the local area.
13. Exclusion zone - an area in which no traffic or specific types of vessels would not be allowed to enter. Therefore, protecting this certain area from disturbance of passing craft.
14. Directions (General) - issued by Harbour Authority: The use of general directions allow the harbour too issue a number of rules and regulations that must be followed by all visiting vessels or users of the harbour area.
15. Voluntary code for safe navigation: a voluntary code to be used to provide a list of rules for local water users to abide by when visiting open Bay.
16. Pilotage: in certain scenarios pilotage maybe required in order to maintain safety of navigation for visiting vessels which are not common to the local area and are larger than the regular visiting vessels.

17. Civil Contingency Plan: A plan informing the harbour authority how to handle certain incident scenarios with local emergency providers and council resources. The harbour authority as a category 2 responder will have responsibilities in local emergencies.
18. Emergency Towage: Towage provided by local resources or when required by external providers to tow vessels indeed to a safe location.
19. Zoning: Partitioning of the harbour area by activity to traffic direction in order to separate different flows of traffic improving the safety of the area.
20. LPS broadcast (navigation and safety information): The harbour authority broadcasting navigational and safety information two vessels within the harbour area on a local channel. as to inform water users of any dangers to navigation.
21. Requirement for notification of vessel defects: New harbour regulations with a requirement for damaged or defected vessels to notify the Harbour Master of the issues. Allowing the Harbour Master to take action two any potential incidents.
22. Shore side signage: Shoreside signage identify rules and regulations too users of the harbour.
23. Restricted visibility routine: In instances where restricted visibility is deemed a hazard to navigation the harbour authority may determine additional rules and restrictions to ensure safety of navigation is maintained.
24. Workboat/Tug: An external resource which could be brought in to refloat, recover or assist vessels. Signage for vessels: Additional signage for vessels entering the harbour area informing water users of local rules and regulations they need to abide by
25. Availability of pollution response equipment: Additional pollution response equipment would be required to enable the harbour authority to respond to an oil spill anywhere within the proposed harbour area.
26. Hydrographic surveying program: A survey programme would be used to ensure that the harbour area is regularly surveyed as required by the PMSC and update any local charts via the UKHO if any changes where observed. These changes would also be promulgated by the likes of a Notice to Mariners.
27. Notices to mariners: Information regarding the certain activities or changes to the harbour area should be provided to the UK Hydrographic Office so that a notice to mariners can be issued to update charts and sailing information. This information should also be promogulated in local notices to mariners can be issued to inform the port community.
28. Aids to navigation, Provision & maintenance of: Aids to navigation should be provided after consultation with the Northern Lighthouse Board (NLB) and agreement on the management of local lights. The aids to navigation must be maintained to provide the availability of the aids to navigation required by NLB with any out of service periods reported via the Provider Aids to Navigation Availability Reporting (LATON) system.
29. Communications/Stakeholder: Local user groups and lists of stakeholder contacts in order to keep local stakeholders informed of any changes and updates to local rules, operations and changes in the navigational environment.
30. Pre-bunkering checklist: A checklist for operators and vessels to follow when conducting bunkering operations within the harbour authority area of jurisdiction. This list would also identify rules to follow when conducting such operations.
31. Local Port Service: Provide local services in the form of advice, instruction or assistance tendered or provided to the vessel in the form of navigational and services advice.
32. Training: Local regulations and powers - All staff will require additional training in order to understand associated with the project should be considered to determine the training that will be required to ensure that personnel have the required level of competence to carry out their functions. Nationally accepted qualifications should be considered alongside training in project specific plans and procedures.
33. Evacuation Plan: To ensure appropriate plan for people to be evacuated from vessel or shore side area to a safe location with shore side resources to provide first response.

34. Update UKHO chart: Information on new harbour boundaries should be shared with the UKHO in order for visiting vessels to know where the new harbour boundary is and who's jurisdiction, they are entering into in order to abide by the correct harbour directions.
35. Proposed HRO Justification: The area has been proposed as it incorporates traffic entering the Northern Channel from both an easterly and north-west direction, as seen in the traffic monitoring information. It also incorporates the anchorages area outside of the Northern Channel in order to manage any large vessel which may wish to anchor in close proximity to the Approaches. In the Sound of Kerrera, the boundary is set south of the Gallanach to Kerrera ferry.

10 Conclusion and Summary

10.1 Proposed harbour limits

The proposed harbour limits are shown in Figure 1. This NRA supports those limits through the collection of vessel traffic data showing vessel use pattern and the completion of a set of risk assessments for the study area. These assessments demonstrate that a reduction in risk can be achieved through the implementation of marine risk controls. A summary of controls is presented in Section 9 and a further overall summary in Section 10.2.

The northern limits of the proposed harbour area are identified as a boundary that includes the North Channel approach to Oban Bay, including the area between Maiden Island and the mainland. The area also includes the anchorage areas to the west of the approaches where cruise vessels and other larger craft anchor. Tendering activity will therefore fall within the boundary of the northern most limits of the proposed harbour area. Figure B10 presents a density grid of traffic activity drawn from 2022 collected data, this shows the area of intense use through the North Channel approach. This area would be included into the new harbour limits and controlled via a range of vessel traffic measures. To the south, along the Sound of Kerrera, the harbour limits are proposed to fall to the south of the Gallanach to Kerrera ferry route. This will ensure that any vessel interaction between the ferry and passing traffic will fall within the new limits and remit of the harbour authority.

10.2 Summary of the NRA

In total, 37 hazard scenarios were identified and assessed. Consultation has been conducted with stakeholders to draw out local user opinion. To inform the consultees, information defining the baseline navigational environment has been used, including a traffic survey has been undertaken drawn from AIS data and Non-AIS data collected in the summer and winter of 2022.

From the NRA process, 35 future mitigation measures were identified, these were made up of either newly identified mitigation measures or current mitigation measures which would then be applied to a larger harbour area and thus would require re-appraising and adaption. Following implementation of appropriate mitigation by the Council, within the context of the proposed harbour area, marine risk to navigational receptors can be maintained within a level that is ‘As Low As Reasonably Practicable’.

It is concluded that the proposed harbour area would allow for a significant improvement in marine traffic management. This can only be achieved if the SHA boundary is changed to allow the powers conveyed through local Acts and Order, to be used by the Harbour Authority. Specifically, the powers of Directions, which may be used by harbour staff through delegation, including patrol officers, LPS staff, VTM officers or other appropriately trained members of the harbours team. The implementation of a larger Harbour Authority limit, alongside the modernisation of harbour powers, will allow improved traffic management for the whole area, reduce marine risk with the potential to improve contingency response and marine emergency preparedness.

11 References

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12 Abbreviations/Acronyms

A&BC	Argyll and Bute Council
ACOP	Approved Code of Practice
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AtoN	Aids to Navigation
CAA	Civil Aviation Authority
CCTV	Closed Circuit Television
CFL	CalMac Ferries Limited
CMAL	Caledonian Maritime Assets Ltd
COLREGS	International Regulations for Preventing Collisions at Sea 1972 (as amended)
CTV	Crew Transfer Vessel
DfT	Department for Transport
FAA	Federal Aviation Administration
FSA	Formal Safety Assessment
GIS	Geographic Information System
GRP	Glass Reinforced Plastic
GT	Gross Tonne
GtGP	Guide to Good Practice
HAZID	Hazard Identification
Hig	High Risk
HM	His (Her) Majesty's
HRO	Harbour Revision Order
HSE	Health and Safety Executive
HSPV	High Speed Passenger Vessel
ID	Identity
IMO	International Maritime Organization
inc.	Including
ISM	International Safety Management
LATON	Aids to Navigation Availability Reporting system
LLA	Local Light House Service
Low	Low Risk
LPS	Local Port Service
MAIB	Marine Accident Investigation Branch
MARNIS	Port Risk Management Software
MCA	Maritime Coastguard Agency
MGN	Marine Guidance Note
Mod	Moderate Risk
MSMS	Marine Safety Management Systems
MV	Motor Vessel
Neg	Negligible Risk
NLB	Northern Lighthouse Board
Non	No Risk
NRA	Navigational Risk Assessment
OBCB	Oban Bay Community Berthing Ltd
OCHDA	Oban Community Harbour Development Association
OREI	Offshore Renewable Energy Installations
OSC	Oban Sailing Club
PEC	Pilotage Exemption Certificate

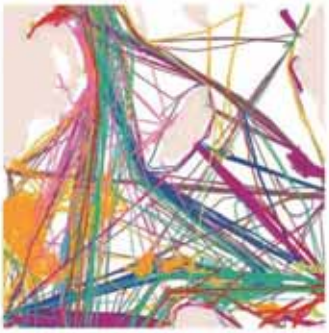
PMSC	Port Marine Safety Code
POB	Pilot On Board
RIB	Rigid Inflatable Boat
RNLI	Royal National Lifeboat Institution
RoRo	Roll-on, Roll-off
RYA	Royal Yachting Association
SEASTATES	ABPmer's Metocean Information Service
SHA	Statutory Harbour Authority
Sig	Significant Risk
SMS	Safety Management System
STCW	Standards of Training, Certification and Watchkeeping
SUP	Stand Up Paddleboard
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
VHi	Very High Risk
VHF	Very High Frequency
VTM	Vessel Traffic Management

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

Appendices





Innovative Thinking - Sustainable Solutions

ABP mer

A Accident Incident Data

Record Origin	Incident Date	Incident Type	Latitude	Longitude
MAIB	2009	Equipment Failure (vessel)	56.4333	-5.51
MAIB	2012	Person in distress	56.4167	-5.4833
MAIB	2013	Collision	56.4306	-5.5166
MAIB	2013	To be deleted	56.4306	-5.5166
MAIB	2013	Grounding	56.42	-5.4917
MAIB	2014	Collision	56.42	-5.485
MAIB	2014	To be deleted	56.42	-5.485
MAIB	2014	Grounding	56.4133	-5.485
MAIB	2015	Person in distress	56.4133	-5.48
MAIB	2015	To be deleted	56.4123	-5.4768
MAIB	2015	Person in distress	56.4125	-5.4771
MAIB	2016	To be deleted	56.4127	-5.4772
MAIB	2016	To be deleted	56.4124	-5.4769
MAIB	2016	To be deleted	56.4217	-5.4883
MAIB	2016	Collision	56.4167	-5.4833
MAIB	2016	To be deleted	56.4167	-5.4833
MAIB	2016	Equipment Failure (vessel)	56.4343	-5.5227
MAIB	2016	Person in distress	56.4276	-5.4904
MAIB	2016	Person in distress	56.4139	-5.4808
MAIB	2016	Equipment Failure (vessel)	56.4156	-5.4856
MAIB	2017	Grounding	56.4142	-5.4742
MAIB	2017	Grounding	56.4143	-5.4775
MAIB	2017	Equipment Failure (vessel)	56.3967	-5.5208
MAIB	2017	Impact with structure	56.3998	-5.5175
MAIB	2018	Leaks/swamping	56.413	-5.4743
MAIB	2019	To be deleted	56.4146	-5.4751
MAIB	2019	Equipment Failure (vessel)	56.4172	-5.5168
MAIB	2020	Person in distress	56.4189	-5.512
MAIB	2020	Equipment Failure (vessel)	56.4133	-5.4767
MAIB	2021	To be deleted	56.3983	-5.507
MAIB	2021	Equipment Failure (vessel)	56.415	-5.48
MAIB	2021	Person in distress	56.4167	-5.4846
MAIB	2021	Person in distress	56.4133	-5.4767
RNLI	2016	Person in distress	56.4172	-5.4907
RNLI	2016	Other nautical safety	56.4095	-5.4942
RNLI	2012	Leaks/Swamping	56.407	-5.4937
RNLI	2008	Leaks/Swamping	56.4155	-5.4753
RNLI	2015	Person in distress	56.419	-5.4967
RNLI	2010	Person(s) in water	56.435	-5.4801
RNLI	2012	Equipment failure (vessel)	56.4142	-5.4797

Record Origin	Incident Date	Incident Type	Latitude	Longitude
RNLI	2013	Person in distress	56.4205	-5.4923
RNLI	2010	Person(s) in water	56.4112	-5.4792
RNLI	2015	Grounding	56.4217	-5.4833
RNLI	2010	Grounding	56.4221	-5.4896
RNLI	2010	Grounding	56.4221	-5.4896
RNLI	2010	Equipment failure (vessel)	56.4288	-5.4873
RNLI	2012	Person in distress	56.4067	-5.4958
RNLI	2008	Leaks/Swamping	56.3884	-5.5215
RNLI	2014	Person(s) in water	56.4217	-5.4922
RNLI	2013	Grounding	56.4173	-5.4989
RNLI	2013	Grounding	56.419	-5.4966
RNLI	2012	Equipment failure (vessel)	56.4298	-5.5045
RNLI	2011	Person in distress	56.4186	-5.4969
RNLI	2014	Person in distress	56.4163	-5.4932
RNLI	2015	Person in distress	56.4112	-5.4793
RNLI	2012	Person(s) in water	56.4158	-5.4843
RNLI	2008	Equipment failure (vessel)	56.3949	-5.5207
RNLI	2014	Person in distress	56.4118	-5.4848
RNLI	2010	Person in distress	56.4186	-5.4988
RNLI	2010	Person in distress	56.4127	-5.4759
RNLI	2012	Grounding	56.3995	-5.5078
RNLI	2012	Person in distress	56.413	-5.4745
RNLI	2014	Grounding	56.4137	-5.4872
RNLI	2013	Grounding	56.3805	-5.5303
RNLI	2013	Person in distress	56.4192	-5.495
RNLI	2015	Grounding	56.4183	-5.4808
RNLI	2008	Other nautical safety	56.419	-5.4943
RNLI	2010	Person in distress	56.4185	-5.495
RNLI	2011	Grounding	56.4133	-5.4876
RNLI	2011	Grounding	56.4133	-5.4876
RNLI	2008	Person in distress	56.418	-5.4988
RNLI	2010	Equipment failure (vessel)	56.3746	-5.5344
RNLI	2010	Grounding	56.4002	-5.5083
RNLI	2010	Person in distress	56.4188	-5.4981
RNLI	2010	Equipment failure (vessel)	56.3754	-5.5392
RNLI	2014	Grounding	56.4115	-5.4978
RNLI	2015	Equipment failure (vessel)	56.4107	-5.4892
RNLI	2014	Person in distress	56.4178	-5.4967
RNLI	2012	Person(s) in water	56.4184	-5.4964
RNLI	2015	Grounding	56.4143	-5.4877
RNLI	2011	Person in distress	56.419	-5.4966
RNLI	2014	Equipment failure (vessel)	56.3793	-5.5338
RNLI	2015	Equipment failure (vessel)	56.3869	-5.5315

Record Origin	Incident Date	Incident Type	Latitude	Longitude
RNLI	2012	Person in distress	56.4185	-5.4966
RNLI	2015	Equipment failure (vessel)	56.429	-5.4935
RNLI	2008	Fire/Explosion	56.4028	-5.5096
RNLI	2014	Grounding	56.4142	-5.4872
RNLI	2012	Person(s) in water	56.4134	-5.475
RNLI	2011	Person in distress	56.4118	-5.4845
RNLI	2010	Person in distress	56.4189	-5.4983
RNLI	2011	Person(s) in water	56.4135	-5.4733
RNLI	2008	Person in distress	56.4183	-5.4826
RNLI	2010	Collision	56.4118	-5.4845
RNLI	2014	Equipment failure (vessel)	56.4192	-5.4933
RNLI	2009	Person in distress	56.4185	-5.4786
RNLI	2009	Equipment failure (vessel)	56.4292	-5.5023
RNLI	2008	Person in distress	56.4187	-5.4959
RNLI	2008	Person in distress	56.383	-5.5335
RNLI	2010	Equipment failure (vessel)	56.4105	-5.4974
RNLI	2008	Person in distress	56.3988	-5.516
RNLI	2010	Person in distress	56.3921	-5.5159
RNLI	2010	Equipment failure (vessel)	56.4193	-5.4806
RNLI	2018	Equipment failure (vessel)	56.43733	-5.515
RNLI	2018	Leaks/Swamping	56.413	-5.475
RNLI	2019	Person in distress	56.41294	-5.4752
RNLI	2018	Grounding	56.41335	-5.48851
RNLI	2018	Grounding	56.41883	-5.482
RNLI	2017	Equipment failure (vessel)	56.39667	-5.52083
RNLI	2017	Person in distress	56.41333	-5.48667
RNLI	2017	Equipment failure (vessel)	56.43	-5.4895
RNLI	2019	Person in distress	56.41278	-5.47537
RNLI	2019	Other nautical safety	56.42207	-5.48919
RNLI	2019	Grounding	56.42221	-5.4889
RNLI	2019	Other nautical safety	56.42207	-5.48919
RNLI	2019	Grounding	56.42221	-5.4889
RNLI	2019	Other nautical safety	56.42207	-5.48919
RNLI	2019	Grounding	56.42221	-5.4889
RNLI	2020	Other nautical safety	56.42015	-5.4892
RNLI	2020	Person in distress	56.41294	-5.47461

B Vessel Activity Data Figures

B.1 AIS Transits

B.2 Non AIS Transits

B.3 Transits 2022 Overview

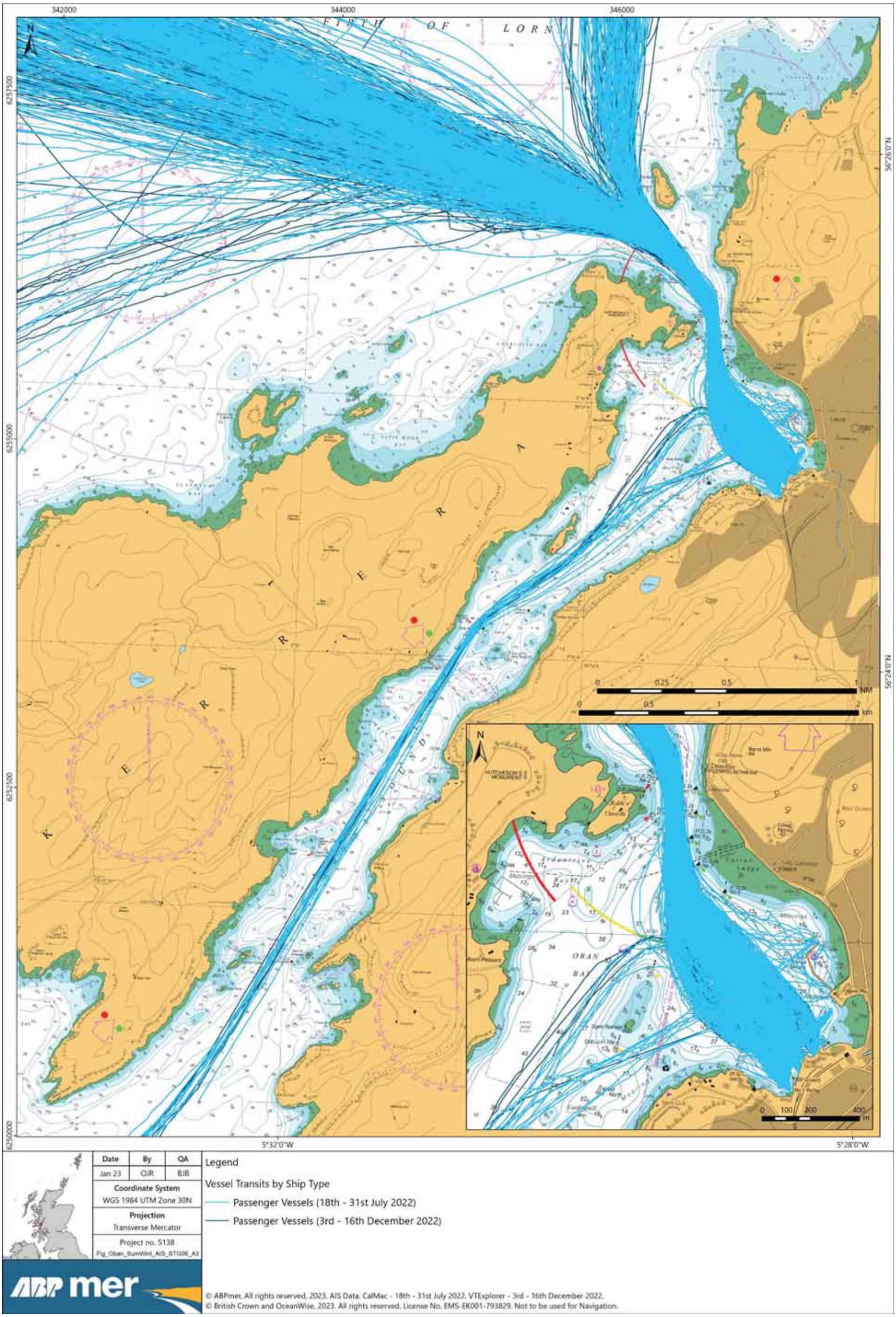


Figure B1. AIS Transits – Passenger vessels

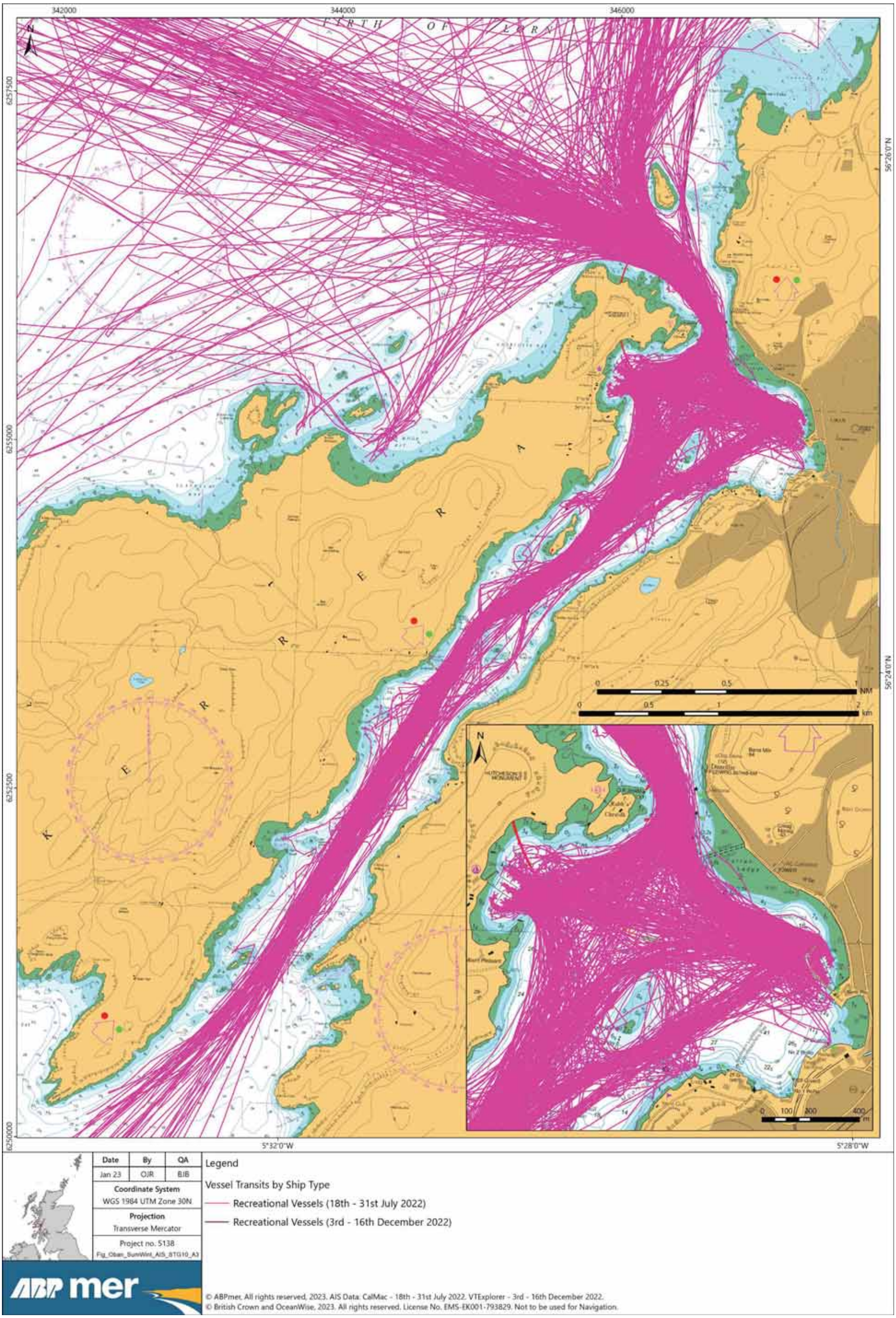


Figure B2. AIS Transits – Recreational vessels

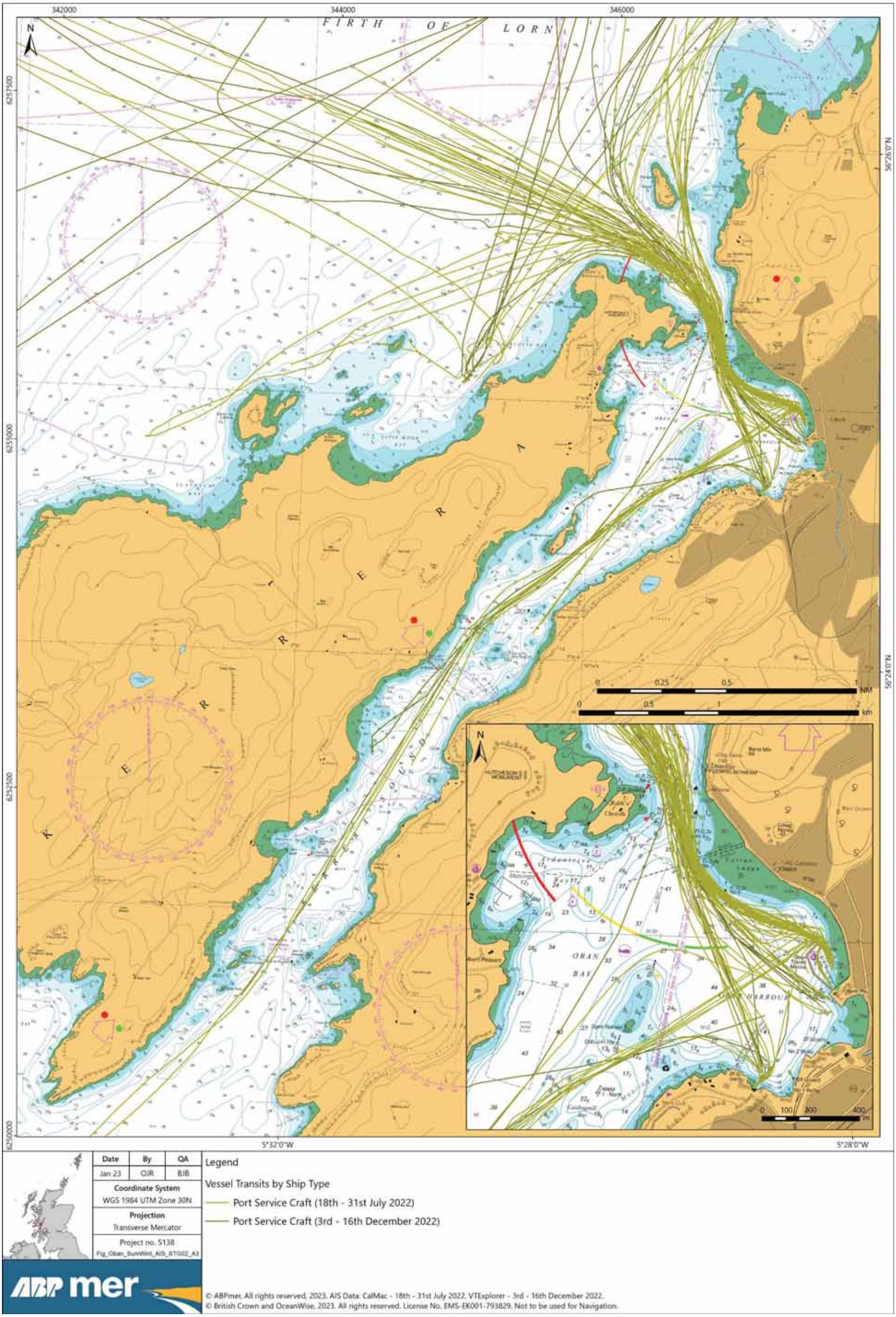


Figure B3. AIS Transits – Port service vessels

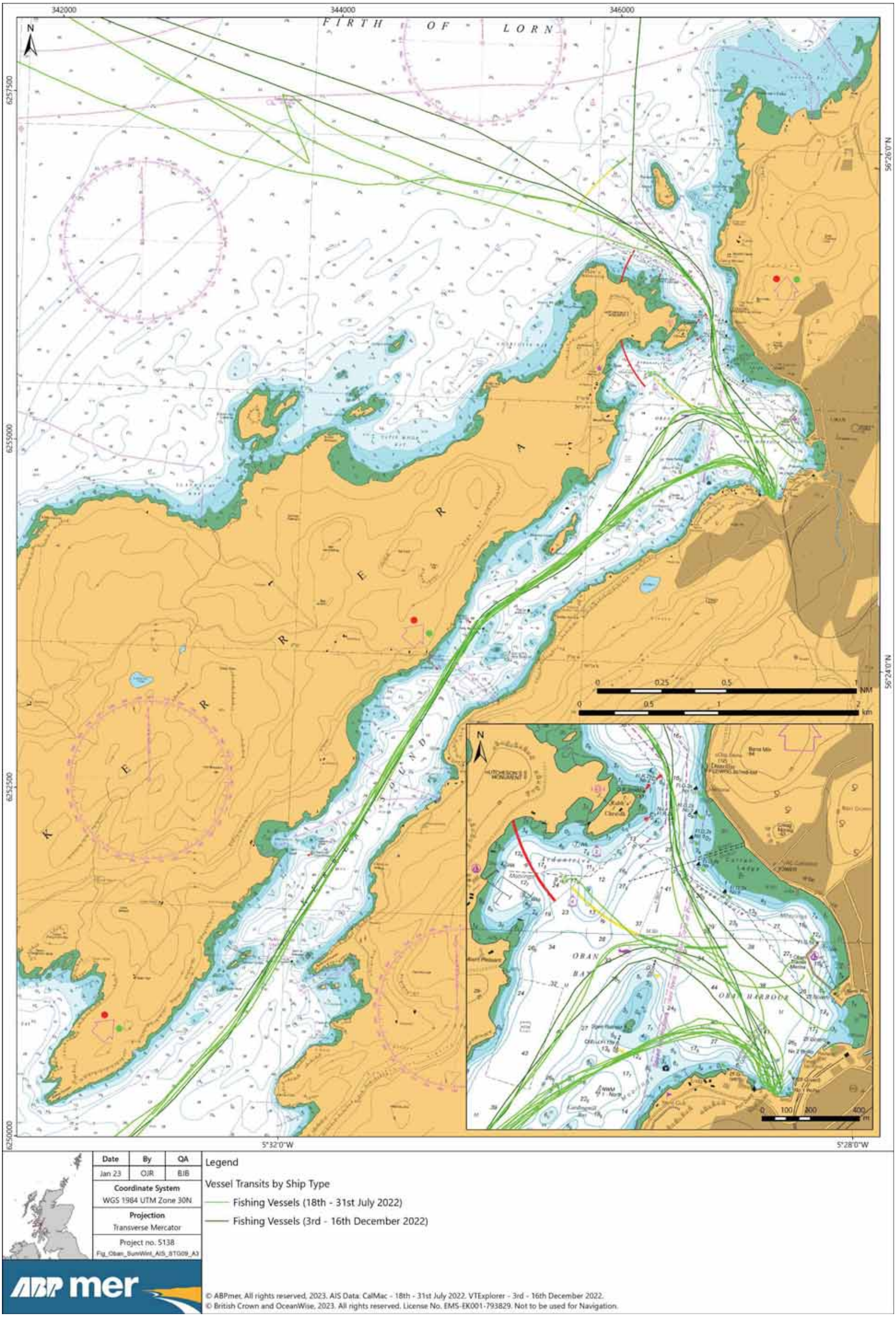


Figure B4. AIS Transits – Fishing vessels

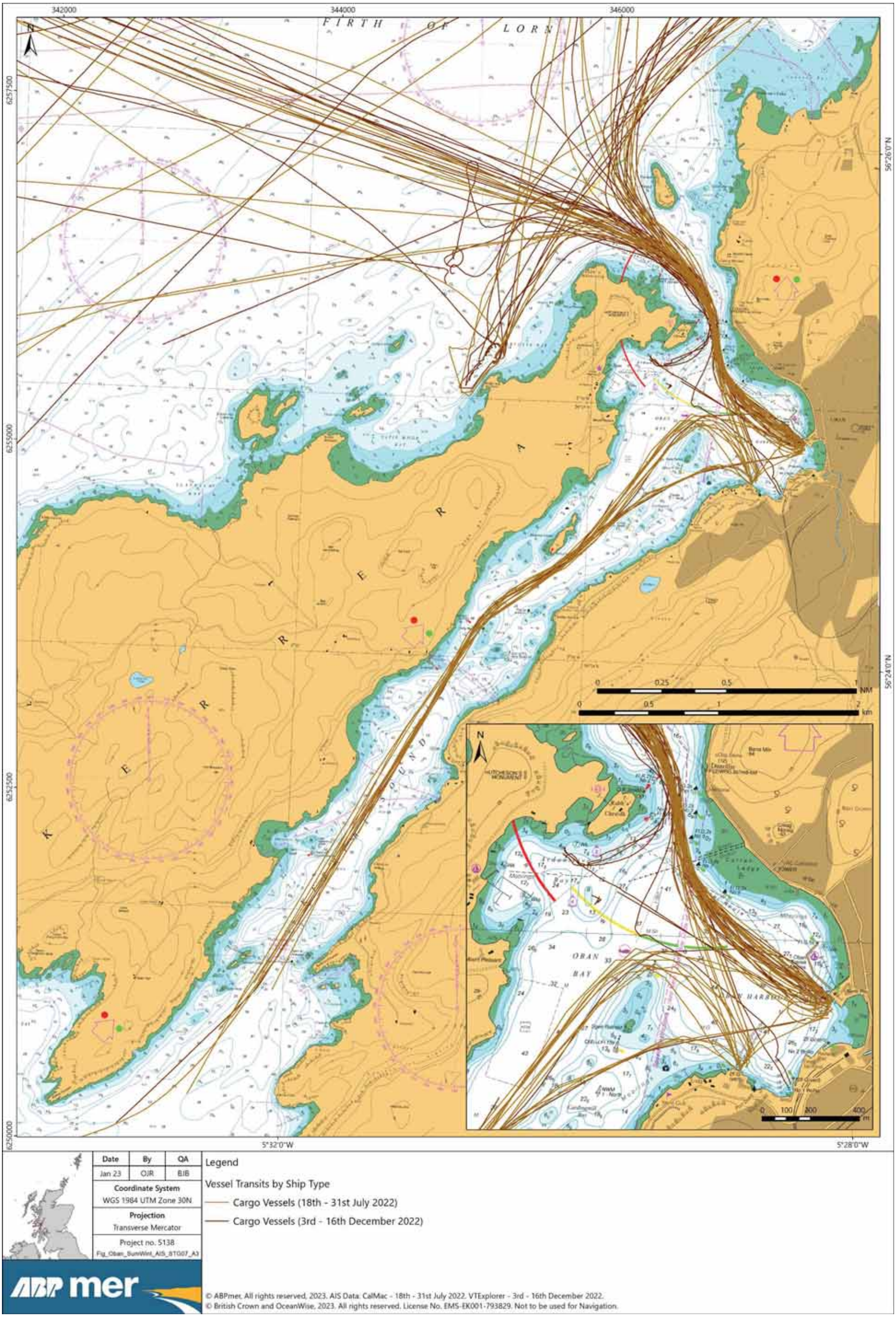


Figure B5. AIS Transits – Cargo vessels

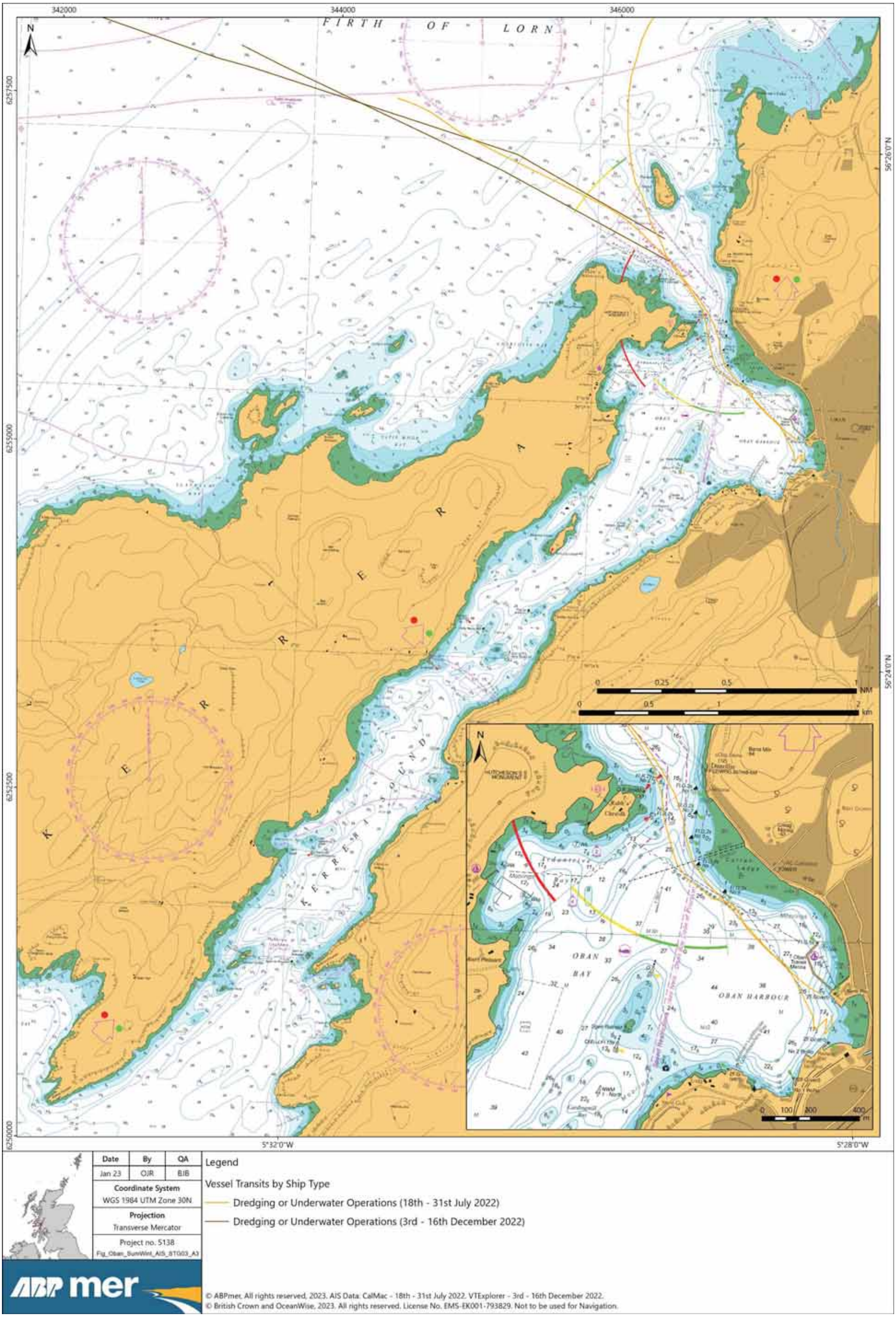


Figure B6. AIS Transits – Dredging vessels

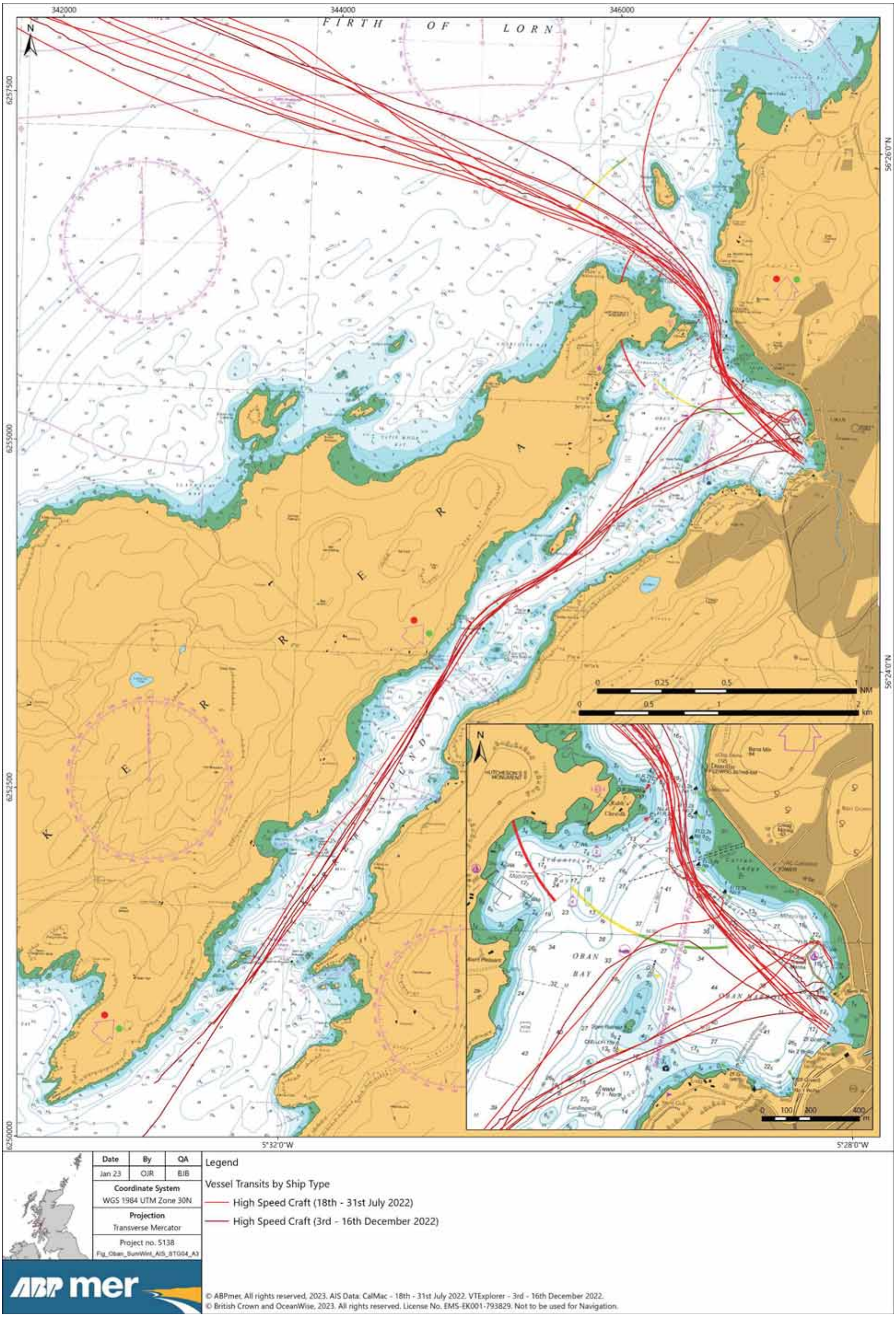


Figure B7. AIS Transits – High speed craft

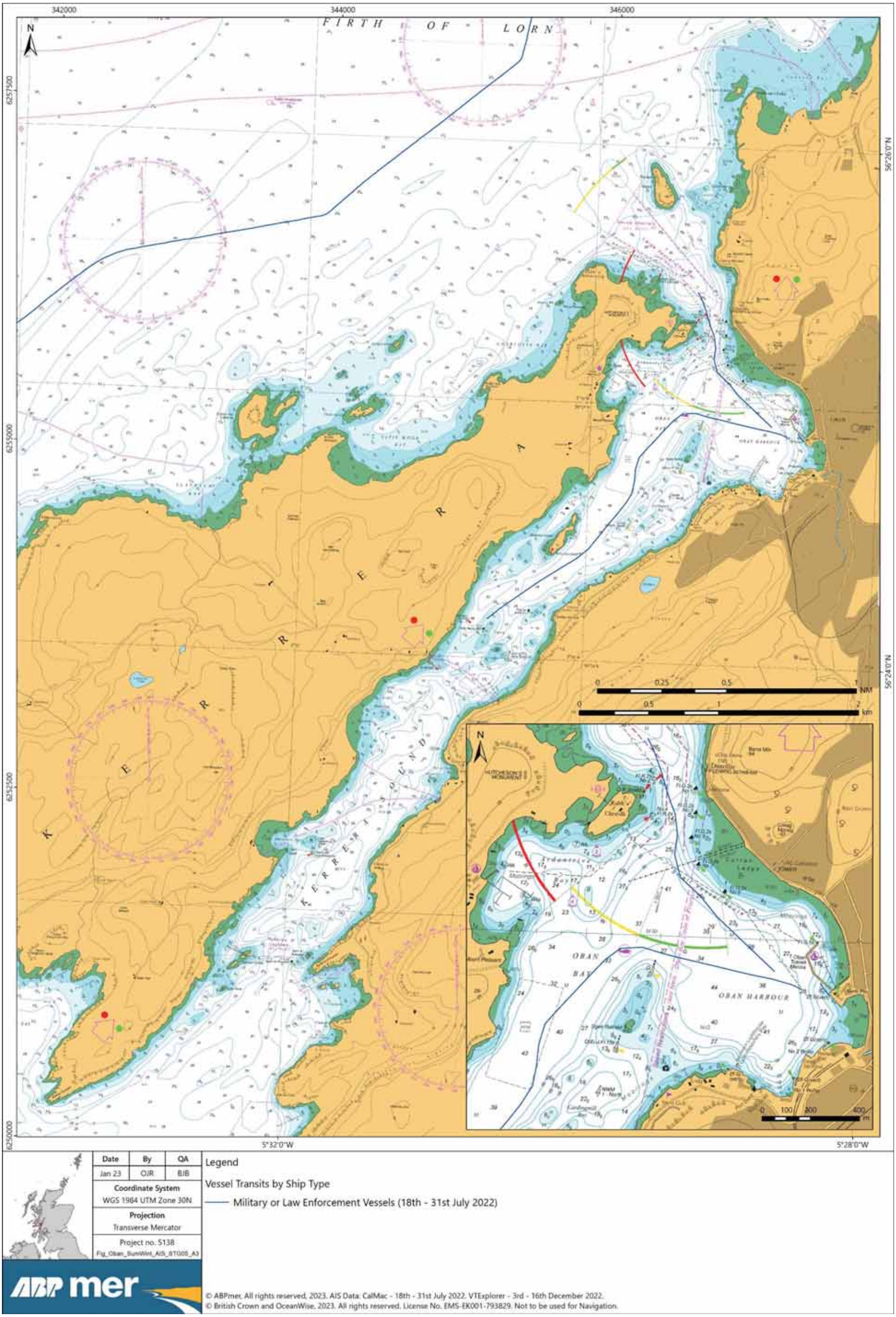


Figure B8. AIS Transits – Military/Law Enforcement vessels

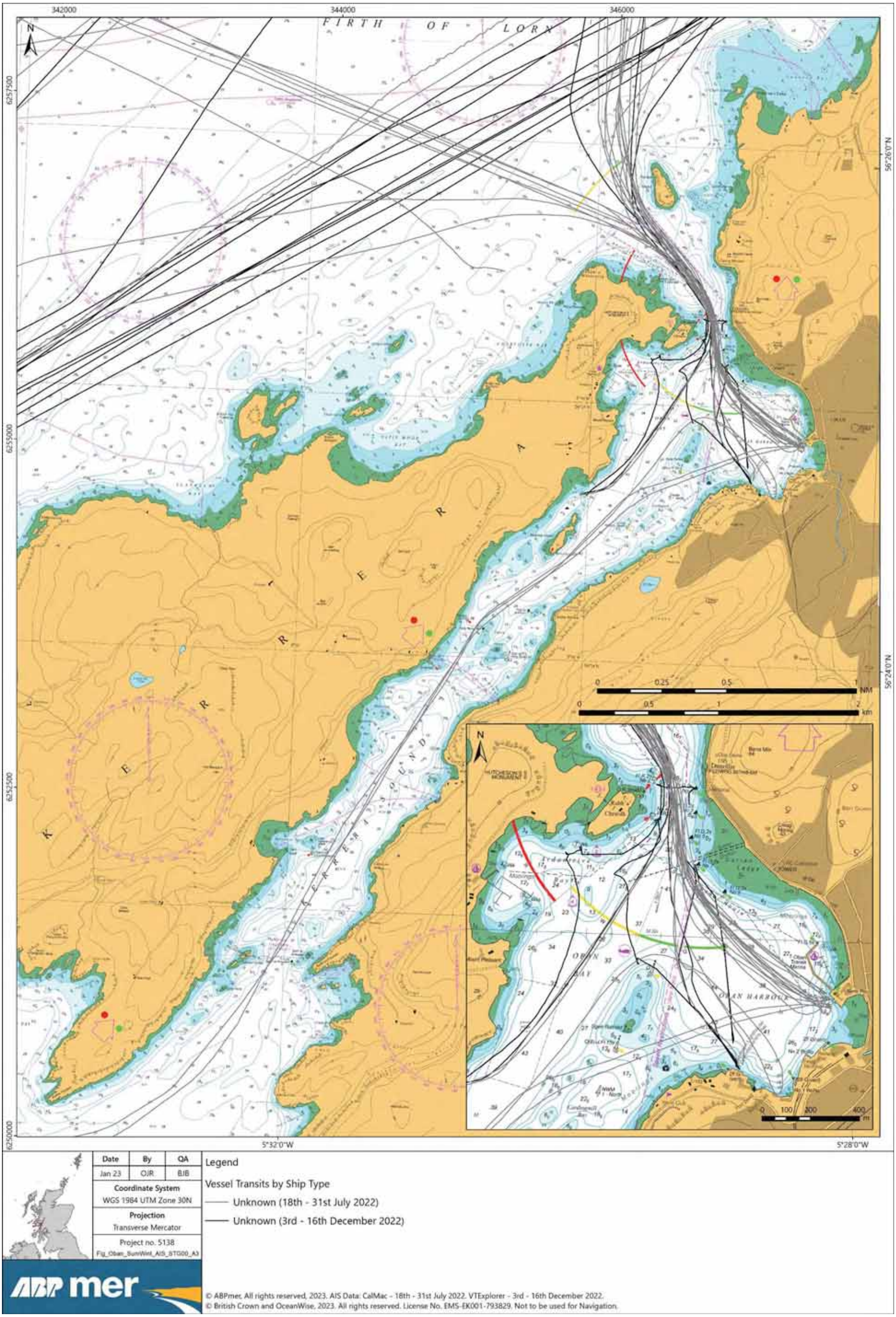


Figure B9. AIS Transits – Unknown vessels

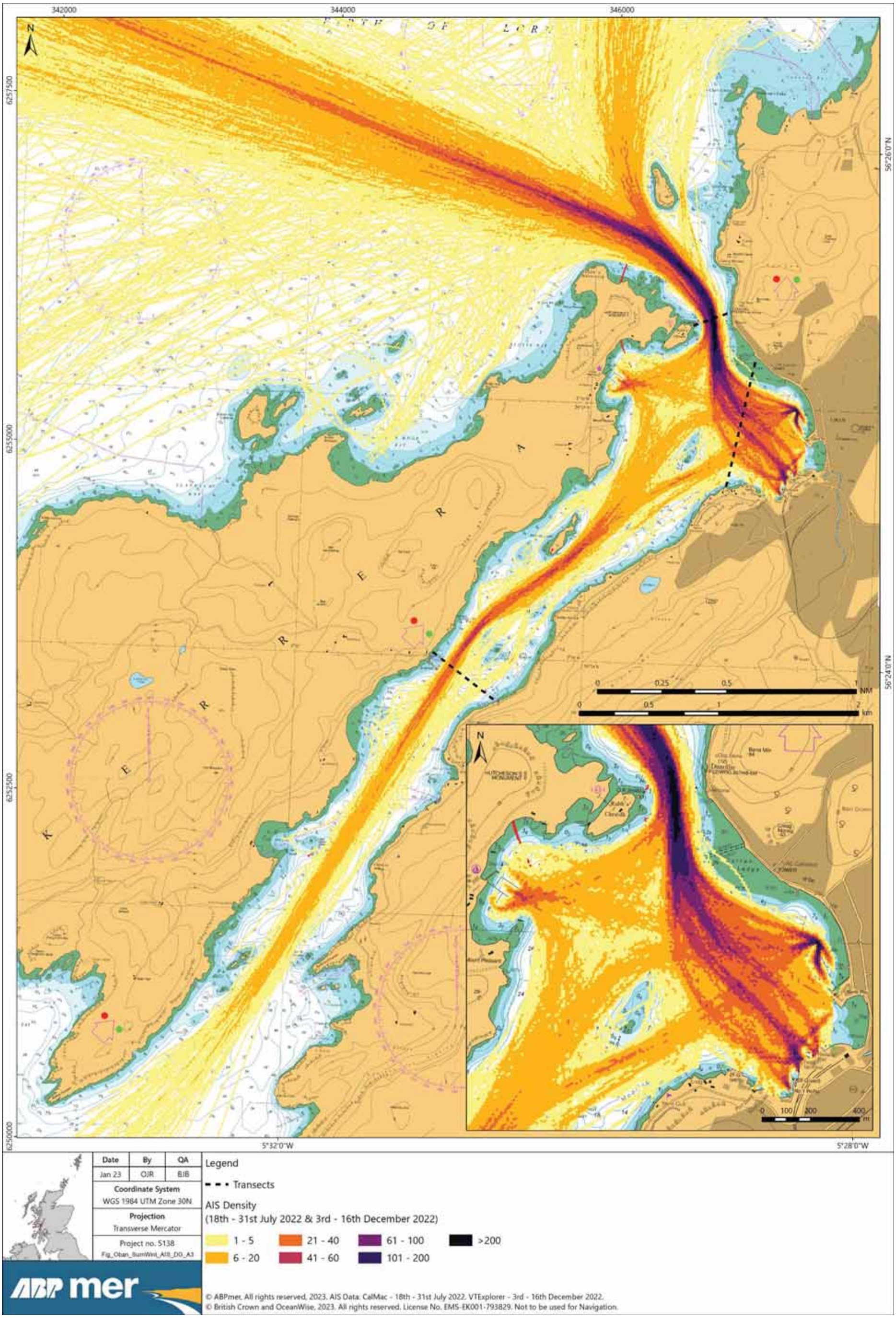


Figure B10. AIS Transits – Traffic density

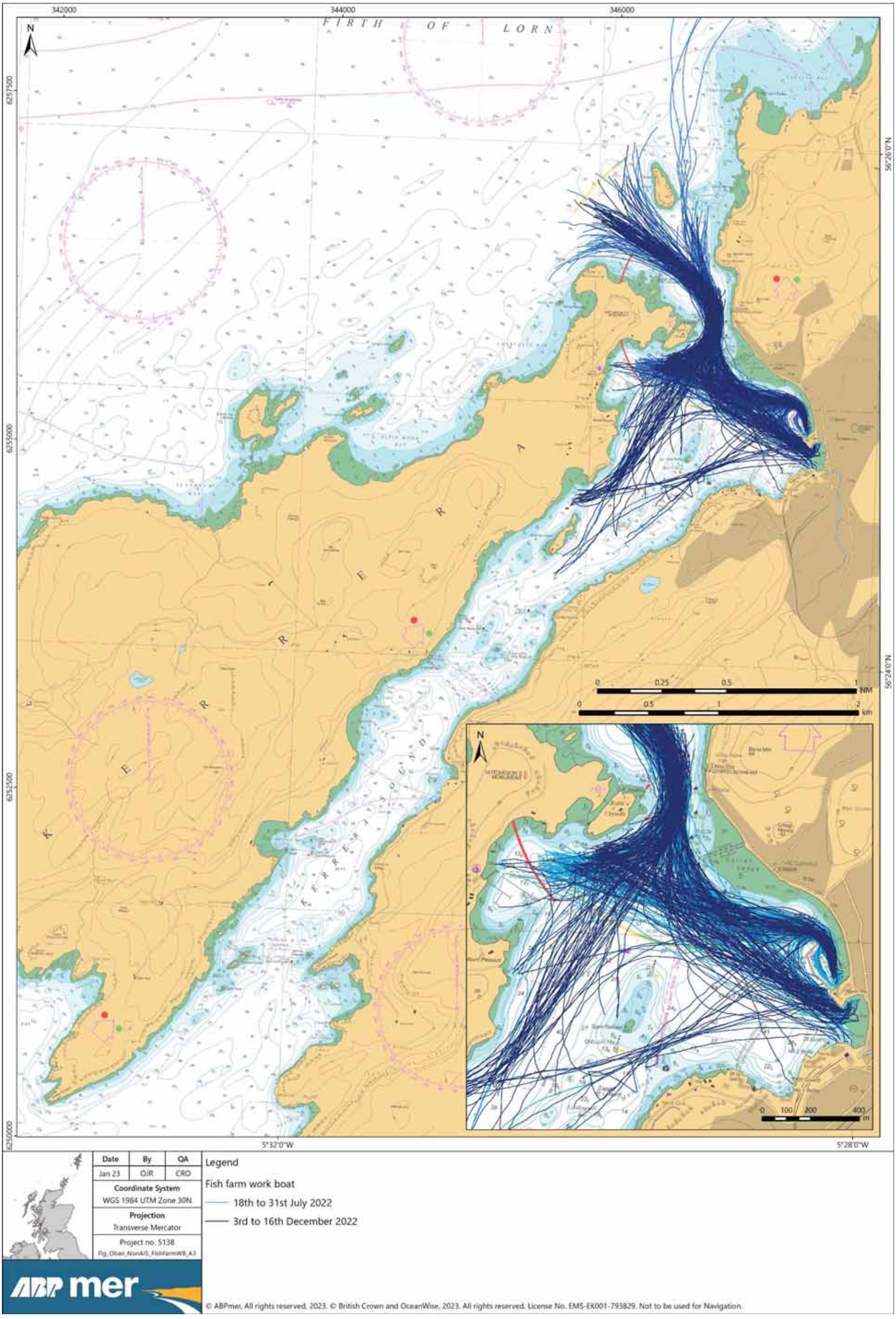


Figure B11. Non-AIS Transits – Fish farm vessels

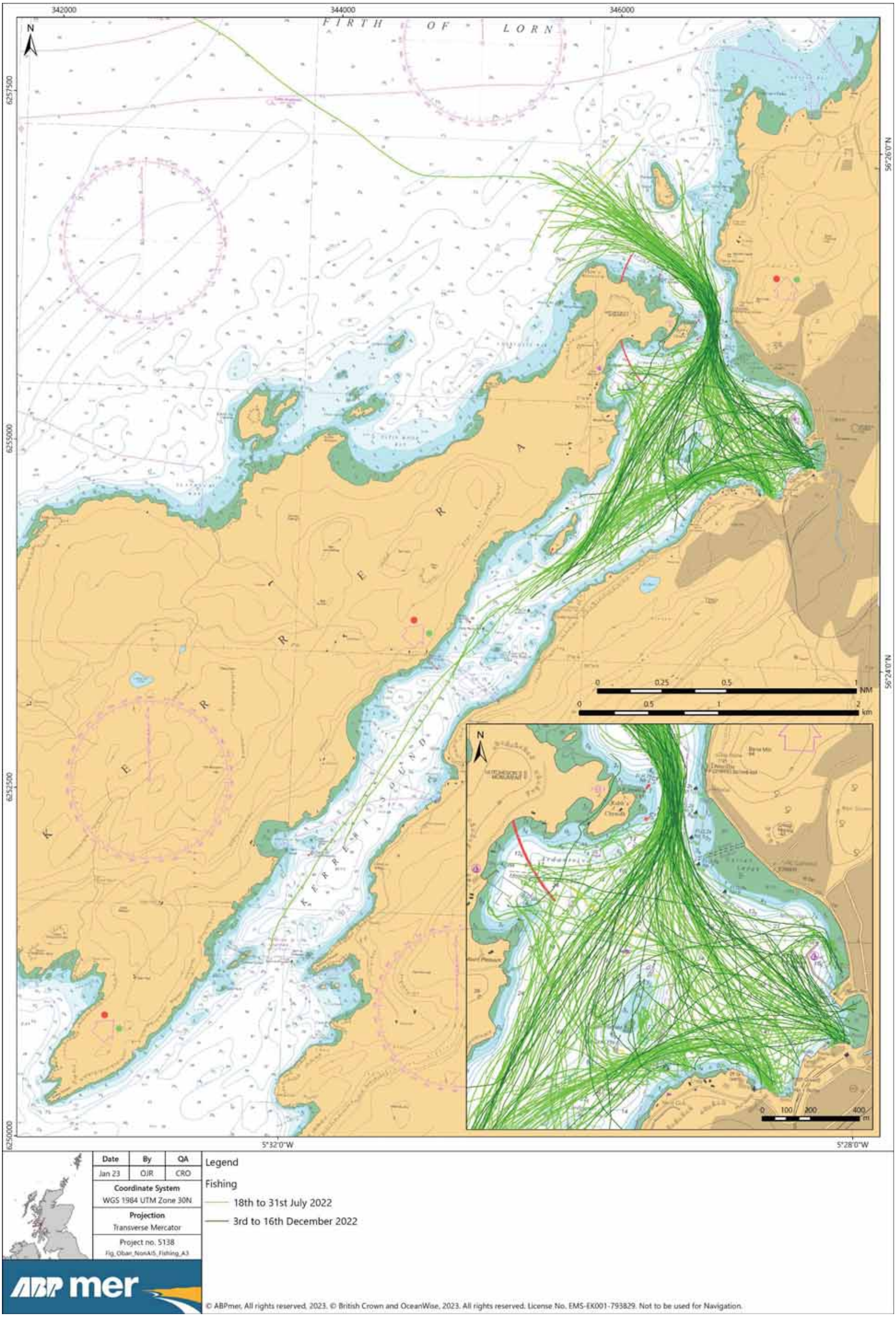


Figure B12. Non-AIS Transits – Fishing vessels

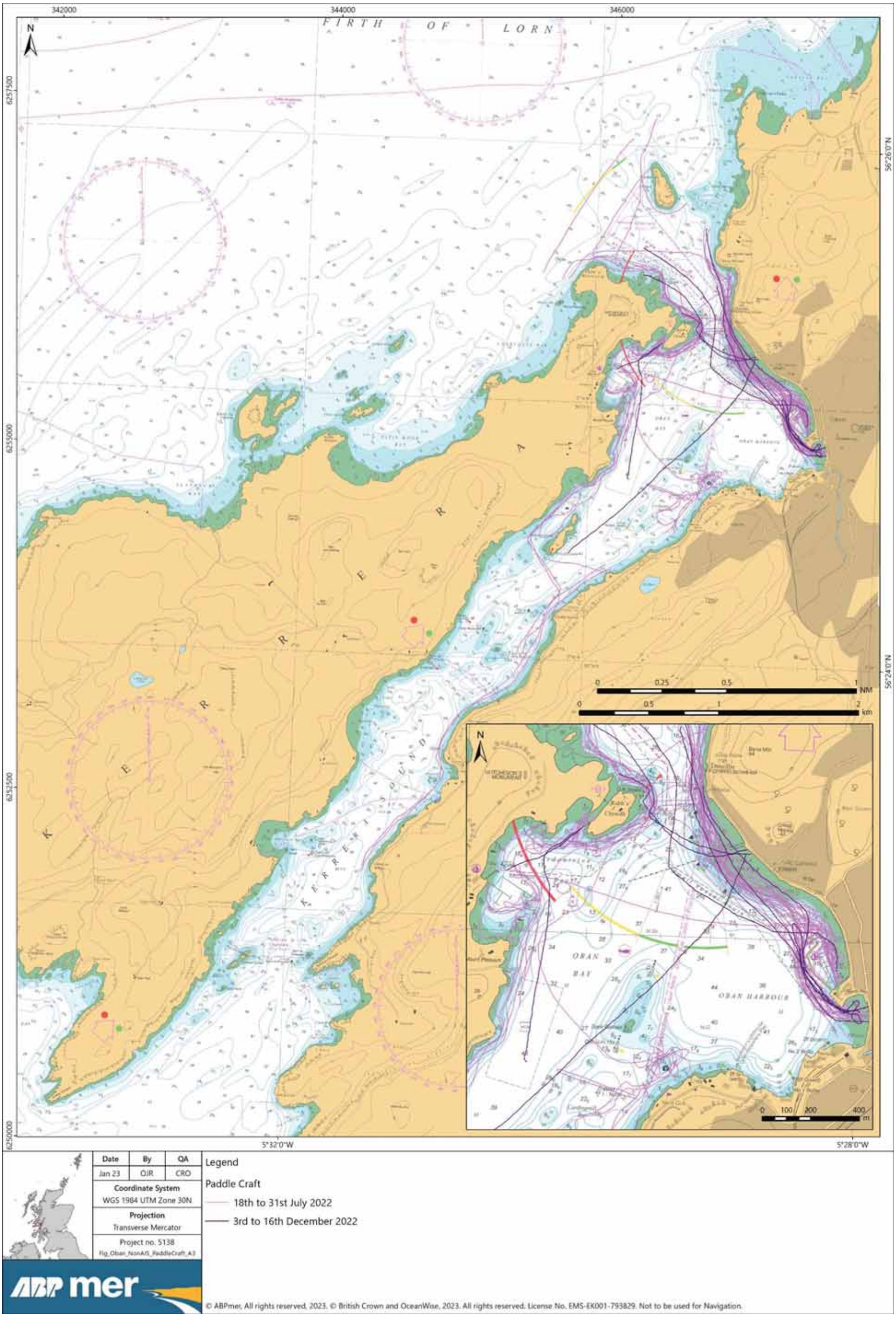


Figure B13. Non-AIS Transits – Paddlecraft

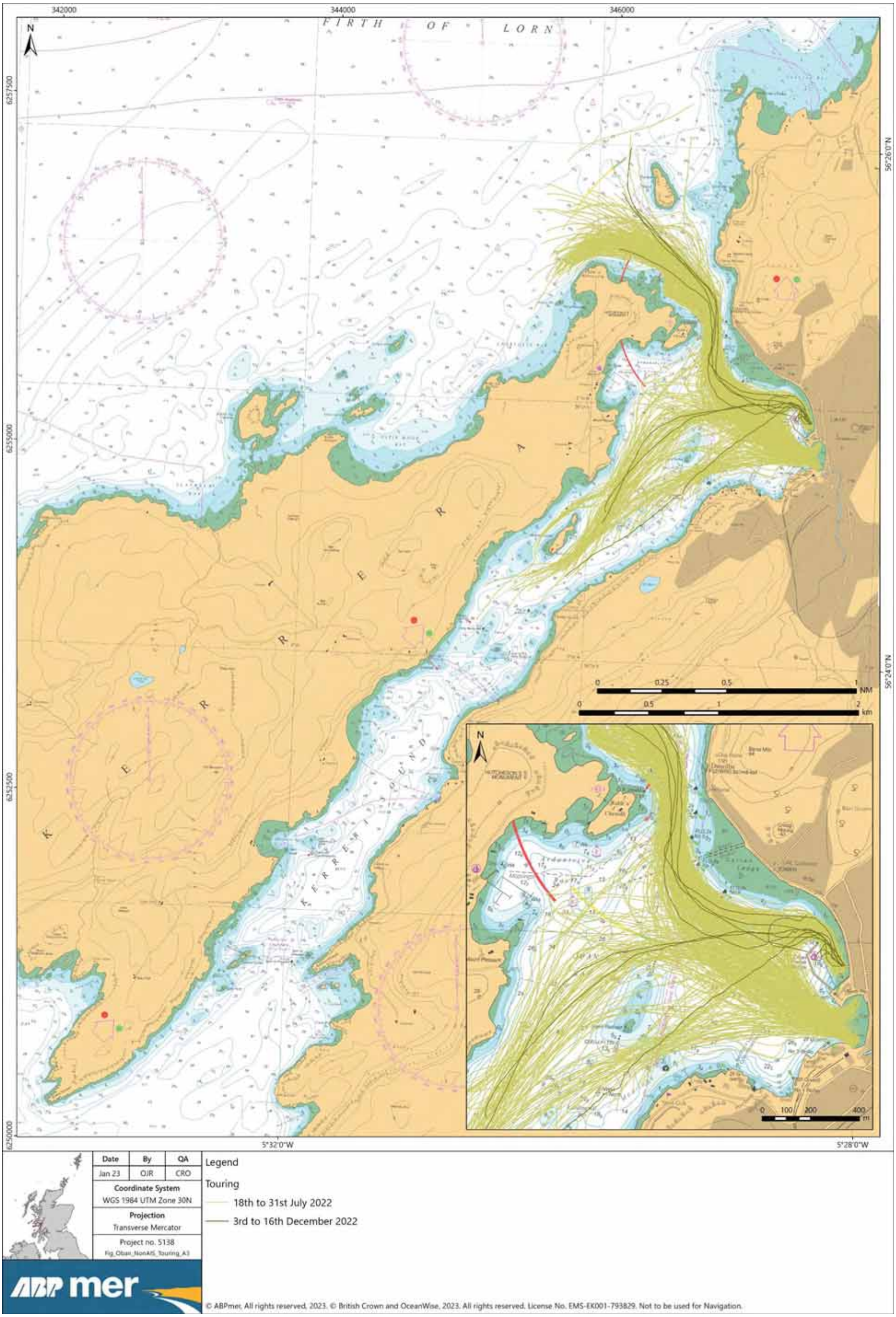


Figure B14. Non-AIS Transits – Tour vessels

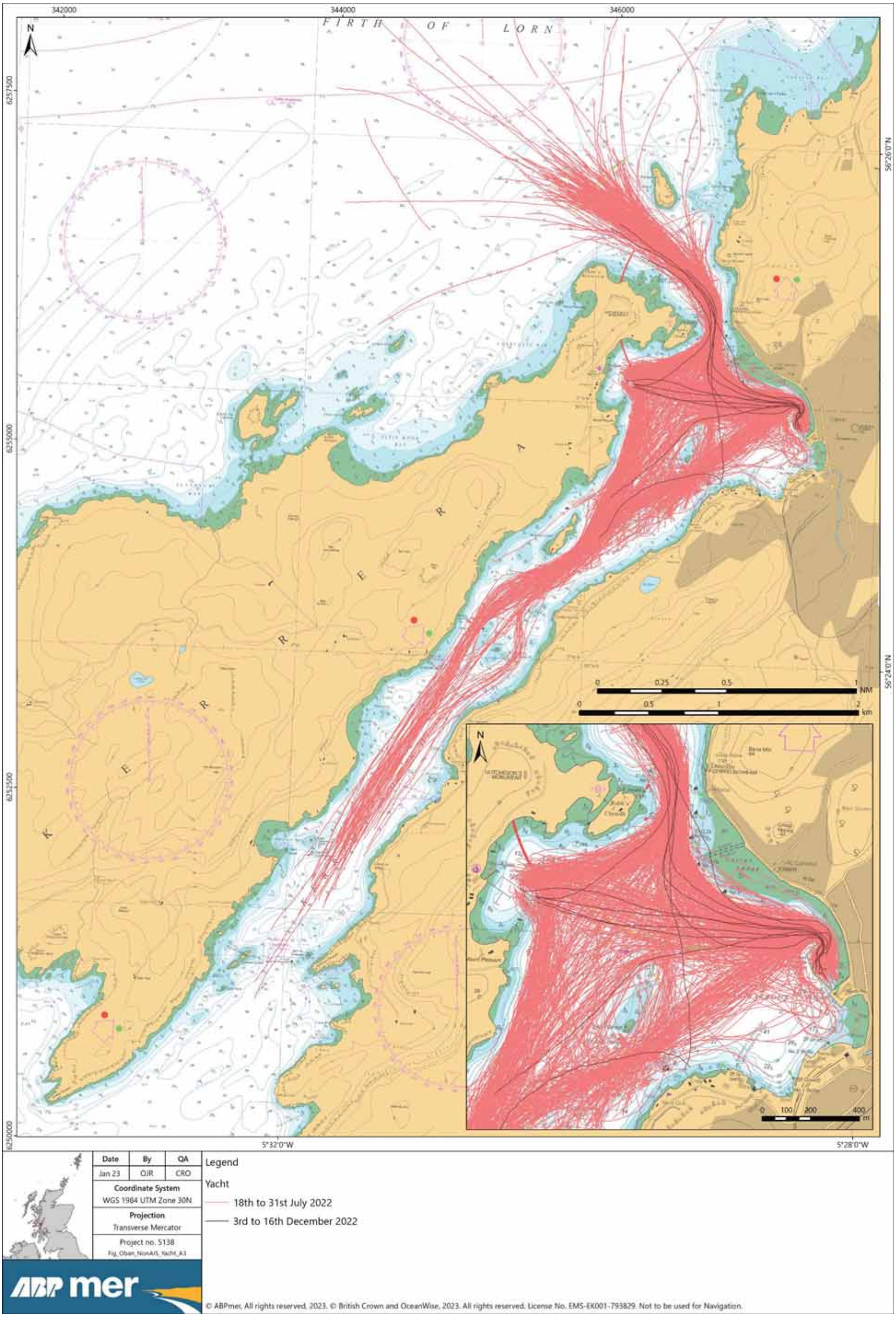


Figure B15. Non-AIS Transits – Yachting vessels

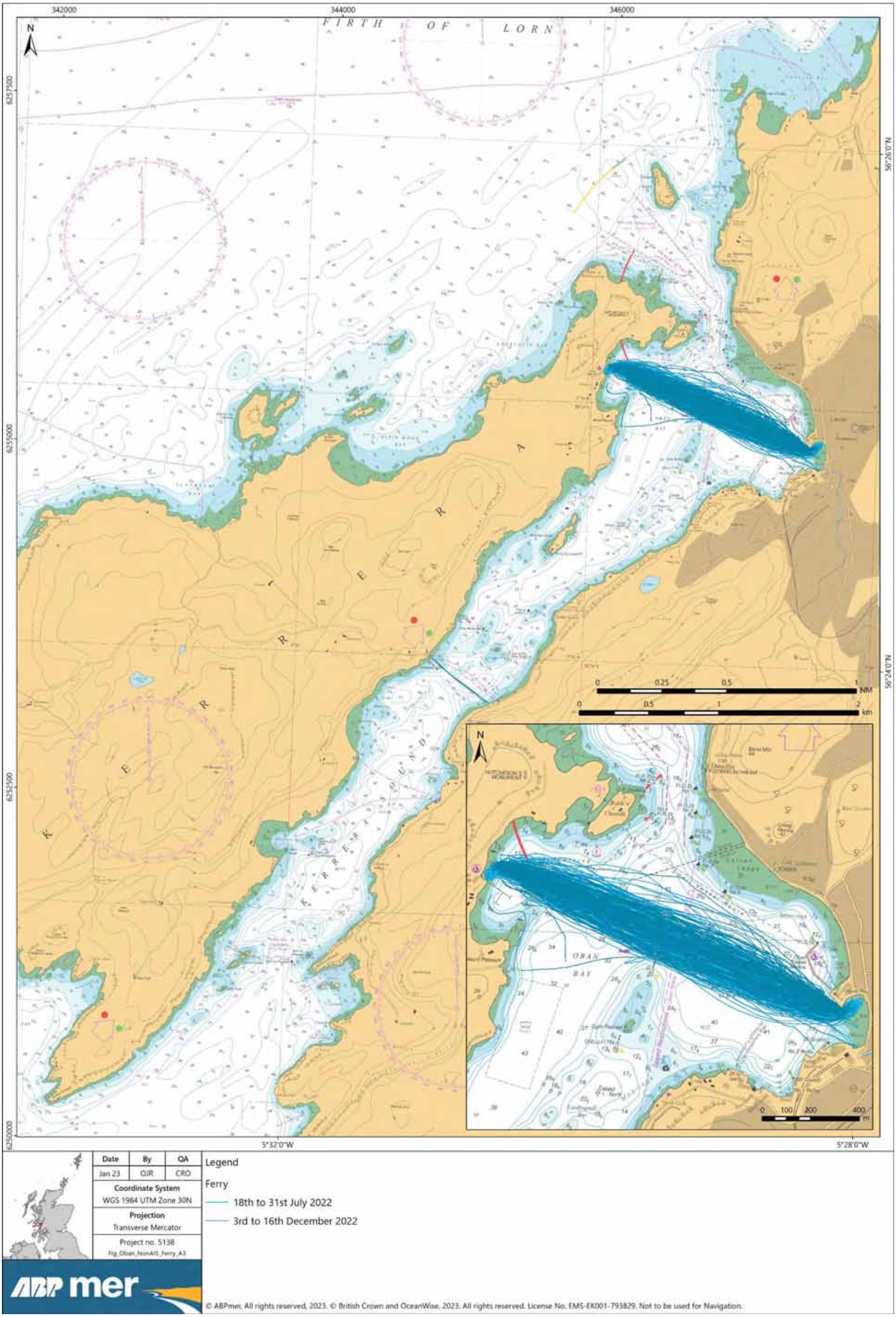


Figure B16. Non-AIS Transits – Ferries

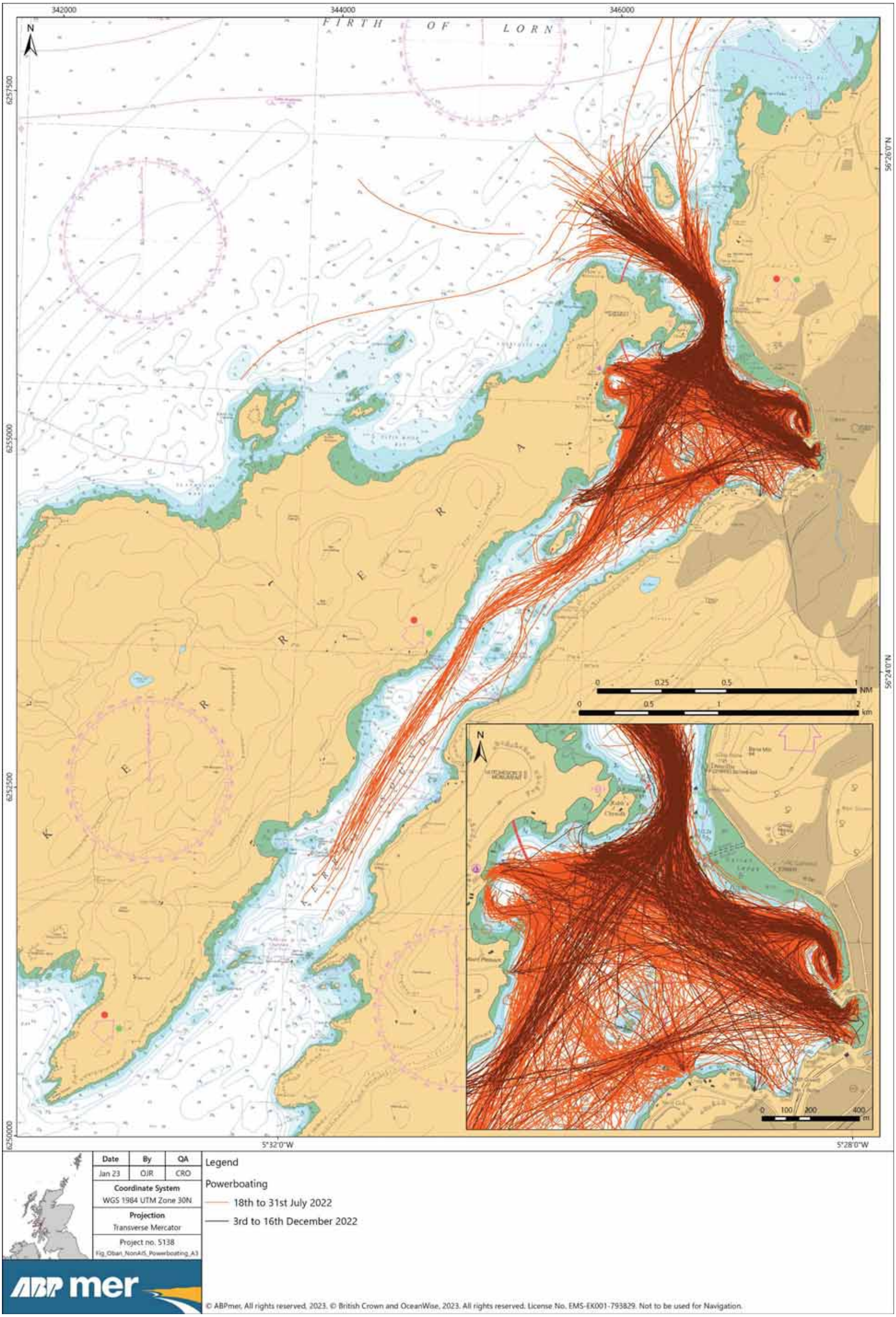


Figure B17. Non-AIS Transits – Powerboating

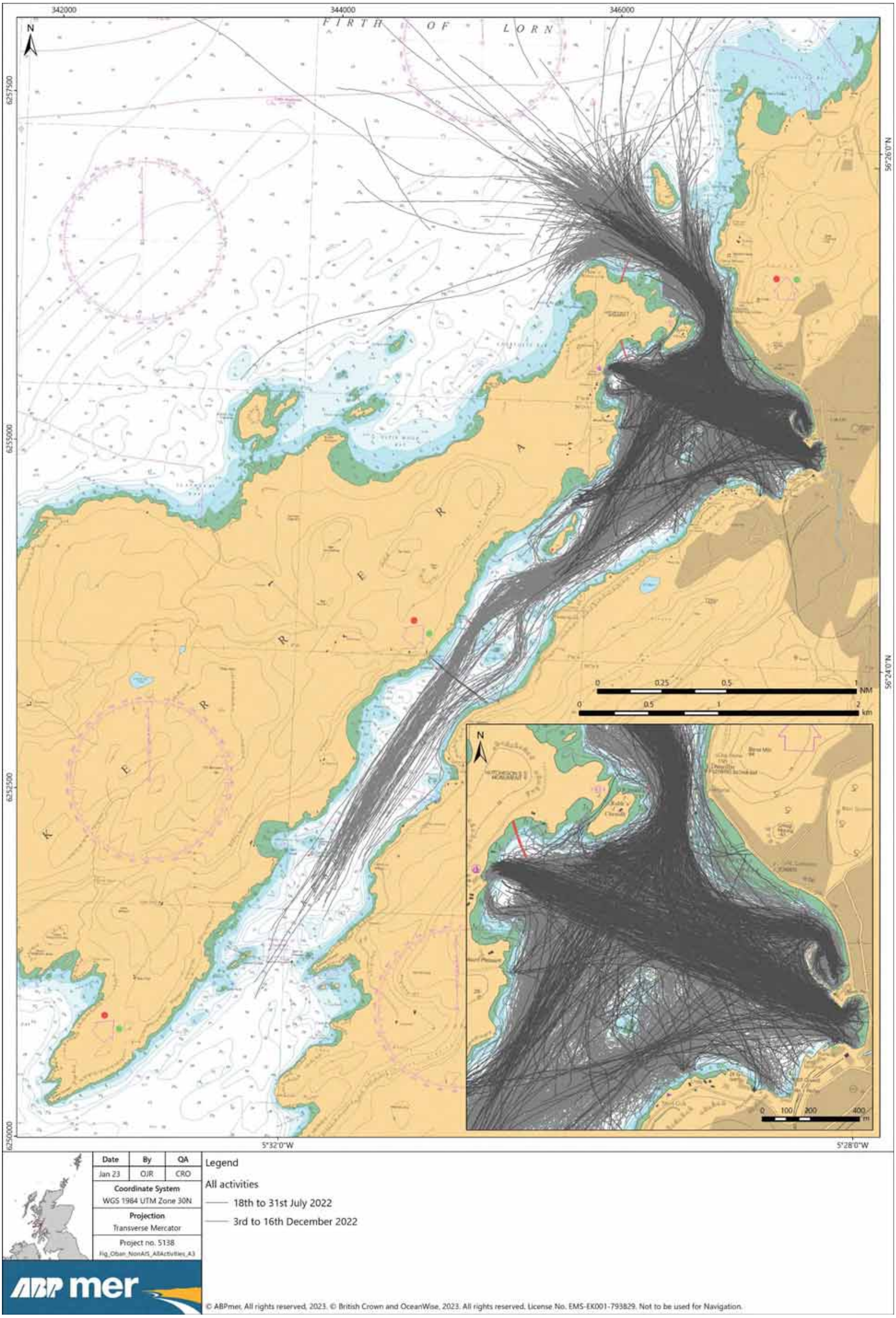


Figure B18. Non-AIS Transits – Overall

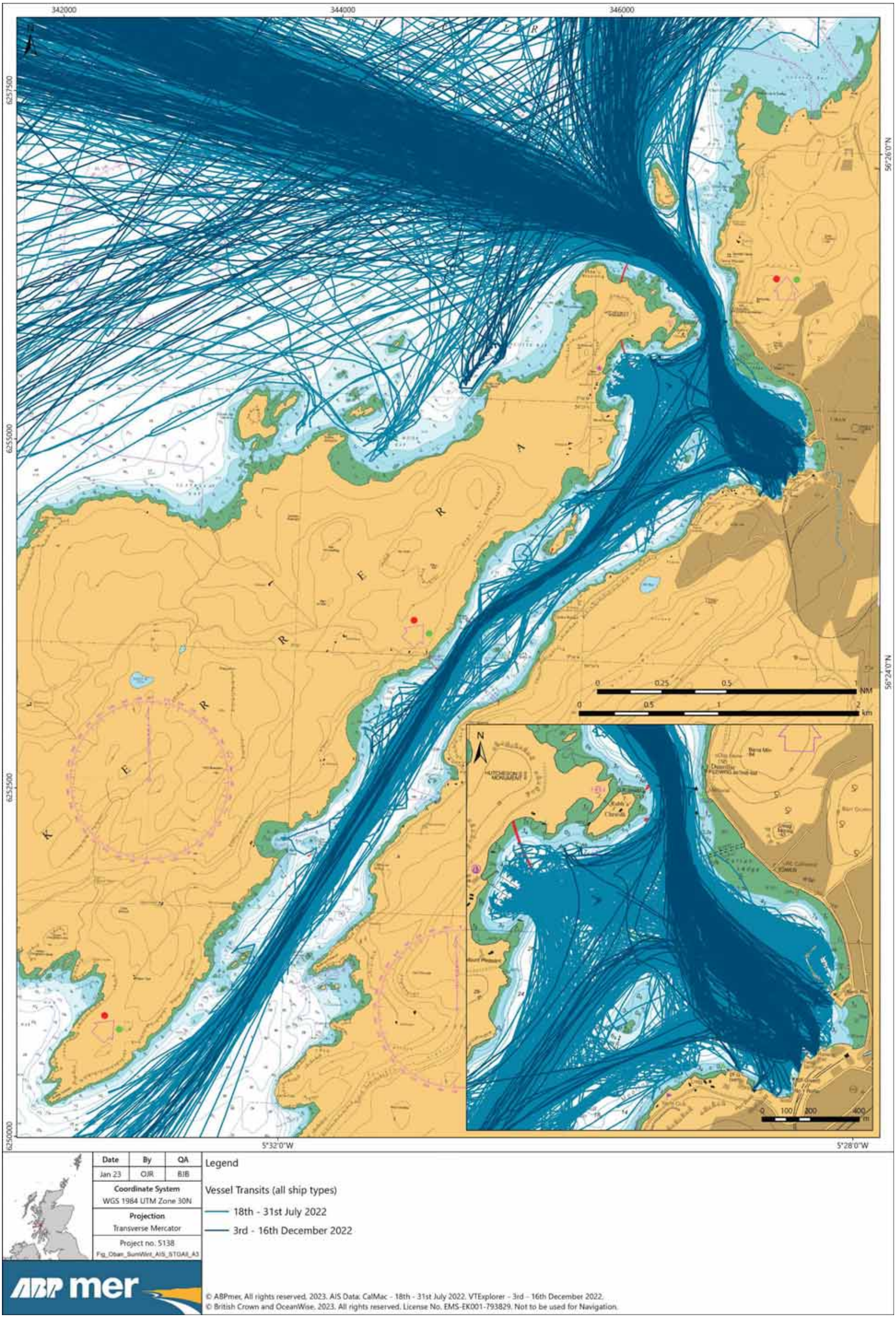


Figure B19. Vessel transits 2022 overview

C Navigational Risk Assessment

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
1	Air Pollution	Air Pollution	Vessel running engines and generator in Oban Harbour whilst alongside causes air emissions causing discomfort to public and harbour users. This occurs on still day so fumes stays dense and dissipates very slowly. No damage to property, minor injuries caused from fume inhalation and minor effect on environment. Moderate impact on port due to negative local publicity, effect on reputation and effect on local business.	1	1	0	2	2	Vessel running engines and generators causes minor air pollution. Minor discomfort caused to harbour users, but fumes dissipate quickly around harbour. No damage to property.	1	1	0	1	1	Sig	1	Human error/fatigue - Ship Personnel
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																75	Inadequate maintenance / inspection
																96	Lack of awareness
																108	Use of low grade fuel

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
15	Communications equipment	Harbour staff advise vessel to switch off engine	0%	5%	50%	5.23	5.13	Sig	24	Direction (Special) - Powers of Harbour/Pier Master	To allow polluting vessel to be moved in order to limit disruption	0%	10%	4.73	Mod
102	Vessel safety management system (ISM code)	Commercial vessels undergo regular maintenance	10%	0%	50%	5.33			79	Requirement for notification of vessel defects	To be written into the HRO	15%	0%	4.58	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
2	Accident to personnel	Recreational diving incident	Recreational diver is fatally injured after suffering an equipment failure. Media interest leading to adverse publicity.	25	3	0	0	4	Recreational diver has rapid ascent and has to go to a decompression chamber. There is little media attention and no pollution nor property damage.	10	2	0	0	1	Mod	26	Adverse weather conditions
																37	Failure to comply with Standard Operating Procedures
																48	Risk Assessment, Incomplete / not reviewed
																61	Incorrect assessment of tidal flow
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
14	Communications - traffic broadcast	Voluntary broadcasts on VHF 12 & 16	20%	0%	50%				16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.67	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.22			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.34	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.37			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions obtained in the HRO to control diving areas	20%	0%	4.06	
40	Harbour website	Advises against recreational diving in Oban Bay	5%	0%	10%	5.39			28	Education (harbour community information)	Education to user groups in harbour	10%	10%	3.66	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	5.81	5.03	Sig	39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.82	Low
									40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	2.76	
									113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.66	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	1.67	
									126	Permit/Licensing scheme	Controls over insurance, launching, age restrictions	15%	0%	1.49	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
3	Accident to personnel	Person in distress in the water	A person falls into water from quay edge. They drown resulting in a single fatality. There is no damage to property or the environment and a minor adverse reputational damage.	10	3	0	0	1	Person either falls into or ends up in water through choice (i.e. are swimming). They suffer cold water shock and minor injuries and are rescued either with the help of shore side or vessel based assistance.	1	1	0	0	0	Mod	26	Adverse weather conditions
																28	Restricted visibility
																43	Malicious action by external parties
																59	Inadequate procedures shoreside
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																96	Lack of awareness
																105	Mental health issues
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
11	CCTV Coverage	CCTV coverage of Oban Bay, not monitored	10%	0%	50%	4.20	4.16	Mod	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	20%	0%	3.96	Low
16	Contingency plan exercises	Covers Oban Bay	0%	10%	75%	4.41			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.64	
19	Council Emergency Plan (Local)	Limited to current harbour boundaries	0%	10%	10%	4.65			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.35	
132	Emergency services equipment - personnel	Policeman/Oban HM to stop persons when witnessed	50%	0%	25%	4.86			28	Education (harbour community information)	Increased education of harbour users	5%	0%	3.31	
30	Emergency services equipment - shore side	Life rings and ladders at required intervals according to ACOP	0%	15%	75%	5.17			86	Shore side signage	On what to do if someone is in water, to be included at pier	10%	0%	3.24	
85	Shore side facility maintenance programme	Includes maintenance of hand rails, barriers, ladders and life saving equipment for A&BC owned infrastructure	20%	10%	75%	5.40			113	Powers obtained through HRO	Ability to restrict swimming in operational areas	15%	0%	3.14	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	75%	5.75									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
4	Accident to personnel	Commercial diver in water whilst vessel manoeuvring in the vicinity.	Diver in the water is sucked into the thrusters of a vessel manoeuvring alongside leading to a fatality. Diving support crew incur serious injuries in rescue attempt. All ship operations in the incident area suspended. Media interest leading to adverse publicity.	50	3	0	0	3	Vessel approaches diver, sights diving flag and makes minimal use of thrusters. Close quarters (near miss) situation. Diver aware of the approaching vessel and gets out of the water. No injuries. Possible media attention.	10	0	0	0	1	Mod	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																23	Communication failure - operational/procedural
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																37	Failure to comply with Standard Operating Procedures
																48	Risk Assessment, Incomplete / not reviewed
																55	Incapacitated master (drinks/drugs)
																59	Inadequate procedures shoreside
																61	Incorrect assessment of tidal flow
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																88	Special Directions failure to follow / No power to give Special Directions
																94	Lack of visibility of craft/persons

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
14	Communications - traffic broadcast	Voluntary broadcasts on VHF 12 & 16	20%	0%	50%		3.31	Low	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.02	Neg
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	3.63			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.75	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	3.88			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	2.56	
40	Harbour website	Advises against recreational diving in Oban Bay	5%	0%	10%	3.90			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions obtained in the HRO to control diving areas	20%	0%	2.35	
57	Marine Safety Management System	A&BC MSMS controls diving operations	15%	0%	50%	3.98			28	Education (harbour community information)	Education to user groups in harbour	10%	10%	2.02	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	4.42			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	1.10	
117	Operator/Facility Controls	Diving at Work Regulations 1997 'HSE Guidance Commercial shellfish diving in inshore water'.	20%	0%	50%	4.54			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Promulgate changes to ferry services	5%	0%	1.07	
131	Dive Permits	A&BC and CMAL/CalMac issue dive permits	20%	0%	75%	4.68			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.09	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.43	
									126	Permit/Licensing scheme	Controls over insurance, launching, age restrictions	15%	0%	0.32	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
5	Accident to personnel	Vessel (ferry, cruise, cargo, fishing, yacht, RIB, powerboat) underway overruns a scallop diver.	Scallop Diver in the Sound of Kerrera or the northerly approaches to Oban Bay is overrun by a vessel. Scallop diver is fatally injured. All traffic in the incident area is suspended by a Temporary Exclusion Zone. Media interest leading to adverse publicity.	50	3	0	0	3	Scallop Diver in the Sound of Kerrera or the northerly approaches to Oban Bay, vessel approaches diver, sights diving flag and makes minimal use of thrusters. Close quarters (near miss) situation. Diver aware of the approaching vessel and gets out of the water. No injuries. Possible media attention.	10	0	0	0	0	Low	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																23	Communication failure - operational/procedural
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																37	Failure to comply with Standard Operating Procedures
																48	Risk Assessment, Incomplete / not reviewed
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																59	Inadequate procedures shoreside
																61	Incorrect assessment of tidal flow
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																88	Special Directions failure to follow / No power to give Special Directions
																94	Lack of visibility of craft/persons

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	2.57	2.06	Low	11	CCTV Coverage	Monitoring of CCTV coverage	10%	0%	1.99	Neg
14	Communications - traffic broadcast	Voluntary broadcasts on VHF 12 & 16	20%	0%	50%	2.72			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	1.82	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	2.78			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	1.67	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	2.78			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	1.57	
40	Harbour website	Advises against recreational diving in Oban Bay	5%	0%	10%	2.82			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions obtained in the HRO to control diving areas	20%	0%	1.45	
117	Operator/Facility Controls	Diving at Work Regulations 1997	20%	0%	50%	3.01			28	Education (harbour community information)	Education to user groups in harbour	10%	10%	1.27	
									39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	0.62	
									40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	0.60	
									113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	0.56	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.18	
									126	Permit/Licensing scheme	Controls over insurance, launching, age restrictions	15%	0%	0.15	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
6	Capsize/Sinking	Small vessel (yacht/RIB/Powerboat/paddle craft) swamped	Small craft swamps either from a large wave or wash and sinks in the harbour. There are multiple people on board leading to multiple fatalities and Tier 1 pollution results from the wreck. The wreck requires removing which is a moderate disruption and cost to the port. Negative local publicity	25	4	1	2	2	Vessel swamped during adverse weather or vessel wash leading to excess water needing to be bailed out. The vessel does not sink. There are no injuries, no pollution, no damage to property and no effect on the port.	5	0	1	0	0	Mod	1	Human error/fatigue - Ship Personnel
																7	Inadequate procedures in place onboard vessel
																9	Loss of watertight integrity
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																26	Adverse weather conditions
																43	Malicious action by external parties
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																57	Vessel Ramps or Hatches not secure
																61	Incorrect assessment of tidal flow
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																90	Excessive vessel speed
																92	Unsuitable ship design
																99	Lack of enforceable speed restrictions
																103	Derelict/Abandoned vessel

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	4.77	4.60	Mod	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	20%	0%	4.38	Neg
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	4.90			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.97	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.04			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.60	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	15%	15%	10%	5.43			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.47	
28	Education (harbour community information)	Details speed limits and how small craft should limit their interaction with larger vessels	0%	5%	75%	5.52			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.66	
39	Harbour patrol	Dory can assist with wreck removal	0%	10%	75%	5.71			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.42	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.90			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.00	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	80%	6.13			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.87	
95	Training of pollution response personnel		0%	20%	75%	6.40			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.99	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	20%	0%	50%	6.65			126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.85	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	15%	75%	6.90									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
7	Collision	Paddle craft with powered recreational craft (yacht/RIB/Powerboat)	Recreational powered craft collides with small paddle craft whether stand up paddleboard, kayak or canoe. The paddle craft user is knocked into the water and is struck by the vessel's prop. Potential to cause serious injury with loss of limb or a fatality. Serious negative national publicity, delay to port operations, no pollution.	25	3	1	0	3	Recreational powered craft and paddle craft either collide or come in to very close proximity with excessive wash causing the paddle craft user to be knocked into the water. Person is recovered from the water with minor injuries, potential for hypothermia. Little negative local publicity. No pollution and no damage to property. This is more likely to occur in areas of restricted space, e.g. the North Channel.	5	2	0	0	1	Hig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																9	Loss of watertight integrity
																16	Unplanned interaction with recreational craft
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																33	High traffic density
																38	Light pollution (backscatter)
																39	Vessel obstructing fairway
																43	Malicious action by external parties
																48	Risk Assessment, Incomplete / not reviewed
																55	Incapacitated master (drinks/drugs)
																56	COLREGS failure to comply
																61	Incorrect assessment of tidal flow
																68	Interaction
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																87	Notice to Mariners failure to observe
																90	Excessive vessel speed
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																99	Lack of enforceable speed restrictions

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
13	Communications - Stakeholder	Harbour User Group Meetings, including recreational groups	10%	0%	50%	4.83	4.79	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.45	Neg
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.12			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.14	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.43			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.99	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	5.52			28	Education (harbour community information)	Education around harbour use, dangers and rights of way given to recreational users	5%	5%	3.81	
28	Education (harbour community information)	Signage and leaflets available in harbour office	5%	0%	50%	5.54			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	3.02	
40	Harbour website	Guides and information for small craft	5%	0%	75%	5.57			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	3.00	
45	International COLREGS 1972 (as amended)		20%	0%	50%	5.68			86	Shore side signage	Shore side signage detailing dangers and what to do if either they are in difficulty or they spot someone who is	5%	0%	2.97	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	5%	50%	5.95			94	Training - Local regulations and powers	Training of port staff in local regulations and also correct advice to give to recreational harbour users	10%	10%	2.62	
95	Training of pollution response personnel		0%	10%	75%	6.20			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	15%	1.92	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.70			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.78	
									120	Zoning	Paddle sports only zones to provide traffic separation, e.g. zoning of Corran ledges	20%	0%	1.53	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.83	
									126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.66	
									127	Signage for vessels	Signage warning vessels entering busy areas	10%	0%	0.56	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
8	Collision	Recreational (power or sail) craft with large vessel (ferry, cruise, cargo, large fishing)	A recreational craft breaks down or drifts into the channel and collides with transiting large vessel causing the recreational vessel to be holed and sinks. Multiple fatalities to people on recreational craft. Tier 2 pollution from the recreational craft's bunkers. Limited damage to the large vessel. Serious national publicity and minor disruption to the ferry schedule.	50	4	2	3	3	Small craft's hull is damaged but watertight integrity is not compromised. Small craft can return to harbour to make repairs. Large vessel is undamaged. Serious injuries to small craft's crew. No pollution. No effect on marine traffic movements. Media interest leading to local adverse publicity.	10	2	2	0	1	Vhi	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																16	Unplanned interaction with recreational craft
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																56	COLREGS failure to comply
																72	Failure to follow passage plan
																75	Inadequate maintenance / inspection
																80	Human error
																86	Competence
																94	Lack of visibility of craft/persons
																95	Inappropriate manning of vessels
																99	Lack of enforceable speed restrictions

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	5.93	5.63	Sig	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	4.96	Neg
14	Communications - traffic broadcast	Voluntary vessel made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	50%	6.18			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.58	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	6.41			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.24	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	6.63			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.97	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	7.03			28	Education (harbour community information)	Recreational users education on rights of way and small vessel channel	5%	0%	3.90	
28	Education (harbour community information)	Signage and leaflets available in harbour office	5%	0%	75%	7.15			33	Exclusion zone	Moving exclusion zone around vessels entering/leaving Oban Bay through North Channel	25%	0%	3.54	
40	Harbour website	Guides and information for small craft	10%	0%	75%	7.40			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.51	
45	International COLREGS 1972 (as amended)		20%	0%	50%	7.95			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	2.47	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	8.15			52	Local Port Service - Harbour Control Office	Harbour control office appropriately equipped and manned to meet the scale of harbour activity	15%	15%	1.71	
63	Passage planning	Expectation that all vessels will use a passage plan	10%	0%	75%	8.48			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	1.43	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	8.79			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	15%	0.81	
95	Training of pollution response personnel		0%	10%	75%	8.85			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	0.71	
102	Vessel safety management system (ISM code)		10%	10%	75%	9.10			120	Zoning	Small vessel channel clearly advised	20%	0%	0.67	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	15%	5%	50%	9.33			122	Emergency Towage	Appropriate workboat/tug to assist towage	0%	15%	0.54	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	9.38			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.12	
									126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.00	
									127	Signage for vessels	Signage warning vessels entering busy areas	10%	0%	-0.06	
									128	Restricted visibility routine	Limit on speed and departure/arrival for large vessels, regular traffic information dissemination	25%	0%	-0.14	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
9	Collision	Recreational vessel (yacht/RIB/Powerboat/paddle craft) with fishing	Fishing vessel transiting harbour area collides with a recreational craft. The recreational craft's hull is damaged and its users are knocked into the water resulting in a fatality. The recreational craft sinks due to damage. The fishing vessel has minor damage. National adverse publicity and minor pollution from recreational crafts bunkers.	25	3	2	1	3	Fishing vessel transiting harbour area, with no one at the helm, collides with a recreational craft. Both vessels suffer a glancing blow due to the recreational vessel taking avoiding action. Minor damage to both vessels and minor injuries to people on board from the impact of collision. No pollution and minor adverse local publicity.	10	1	1	0	1	Vhi	1	Human error/fatigue - Ship Personnel
																3	Human error/fatigue - LPS Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																9	Loss of watertight integrity
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																16	Unplanned interaction with recreational craft
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																36	Failure of Aid to Navigation (out of position/unlit)
																37	Failure to comply with Standard Operating Procedures
																38	Light pollution (backscatter)
																39	Vessel obstructing fairway
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																56	COLREGS failure to comply
																61	Incorrect assessment of tidal flow
																68	Interaction
																76	Inadequate training / competence - Others
																80	Human error
																90	Excessive vessel speed
																92	Unsuitable ship design
																94	Lack of visibility of craft/persons
																95	Inappropriate manning of vessels
																96	Lack of awareness
																99	Lack of enforceable speed restrictions

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	4.98	4.69	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.30	Neg
14	Communications - traffic broadcast	Voluntary vessel made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	50%	5.23			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.95	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.55			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.69	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.90			28	Education (harbour community information)	Education to harbour users on how to make themselves more visible on the water	5%	0%	3.62	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	6.30			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.56	
28	Education (harbour community information)	Signage and leaflets available in harbour office	5%	0%	75%	6.42			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	2.51	
40	Harbour website	Guides and information for small craft	10%	0%	75%	6.67			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.22	
45	International COLREGS 1972 (as amended)		20%	0%	50%	7.22			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	15%	1.56	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	7.38			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.61	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	5%	50%	7.81			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.65	
95	Training of pollution response personnel		0%	10%	75%	8.00			126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.45	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	15%	5%	50%	8.39									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	75%	8.85									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
10	Collision	Sailing vessel with other sailing vessel	Two yachts collide resulting in one vessel being holed and sinking. Serious injury to crew. Considerable property damage to the two yachts and adverse local publicity. Minor pollution from fuel from yacht's bunkers.	50	3	3	1	2	Two yachts suffer glancing blow after colliding during a race. Minor damage to both vessels. Minor injuries to person on board yachts, little to no publicity and no pollution	1	1	1	0	0	Hig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																55	Incapacitated master (drinks/drugs)
																56	COLREGS failure to comply
																61	Incorrect assessment of tidal flow
																68	Interaction
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																90	Excessive vessel speed
																94	Lack of visibility of craft/persons
																95	Inappropriate manning of vessels
																99	Lack of enforceable speed restrictions
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	4.59	4.31	Mod	51	Local Port Service	Assisting with traffic control during busier periods	30%	20%	3.08	Neg
14	Communications - traffic broadcast	Voluntary vessel made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	50%	4.81			8	Availability of pollution response equipment	Review of pollution response equipment to cover the whole harbour area	0%	15%	2.61	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.11			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.20	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.44			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	1.92	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	5.78			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	1.73	
28	Education (harbour community information)	Signage and leaflets available in harbour office	5%	0%	75%	5.89			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	0.94	
40	Harbour website	Guides and information for small craft	10%	0%	75%	6.10			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	0.90	
45	International COLREGS 1972 (as amended)		20%	0%	50%	6.57			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	0.70	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	6.72			122	Emergency Towage	Assist in recovery of vessel	0%	15%	0.43	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	5%	50%	7.22			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.19	
95	Training of pollution response personnel		0%	10%	75%	7.38			126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.13	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	15%	5%	50%	7.94									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	75%	8.28									
115	Sailing Club's Controls	Including sailing event related traffic management and racing procedures	20%	20%	60%	8.70									
119	Other harbour users/vessels	Could offer assistance if in vicinity	0%	10%	25%	8.73									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
11	Collision	Impact with moored vessels	A large vessel (ferry, cruise, cargo, large fishing) transits south of the south cardinal mark towards the NLB Pier. This means the commercial vessel transits through the yacht club and guest visitor moorings nearby. The commercial vessel strikes several of the moored craft, specifically ones visiting with persons on board. This results in multiple fatalities, serious injuries and significant damage to the yachts. There is no pollution. Significant national adverse publicity and damage to reputation.	50	4	2	0	4	A yacht or small fishing vessel passes in between moored yachts striking one. There is minor damage to the paintwork but the cost is not greater than £10,000. There are no injuries or pollution. Minor adverse publicity and damage to reputation due to local boat owners suffering property damage and concern over the future safety of their vessels/visitor moorings.	10	0	0	0	1	Sig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																16	Unplanned interaction with recreational craft
																17	Anchored vessel represents a hazard
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																33	High traffic density
																37	Failure to comply with Standard Operating Procedures
																38	Light pollution (backscatter)
																41	Designated berth unavailable
																48	Risk Assessment, Incomplete / not reviewed
																55	Incapacitated master (drinks/drugs)
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																90	Excessive vessel speed
																91	Bridge ergonomics (poor bridge layout)
																99	Lack of enforceable speed restrictions
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	10%	10%	75%	4.25	4.13	Mod	4	Aids to navigation, Provision & maintenance of	AtoN marking the route as non a navigable	10%	0%	3.98	Neg
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	4.34			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.60	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	4.44			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.27	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	15%	0%	10%	4.52			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.07	
45	International COLREGS 1972 (as amended)		15%	0%	50%	4.61			25	Directions (General) - issued by Harbour Authority	General directions to be obtained from HRO	10%	0%	2.96	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	0%	50%	4.71			28	Education (harbour community information)	Mark channel as not navigable on information and leaflets	10%	0%	2.86	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	25%	0%	50%	4.91			39	Harbour patrol	Directs vessels away from channel			2.86	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	5.23			40	Harbour website	Mark channel as not navigable on information and leaflets	5%	0%	2.81	
117	Operator/Facility Controls	Including safety management system and trained personnel when vessel is commercial	20%	10%	50%	5.57			53	LPS broadcast (navigation and safety information)	Broadcasting channel not to be used	15%	0%	2.68	
									59	Notices to mariners	Issued around use of channel	15%	0%	2.57	
									112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.31	
									113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.22	
									118	Update UKHO chart	Update to remove channel	10%	0%	2.15	
									121	Pilotage	Compulsory Pilotage ensures channel not used	30%	15%	1.64	
									124	VTM - Seasonal Service	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	1.00	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
12	Collision	Seaplane (landing) collision with large vessel (ferry, cruise, cargo, large fishing).	Loss of seaplane, fatalities to seaplane crew and passengers. Aviation fuel pollution from seaplane's tanks, moderate damage to vessel's hull but vessel remains afloat. All traffic movement through the incident area suspended. Media interest leading to adverse publicity.	50	4	3	3	4	No damage to the vessel, which maintains passage with no loss of time. Seaplane incurs superficial damage (for example, to the wing or propeller). Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. No injuries. No pollution. Media attention.	25	0	1	0	1	Hig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																98	Inadequate procedures on seaplane

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	4.70	4.44	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.04	Neg
14	Communications - traffic broadcast	Voluntary vessel/seaplane made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	4.96			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.69	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.12			33	Exclusion zone	Around seaplane to ensure area is clear before take off and landing	30%	0%	3.16	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.23			39	Harbour patrol	Direct vessels and clear take off/landing zone	30%	15%	2.43	
45	International COLREGS 1972 (as amended)		10%	0%	75%	5.43			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.11	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.54			105	Voluntary code for safe navigation	Code to be compulsory	10%	0%	1.98	
63	Passage planning	Carried out by vessel and sea plane	20%	0%	75%	5.98			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	1.63	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	6.22			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.54	
95	Training of pollution response personnel		0%	10%	75%	6.34			124	VTM - Seasonal Service	Direct vessels and clear take off/landing zone	30%	15%	0.99	
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	50%	6.61									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.96									
114	Safety Management System	Seaplane has SMS	20%	0%	75%	7.55									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
13	Collision	Seaplane (landing) collision with small vessel (yacht/RIB/Powerboat/paddle craft).	Collision, capsize and sinking of seaplane (for example, loss of one or both floats) fatalities to seaplane crew and passengers. Aviation fuel pollution from seaplane's tanks. Loss of small vessel, loss of life on vessel. All traffic movement through the incident area suspended. Media interest leading to adverse publicity.	50	4	2	3	4	Slight damage to vessel and a fatality to one person in the small craft either due to them being struck by the sea plane of thrown in the water. Seaplane incurs superficial damage (for example, to the wing or propeller). Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. No injuries. No pollution. Media attention and severe negative publicity and reputational damage due to recreational craft's fear of safety being impacted by sea planes.	30	3	1	0	3	Vhi	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																98	Inadequate procedures on seaplane

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	6.15	5.70	Sig	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	5.23	Low
14	Communications - traffic broadcast	Voluntary vessel/seaplane made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	6.41			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.81	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	6.69			33	Exclusion zone	Around seaplane to ensure area is clear before take off and landing	30%	0%	4.28	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	6.75			39	Harbour patrol	Direct vessels and clear take off/landing zone	30%	15%	3.27	
45	International COLREGS 1972 (as amended)		10%	0%	40%	6.95			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.83	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	7.00			105	Voluntary code for safe navigation	Code to be compulsory	10%	0%	2.67	
63	Passage planning	Carried out by sea plane	15%	0%	75%	7.33			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.22	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	7.43			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.11	
95	Training of pollution response personnel		0%	10%	75%	7.46			124	VTM - Seasonal Service	Direct vessels and clear take off/landing zone	30%	15%	1.34	
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	40%	7.71									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	7.77									
114	Safety Management System	Seaplane has SMS	20%	0%	75%	8.33									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
14	Collision	Seaplane collides with vessel whilst taxiing.	Seaplane's wing and float on one side damaged. Seaplane lists to damaged side but remains afloat. Injury to crew and passengers, pollution from aviation fuel, slight damage to vessel's hull. All traffic movement through the incident area suspended. Media interest leading to adverse publicity.	50	2	2	3	4	Seaplane glances against the vessel's hull. No damage to the vessel. Vessel maintains passage with no loss of time. Seaplane incurs slight damage to wings. Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. No injuries. No pollution. Media attention.	25	0	1	0	1	Hig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																98	Inadequate procedures on seaplane

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	4.44	4.16	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.78	Neg
14	Communications - traffic broadcast	Voluntary vessel/seaplane made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	4.70			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.44	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	4.87			33	Exclusion zone	Around seaplane to ensure area is clear before take off and landing	30%	0%	2.88	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.02			39	Harbour patrol	Direct vessels and clear take off/landing zone	30%	15%	2.13	
45	International COLREGS 1972 (as amended)		10%	0%	50%	5.22			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	1.86	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.39			105	Voluntary code for safe navigation	Code to be compulsory	10%	0%	1.73	
63	Passage planning	Carried out by commercial vessel and sea plane	20%	0%	60%	5.83			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	1.38	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	6.19			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.29	
95	Training of pollution response personnel		0%	10%	75%	6.34			124	VTM - Seasonal Service	Direct vessels and clear take off/landing zone	30%	15%	0.75	
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	40%	6.61									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.96									
114	Safety Management System	Seaplane has SMS	20%	0%	75%	7.55									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
15	Collision	Seaplane (on take-off) collides with large vessel at speed.	With a northerly wind, a seaplane takes off into the wind (heading north) encounters an inbound vessel making passage through the entrance to Oban Bay. A collision leading to the loss of seaplane, fatalities to the crew and passengers, pollution from aviation fuel and possible fire. Damage to vessel's hull/superstructure. All traffic movement through the incident area suspended. Media interest leading to adverse publicity.	50	4	2	3	4	Seaplane glancing blow against the vessel. No damage to the vessel which maintains passage with no loss of time. Seaplane incurs minor damage. i.e. wing/floats. Seaplane can make an emergency landing. Delay to seaplane whilst checks made on airworthiness. No pollution. No injuries. Media interest.	25	0	1	0	1	Hig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																98	Inadequate procedures on seaplane

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	4.59	4.34	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.95	Neg
14	Communications - traffic broadcast	Voluntary vessel/seaplane made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	4.85			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.60	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.00			33	Exclusion zone	Around seaplane to ensure area is clear before take off and landing	30%	0%	3.06	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.12			39	Harbour patrol	Direct vessels and clear take off/landing zone	30%	15%	2.31	
45	International COLREGS 1972 (as amended)		10%	0%	75%	5.33			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.03	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.46			105	Voluntary code for safe navigation	Code to be compulsory	10%	0%	1.90	
63	Passage planning	Carried out by vessel and sea plane	20%	0%	75%	5.90			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	1.56	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	6.20			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.47	
95	Training of pollution response personnel		0%	10%	75%	6.34			124	VTM - Seasonal Service	Direct vessels and clear take off/landing zone	30%	15%	0.92	
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	50%	6.61									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.96									
114	Safety Management System	Seaplane has SMS	20%	0%	75%	7.55									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
16	Collision	Seaplane (on take-off) collides with small vessel (yacht/RIB/Powerboat/kayak) at speed.	With a northerly wind, a seaplane takes off into the wind (heading north). Small vessels (yacht/RIB/Powerboat/kayak) are mostly highly manoeuvrable, but also unpredictable. Potential for collision when taking off if the Master of the small craft has misjudged the seaplane's intentions. Collision, capsize and sinking of seaplane (for example, loss of one or both floats) fatalities to seaplane crew and passengers. Aviation fuel pollution from seaplane's tanks. Loss of small vessel, loss of life on vessel. All traffic movement through the incident area suspended. Media interest leading to adverse publicity.	50	4	2	3	4	Seaplane collision with small vessel, significant damage to vessel. Seaplane incurs superficial damage (for example, to the wing or propeller). Seaplane can proceed to base to disembark passengers under own power. Possible delay to seaplane whilst checks made on airworthiness. Minor injuries to small craft crew. No pollution. Media attention.	25	1	1	0	1	Hig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																98	Inadequate procedures on seaplane

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	4.80	4.53	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.12	Neg
14	Communications - traffic broadcast	Voluntary vessel/seaplane made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	5.08			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.75	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.24			33	Exclusion zone	Around seaplane to ensure area is clear before take off and landing	30%	0%	3.17	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.39			39	Harbour patrol	Direct vessels and clear take off/landing zone	30%	15%	2.40	
45	International COLREGS 1972 (as amended)		10%	0%	40%	5.60			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.11	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.76			105	Voluntary code for safe navigation	Code to be compulsory	10%	0%	1.97	
63	Passage planning	Carried out by sea plane	15%	0%	75%	6.11			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	1.60	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	6.45			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.50	
95	Training of pollution response personnel		0%	10%	75%	6.61			124	VTM - Seasonal Service	Direct vessels and clear take off/landing zone	30%	15%	0.92	
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	40%	6.88									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	7.30									
114	Safety Management System	Seaplane has SMS	20%	0%	75%	7.90									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
17	Collision	Seaplane strikes submerged/semi submerged object	Seaplane strikes a submerged object in the water resulting in the loss of the seaplane, and multiple fatalities to the seaplanes passengers/crew. Tier 2 pollution resulting from the aviation fuel and major adverse publicity and reputational damage.	50	4	2	3	4	Seaplane strikes submerged object in water whilst taxiing. It results in minor damage to the sea plane, a delay to operations, but no injuries nor pollutions. There is minor adverse publicity.	25	0	1	0	1	Mod	6	Inadequate bridge resource management
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																96	Lack of awareness
																97	Floating objects e.g. creel markers
																98	Inadequate procedures on seaplane

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	4.59	4.34	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.95	Neg
14	Communications - traffic broadcast	Voluntary vessel/seaplane made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	4.85			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.60	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.00			33	Exclusion zone	Around seaplane to ensure area is clear before take off and landing	30%	0%	3.06	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.12			39	Harbour patrol	Direct vessels and clear take off/landing zone	30%	15%	2.31	
45	International COLREGS 1972 (as amended)		10%	0%	50%	5.33			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.03	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.46			105	Voluntary code for safe navigation	Code to be compulsory	10%	0%	1.90	
63	Passage planning	Carried out by commercial vessel and sea plane	20%	0%	60%	5.90			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	1.56	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	6.20			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.47	
95	Training of pollution response personnel		0%	10%	75%	6.34			124	VTM - Seasonal Service	Direct vessels and clear take off/landing zone	30%	15%	0.92	
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	40%	6.61									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.96									
114	Safety Management System	Seaplane has SMS	20%	0%	75%	7.55									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
18	Collision	Jet skis at speed in harbour collision with another vessel or swimmer	Jet ski is travelling at speed collides with another vessel or swimmer. The jet ski driver is thrown into the water or at the structure and dies. There is damage to the jet ski but no environmental impact. Moderate damage to port reputation and disruption during the investigation into the fatality	25	3	1	0	2	Jet skis operating at full speed in the harbour cause disruption and distress to harbour users (including swimmers) and disrupts harbour operations. There is moderate damage to reputation, local and further spread due to high impact on visiting vessels.	1	0	0	0	2	Vhi	1	Human error/fatigue - Ship Personnel
																7	Inadequate procedures in place onboard vessel
																16	Unplanned interaction with recreational craft
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																56	COLREGS failure to comply
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																90	Excessive vessel speed
																96	Lack of awareness
																99	Lack of enforceable speed restrictions
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
4	Aids to navigation, Provision & maintenance of	AtoNs maintained by NLB	10%	0%	75%	4.78			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.41	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.05			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.13	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.34			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.95	
45	International COLREGS 1972 (as amended)		15%	0%	20%	5.45			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions to jet skis obtained in the HRO	10%	0%	3.84	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	5%	0%	50%	5.49	4.72	Mod	28	Education (harbour community information)	Increased education around use of jet skis	5%	0%	3.80	Low
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	75%	6.11			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	3.02	
									112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.65	
									113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.54	
									120	Zoning	No jet ski zones	15%	15%	2.06	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	1.31	
									126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	1.22	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
19	Collision	Sailing events and club activities	Yacht fleet, tacking into the wind racing out of Oban Bay meets with an incoming large vessel leading to collision with at least one of the racing fleet. Small craft is struck amidships by the bow of the large vessel and immediately sinks. No damage to large vessel. At least one fatality on-board the yacht. Small scale pollution from small craft's fuel tanks. All traffic movement into Oban Bay from the north suspended. Media interest leading to adverse publicity.	50	4	2	1	2	Yacht fleet, tacking into the wind racing out of Oban Bay meet an incoming large vessel leading to emergency avoidance by members of the sailing fleet, with glancing blows between sailing vessels. Small craft hull is damaged but watertight integrity is not compromised. Small craft can return to port to make repairs. Minor injuries to small craft's crew. No pollution. No effect on marine traffic movements. Media interest.	25	1	2	0	2	Vhi	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																12	Ship arriving before POB time/launch arrives late
																16	Unplanned interaction with recreational craft
																23	Communication failure - operational/procedural
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																33	High traffic density
																48	Risk Assessment, Incomplete / not reviewed
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																56	COLREGS failure to comply
																59	Inadequate procedures shoreside
																76	Inadequate training / competence - Others
																86	Competence
																87	Notice to Mariners failure to observe
																90	Excessive vessel speed
																96	Lack of awareness
																99	Lack of enforceable speed restrictions
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	5.05	4.88	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.46	Low
14	Communications - traffic broadcast	Voluntary traffic announcements on VHF 16 & 12	10%	0%	50%	5.24			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.08	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.44			39	Harbour patrol	Advising other water users of event	15%	0%	3.78	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.65			52	Local Port Service - Harbour Control Office	Direct response centrally in case of incident	0%	15%	3.27	
45	International COLREGS 1972 (as amended)		15%	0%	60%	5.97			53	LPS broadcast (navigation and safety information)	Of sailing event	15%	0%	3.02	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	6.20			59	Notices to mariners	Advising of sailing events	10%	0%	2.87	
63	Passage planning	Completed by commercial vessels	15%	0%	75%	6.57			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.58	
95	Training of pollution response personnel		0%	10%	75%	6.82			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.19	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	25%	10%	50%	7.81			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.06	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	25%	75%	8.20			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	1.05	
115	Sailing Club's Controls	Including sailing event related traffic management and racing procedures	20%	20%	60%	8.83									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
20	Collision	Tendering operation from anchored cruise vessel to shore disembarkation location,	Tender, with maximum number of passengers on-board, in collision with another tender/other vessel, then sinks. Crew and passengers enter the water. Fatalities, traffic movements in the incident area suspended. Media interest leading to adverse publicity. Minor pollution (tier 1) from tendering vessel's fuel tanks.	50	4	2	2	4	Tender in collision with another tender/other vessel, with maximum number of passengers on-board, takes on water on passage from a cruise vessel to the port. Crew and passengers slight injuries, transferred to another tender. Original tender recovered and lifted aboard the cruise vessel for inspection. No pollution. Media attention.	10	1	1	0	2	Vhi	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																12	Ship arriving before POB time/launch arrives late
																16	Unplanned interaction with recreational craft
																23	Communication failure - operational/procedural
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																33	High traffic density
																36	Failure of Aid to Navigation (out of position/unlit)
																39	Vessel obstructing fairway
																56	COLREGS failure to comply
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																82	AIS failure
																90	Excessive vessel speed
																91	Bridge ergonomics (poor bridge layout)
																92	Unsuitable ship design
																96	Lack of awareness
																99	Lack of enforceable speed restrictions

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	5.73	5.50	Sig	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	4.83	Neg
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	10%	0%	50%	5.91			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.44	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	6.09			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.10	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	6.28			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.82	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	15%	15%	10%	6.90			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions to jet skis obtained in the HRO	10%	0%	3.66	
45	International COLREGS 1972 (as amended)		20%	0%	60%	7.33			33	Exclusion zone	Moving exclusion zone around vessels entering/leaving Oban Bay through North Channel	25%	0%	3.31	
61	Oil spill contingency plans	Limited to current harbour boundaries	0%	10%	10%	7.58			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	3.25	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	0%	75%	7.98			52	Local Port Service - Harbour Control Office	Harbour control office appropriately equipped and manned to meet the scale of harbour activity.	15%	15%	2.64	
87	Standards of Training, Certification and Watchkeeping for Seafarers (STCW)		15%	0%	80%	8.43			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.38	
95	Training of pollution response personnel		0%	15%	75%	8.60			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.10	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	15%	5%	50%	8.98			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	1.98	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	9.10			121	Pilotage	Compulsory Pilotage to provide expert knowledge and ship handling skills	30%	15%	1.03	
129	Cruise vessel guidance	Guidance issued to Cruise Ships with suggested routes for tenders	20%	0%	90%	9.38			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.39	
									128	Restricted visibility routine	Limit on speed and departure/arrival for large vessels, regular traffic information dissemination	25%	0%	0.16	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
21	Collision	Small craft (not yacht) collision with commercial vessel	Small craft is struck amidships by the bow of the large vessel and immediately sinks. No damage to large vessel. Possibility of multiple fatalities on-board the yacht/RIB/Powerboat/paddle craft. Small scale pollution from small craft's fuel tanks. All traffic movement through the northern approaches is suspended. Media interest leading to adverse publicity.	50	4	2	2	3	Small craft's hull is damaged but watertight integrity is not compromised. Small craft can return to port to make repairs. Large vessel is undamaged. Minor injuries to small craft's crew. No pollution. No effect on marine traffic movements. Media interest leading to adverse publicity.	10	1	1	0	1	Vhi	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																16	Unplanned interaction with recreational craft
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																56	COLREGS failure to comply
																72	Failure to follow passage plan
																75	Inadequate maintenance / inspection
																80	Human error
																86	Competence
																94	Lack of visibility of craft/persons
																95	Inappropriate manning of vessels
																99	Lack of enforceable speed restrictions

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	5.01			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.34	
14	Communications - traffic broadcast	Voluntary vessel made announcements prior to entering and leaving on VHF 16 & 12	15%	0%	50%	5.27			11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	3.75	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.45			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.41	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.62			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.13	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	6.02			28	Education (harbour community information)	Recreational users education on rights of way and small vessel channel	5%	0%	3.05	
28	Education (harbour community information)	Signage and leaflets available in harbour office	5%	0%	75%	6.14			33	Exclusion zone	Moving exclusion zone around vessels entering/leaving Oban Bay through North Channel	25%	0%	2.68	
40	Harbour website	Guides and information for small craft	10%	0%	75%	6.39			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	1.69	
45	International COLREGS 1972 (as amended)		20%	0%	50%	6.94			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	1.65	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	7.12			52	Local Port Service - Harbour Control Office	Harbour control office appropriately equipped and manned to meet the scale of harbour activity.	15%	15%	1.16	
63	Passage planning	Expectation that all vessels will use a passage plan	10%	0%	75%	7.45	4.78	Mod	61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	0.94	Neg
95	Training of pollution response personnel		0%	10%	75%	7.64			107	Civil Contingency Plan	Is this covered by emergency plan	0%	10%	0.75	
102	Vessel safety management system (ISM code)		10%	10%	75%	8.21			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	15%	0.30	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	15%	5%	50%	8.79			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	0.21	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	9.18			120	Zoning	Small vessel channel clearly advised	20%	0%	0.34	
									122	Emergency Towage	Remove yacht from main channel	0%	15%	0.16	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	-0.16	
									126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	-0.22	
									127	Signage for vessels	Signage warning vessels entering busy areas	10%	0%	-0.25	
									128	Restricted visibility routine	Limit on speed and departure/arrival for large vessels, regular traffic information dissemination	25%	0%	-0.33	
									121	Pilotage	Compulsory Pilotage to provide expert knowledge and ship handling skills and PEC system	30%	15%	-0.52	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
22	Collision	Two commercial vessels collide	Both vessels have significant hull damage and start to take on water. Fuel leaks from fuel tanks on both vessels. Several crew members on both vessels, plus passengers have serious injuries. One vessel grounds and one vessel sinks within the main fairway. Rescue operation coordinated by Coastguards including a request for tug assistance. All traffic movement in the area suspended. Media interest leading to adverse publicity.	50	2	4	3	4	Both vessels incur damage to shell plating but watertight integrity is not compromised. Multiple minor injuries, or single major injury to crew and passengers. For ferry scenario, vehicles on the car deck break free during the collision and damage other vehicles. Multiple minor injuries, or single major injury crews and to passengers on the ferry. Possible minor pollution. No effect on marine traffic movements. Media interest leading to adverse publicity.	5	2	2	2	2	Vhi	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																12	Ship arriving before POB time/launch arrives late
																16	Unplanned interaction with recreational craft
																23	Communication failure - operational/procedural
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																33	High traffic density
																36	Failure of Aid to Navigation (out of position/unlit)
																39	Vessel obstructing fairway
																56	COLREGS failure to comply
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																82	AIS failure
																90	Excessive vessel speed
																91	Bridge ergonomics (poor bridge layout)
																92	Unsuitable ship design
																96	Lack of awareness
																99	Lack of enforceable speed restrictions

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	6.57	6.27	Hig	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	5.56	Neg
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	10%	0%	50%	6.68			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	5.15	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	6.91			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.78	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	7.14			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	4.61	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	15%	15%	10%	7.68			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions to jet skis obtained in the HRO	10%	0%	4.51	
45	International COLREGS 1972 (as amended)		20%	0%	60%	7.96			33	Exclusion zone	Moving exclusion zone around vessels entering/leaving Oban Bay through North Channel	25%	0%	4.28	
61	Oil spill contingency plans	Limited to current harbour boundaries	0%	10%	10%	8.23			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	4.25	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	0%	75%	8.48			52	Local Port Service - Harbour Control Office	Harbour control office appropriately equipped and manned to meet the scale of harbour activity.	15%	15%	3.56	
87	Standards of Training, Certification and Watchkeeping for Seafarers (STCW)		15%	0%	80%	8.77			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.28	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	9.18			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.89	
95	Training of pollution response personnel		0%	15%	75%	9.18			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.79	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	15%	5%	50%	9.51			121	Pilotage	Compulsory Pilotage to provide expert knowledge and ship handling skills and PEC system	30%	15%	1.70	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	9.51			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.87	
									128	Restricted visibility routine	Limit on speed and departure/arrival for large vessels, regular traffic information dissemination	25%	0%	0.61	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
23	Contact with floating object	Fast craft in contact with buoy	A high speed vessel (recreational or professional) collides with a buoy whilst travelling at speed. There are major injuries from the impact and a fatality. The casualties require air lifting to hospital. Minor damage to the buoy and minor damage to the vessel, but the vessel stays afloat. There is no pollution. Negative national publicity and media interest results from the impact.	25	3	2	0	4	High speed vessel strikes buoy after taking avoiding action to limit speed and direction of impact. Minor damage to the buoy and vessel but no injuries nor pollution. There is minor local adverse publicity.	5	0	1	0	1	Mod	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																23	Communication failure - operational/procedural
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																36	Failure of Aid to Navigation (out of position/unlit)
																38	Light pollution (backscatter)
																43	Malicious action by external parties
																48	Risk Assessment, Incomplete / not reviewed
																55	Incapacitated master (drinks/drugs)
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																88	Special Directions failure to follow / No power to give Special Directions
																90	Excessive vessel speed
																91	Bridge ergonomics (poor bridge layout)
																95	Inappropriate manning of vessels
																96	Lack of awareness
																99	Lack of enforceable speed restrictions
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
4	Aids to navigation, Provision & maintenance of	AtoNs maintained by NLB	15%	0%	80%	4.82	4.76	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.33	Low
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	10%	10%	75%	4.98			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.95	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.12			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.80	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.26			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.86	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	15%	0%	10%	5.33			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	2.84	
45	International COLREGS 1972 (as amended)		15%	0%	50%	5.42			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	5%	2.62	
63	Passage planning	Expectation that all vessels will use a passage plan	15%	0%	50%	5.51			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	2.47	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	25%	0%	50%	5.69			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	1.47	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.07			126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	1.31	
117	Operator/Facility Controls	Including safety management system and trained personnel when vessel is commercial	20%	10%	50%	6.41									
102	Vessel safety management system (ISM code)	For commercial vessels	5%	5%	30%	6.55									
130	HSPV Voluntary Code of Practice	Passenger Safety on Small Commercial High Speed Craft and Experience Rides. Voluntary Code of Practice.	10%	0%	50%	6.67									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
24	Contact with structure	Large vessel (ferry, cruise, cargo, large fishing) vessel contact with North Pier/NLB Pier	Large vessel (ferry, cruise, cargo, large fishing) makes contact with North Pier/NLB berth. Moderate damage to the vessels alongside and the ferry resulting in a cost of £100,000. Structural damage to the pier. Negative national publicity and the attention on social media. Minor injuries to crew. Pollution from ruptured fuel tanks or cargo requiring Tier 2 response.	50	1	2	3	3	Large vessel (ferry, cruise, cargo, large fishing) comes alongside heavily causing minor damage to the fendering but no pollution or injury. There is no impact on port operations or media interest.	10	0	2	0	0	Mod	1	Human error/fatigue - Ship Personnel
																5	Human error/fatigue - Port/Marine Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																18	Inaccurate vessel details provided
																23	Communication failure - operational/procedural
																24	Communication failure - equipment
																26	Adverse weather conditions
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																37	Failure to comply with Standard Operating Procedures
																43	Malicious action by external parties
																57	Vessel Ramps or Hatches not secure
																59	Inadequate procedures shoreside
																72	Failure to follow passage plan
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																86	Competence
																87	Notice to Mariners failure to observe
																88	Special Directions failure to follow / No power to give Special Directions
																90	Excessive vessel speed
																95	Inappropriate manning of vessels

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	4.61	4.31	Mod	79	Requirement for notification of vessel defects	To be written into the HRO	15%	0%	4.08	Low
11	CCTV Coverage	CCTV coverage of Oban Bay, not monitored	10%	0%	50%	4.76			113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	3.94	
14	Communications - traffic broadcast	Voluntary broadcasts on VHF 12 & 16				4.76			121	Pilotage	Compulsory Pilotage to provide expert knowledge and ship handling skills	30%	15%	3.08	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.09			122	Emergency Towage	Assist in recovery of vessel	0%	15%	2.66	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.44									
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	15%	0%	10%	5.70									
57	Marine Safety Management System	Covers current statutory harbour area	10%	0%	50%	5.90									
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	6.08									
63	Passage planning	Expectation that all vessels will use a passage plan	15%	0%	50%	6.41									
74	Protective Fendering	On North Pier and NLB berth	0%	20%	80%	6.77									
87	Standards of Training, Certification and Watchkeeping for Seafarers (STCW)	Vessel crew trained	15%	0%	80%	7.15									
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	80%	7.29									
95	Training of pollution response personnel		0%	20%	80%	7.33									
96	Training of port marine/operations personnel	Limited to current harbour boundaries	15%	0%	50%	7.60									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	15%	80%	7.64									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
25	Fire/Explosion	Fire on commercial vessel alongside	Fire on commercial vessel (or vehicle on ferry) leading to fire/explosion, loss of life, serious pollution, total loss of vessel possible. If vessel alongside then significant damage to berth. Media interest leading to adverse publicity.	50	4	4	3	4	Ferry fire/explosion, contained by ships crews, possible injury, no pollution, minor damage to vessel. No effect on port.	10	1	2	0	0	Sig	1	Human error/fatigue - Ship Personnel
																8	Fire/Explosion
																9	Loss of watertight integrity
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																19	Vessel fails to notify hazardous cargo
																25	Communication failure - Personnel
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																43	Malicious action by external parties
																48	Risk Assessment, Incomplete / not reviewed
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																92	Unsuitable ship design
																96	Lack of awareness

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	5.67	5.53	Sig	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	4.87	Low
11	CCTV Coverage	Of Oban Bay, excluding the Sound of Kerrera. Not monitored	0%	10%	10%	5.81			24	Direction (Special) - Powers of Harbour/Pier Master	Directions issued to marine traffic in Oban Bay and approaches.	0%	15%	4.31	
14	Communications - traffic broadcast	Voluntary vessel announcements on VHF 12 &16	15%	0%	50%	6.06			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	3.16	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	6.22			52	Local Port Service - Harbour Control Office	Direct and coordinate emergency response	0%	20%	2.43	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	6.36			79	Requirement for notification of vessel defects	To be written into the HRO	15%	0%	2.20	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	6.74									
30	Emergency services equipment - shore side	Emergency services shoreside including fire department	0%	30%	75%	7.20									
57	Marine Safety Management System	Limited to current harbour boundaries	10%	10%	10%	7.54									
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	7.56									
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	25%	100%	7.61									
95	Training of pollution response personnel		0%	15%	75%	7.65									
100	Vessel maintenance	Commercial vessels should undergo regular maintenance	20%	0%	75%	8.03									
107	Civil Contingency Plan		0%	10%	75%	8.06									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
26	Fire/Explosion	Fire on recreational/fishing vessel	Fire in the night, people sleeping and overcome by fumes leading to death or serious injury from smoke inhalation, vessel sinks at berth, minor pollution from bunkers. Berth out of action. Media interest leading to adverse publicity.	50	4	2	2	3	Fire on-board a small craft contained by the crew, minor injury, minor damage and no pollution or effect on the port.	25	1	1	0	1	Mod	1	Human error/fatigue - Ship Personnel
																8	Fire/Explosion
																9	Loss of watertight integrity
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																25	Communication failure - Personnel
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																43	Malicious action by external parties
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																92	Unsuitable ship design
																96	Lack of awareness
																103	Derelict/Abandoned vessel

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	4.50	4.34	Mod	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	3.75	Neg
11	CCTV Coverage	Of Oban Bay, excluding the Sound of Kerrera. Not monitored	0%	10%	10%	4.67			24	Direction (Special) - Powers of Harbour/Pier Master	Directions issued to marine traffic in Oban Bay and approaches.	0%	15%	3.24	
14	Communications - traffic broadcast	Voluntary vessel announcements on VHF 12 &16	15%	0%	50%	4.95			28	Education (harbour community information)	Coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	10%	0%	3.04	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.13			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	1.90	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.30			52	Local Port Service - Harbour Control Office	Direct and coordinate emergency response	0%	20%	1.34	
24	Direction (Special) - Powers of Harbour/Pier Master	Limited to current harbour boundaries	20%	0%	10%	5.73			79	Requirement for notification of vessel defects	To be written into the HRO	15%	0%	1.12	
30	Emergency services equipment - shore side	Emergency services shoreside including fire department	0%	30%	75%	6.28			116	Evacuation Plan	Of North Pier Pontoons and Kerrera Marina	0%	10%	0.91	
57	Marine Safety Management System	Limited to current harbour boundaries	10%	10%	10%	6.72			126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.94	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	6.86									
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	25%	100%	7.24									
95	Training of pollution response personnel		0%	15%	75%	7.52									
107	Civil Contingency Plan		0%	10%	75%	7.74									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
27	Flooding/Foundering	Vessel sinks within harbour	A large vessel (ferry, cruise, cargo, large fishing) vessel takes on water and sinks at its berth. There is Tier 2 pollution from the fuel on board and bilge tanks. There is minimal disruption to the harbour as the channel remains clear and the vessel can be salvaged at its berth in due time.	50	3	2	2	1	Small recreational vessel sinks within the harbour, perhaps on its mooring. There is no one on board so no loss to life. Tier 1 pollution is caused from the fuel and bilge tanks. No impact or disruption to the port	5	0	2	2	0	Hig	1	Human error/fatigue - Ship Personnel
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																26	Adverse weather conditions
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																92	Unsuitable ship design
																103	Derelict/Abandoned vessel
																104	Vessel structural failures

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	10%	10%	50%	5.00	4.64	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.28	Low
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.33			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.96	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.70			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.93	
61	Oil spill contingency plans	Limited to current harbour boundaries	0%	10%	10%	5.92			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.67	
102	Vessel safety management system (ISM code)	Commercial vessels have requirements to stand by anchor	10%	10%	75%	6.22			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	1.88	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	25%	75%	6.85									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
28	Grounding	Large vessel (ferry, cruise, cargo, large fishing) grounds	Vessel makes contact with seabed and is holed below the waterline and takes on water. Fuel leaks from forward tanks. Weather is deteriorating and vessel is driven further ashore. Crew and passengers have serious injuries. Rescue operation coordinated by HM Coastguards including a request for tug assistance. All traffic movement through at the incident location suspended by a Temporary Exclusion Zone. Adverse publicity.	50	4	4	3	4	Large vessel (ferry, cruise, cargo, large fishing) briefly grounds and refloats. The vessel continues to berth. Minor delays to the ferry service whilst vessel is checked for damage. Negligible property damage, no injuries, no pollution, minor disruption to port operations.	25	0	1	0	1	Mod	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																9	Loss of watertight integrity
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																23	Communication failure - operational/procedural
																24	Communication failure - equipment
																26	Adverse weather conditions
																28	Restricted visibility
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																37	Failure to comply with Standard Operating Procedures
																48	Risk Assessment, Incomplete / not reviewed
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																55	Incapacitated master (drinks/drugs)
																61	Incorrect assessment of tidal flow
																72	Failure to follow passage plan
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																92	Unsuitable ship design
																95	Inappropriate manning of vessels
																96	Lack of awareness

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
4	Aids to navigation, Provision & maintenance of	AtoNs maintained by NLB	25%	0%	80%	4.72	4.53	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.13	Neg
7	Availability of latest hydrographic information	CMAL survey Oban Bay, Sound of Kerrera and the Northern Approaches	10%	0%	75%	4.81			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.77	
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	4.92			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.50	
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	5%	15%	50%	5.14			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	3.43	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.25			43	Hydrographic surveying program	Surveying of Sound of Kerrera, Oban and its approaches to be encompassed into the plan	10%	0%	3.29	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.36			52	Local Port Service - Harbour Control Office	Direct and coordinate emergency response	0%	20%	2.62	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	5.47			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.35	
63	Passage planning	Expectation that all vessels will use a passage plan	20%	0%	75%	5.69			122	Emergency Towage	To assist in refloat and recovery of vessel	0%	15%	1.86	
87	Standards of Training, Certification and Watchkeeping for Seafarers (STCW)		15%	10%	75%	6.01			123	Workboat/Tug	To assist in refloat and recovery of vessel	0%	10%	1.62	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	15%	100%	6.19			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.68	
95	Training of pollution response personnel		0%	15%	75%	6.37									
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	5%	0%	50%	6.45									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	75%	6.86									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
29	Grounding	Recreational craft (yacht/RIB/Powerboat/paddle craft) or fishing craft grounds	Recreational/fishing vessel grounds and then capsizes causing serious injuries or one fatality. Vessel sinks and fuel leaks from recreational craft's bunkers causing a Tier 2 pollution event. Serious adverse publicity.	50	3	3	3	3	Yacht briefly grounds and then refloats. There is no damage, injuries or pollution. There is no effect on the port or damage to reputation.	1	0	1	0	1	Sig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																9	Loss of watertight integrity
																11	Vessel breakdown or malfunction
																14	Vessel has unreported defect
																26	Adverse weather conditions
																27	Unexpected shoaling
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																33	High traffic density
																39	Vessel obstructing fairway
																48	Risk Assessment, Incomplete / not reviewed
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																55	Incapacitated master (drinks/drugs)
																61	Incorrect assessment of tidal flow
																72	Failure to follow passage plan
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																86	Competence
																92	Unsuitable ship design
																96	Lack of awareness
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
4	Aids to navigation, Provision & maintenance of	AtoNs maintained by NLB	15%	0%	80%	4.76	4.63	Mod	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.21	Neg
7	Availability of latest hydrographic information	CMAL survey Oban Bay, Sound of Kerrera and the Northern Approaches	10%	0%	75%	4.87			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.84	
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	5.17			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.63	
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	0%	15%	50%	5.66			28	Education (harbour community information)	Information provided on likely grounding areas and what to do	10%	0%	3.51	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.91			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.27	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	6.02			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	1.33	
28	Education (harbour community information)	Signage and leaflets available in harbour office	5%	0%	75%	6.07			40	Harbour website	Take over running of Oban Harbour website and Facebook page. Keep information up to date and relevant	5%	0%	1.29	
40	Harbour website	Guides and information for small craft	10%	0%	75%	6.20			43	Hydrographic surveying program	Surveying of Sound of Kerrera, Oban and its approaches to be encompassed into the plan	10%	0%	1.22	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	6.31			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	0.97	
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	75%	6.56			86	Shore side signage	To advise of areas which are likely for a grounding to occur	10%	0%	0.91	
95	Training of pollution response personnel		0%	10%	75%	6.67			120	Zoning	Zoning of the area and small vessel channels	20%	0%	0.80	
105	Voluntary code for safe navigation	Detailing speed limits and small vessel channels	5%	0%	50%	6.74			122	Emergency Towage	Assist in recovery of vessel	0%	15%	0.46	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	75%	7.11			123	Workboat/Tug	Assist in recovery of vessel	0%	15%	0.17	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	0.13	
									126	Permit/Licensing scheme	Requirements placed on training and insurance	15%	0%	0.09	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
30	Marine Pollution	Marine pollution from bunkering spill, marine incident or deliberate act	A pollution event from a marine incident, bunkering or deliberate act results in oil or fuel making contact with moored vessels, particularly vessels with GRP hulls. Fuel comes ashore on Oban foreshore with serious environmental effects. Tier 2 oil spill response initiated. Possible suspension of ship operations in Oban Bay during the oil recovery phase. A significant number of compensation claims are filed against the vessel/berth owner responsible for the spill. Media interest leading to adverse publicity.	25	0	3	3	4	Fuel spill or minor deliberate contamination contained by a Tier 1 response. Remaining oil spreads in a light sheen across Oban Bay. Vessel traffic movement in the incident area effected. Media interest.	5	0	2	3	2	Hig	1	Human error/fatigue - Ship Personnel
																5	Human error/fatigue - Port/Marine Personnel
																7	Inadequate procedures in place onboard vessel
																14	Vessel has unreported defect
																23	Communication failure - operational/procedural
																24	Communication failure - equipment
																25	Communication failure - Personnel
																37	Failure to comply with Standard Operating Procedures
																48	Risk Assessment, Incomplete / not reviewed
																59	Inadequate procedures shoreside
																69	Port Equipment (inc. craft) mechanical breakdown/control system malfunction
																75	Inadequate maintenance / inspection
																80	Human error

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	10%	75%	6.69	6.45	Hig	8	Availability of pollution response equipment	Boom around bunkering trucks whilst on the pier	0%	30%	5.15	Mod
9	Bunkering areas, restricted	Bunkering areas in Oban SHA restricted to North Pier, NLB berths and CMAL/CalMac Railway Pier	5%	0%	10%	6.74			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.82	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	7.00			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.51	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	7.28			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.23	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	5%	10%	7.31			71	Pre-bunkering checklist	Distributed to all other bunkering areas in proposed SHA	15%	0%	4.08	
71	Pre-bunkering checklist	In place for North Pier	15%	0%	50%	7.46									
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	7.57									
95	Training of pollution response personnel		0%	25%	75%	7.69									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
31	Marine Pollution	Marine pollution from environment run off	Pollution caused by environment run off and spread by rain into Oban Harbour is further spread by wind and the current over Oban Bay. It spreads to the foreshore resulting in a Tier 1 oil spill. There is a large impact on local businesses operating in the vicinity. They may have to potentially postpone tours during clean up operations. Media interest leading to adverse publicity. There are no injuries.	10	0	1	2	2	Pollution contained by a small Tier 1 response or quickly dissipates into wider environment. Local business operating in the incident area effected for a short period. Minor reputational damage.	1	0	1	2	1	Hig	26	Adverse weather conditions
																62	Illegal discharges into the water
																100	Inland pollution run off

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	5.68	5.31	Sig	61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.95	Mod
61	Oil spill contingency plans	Limited to current harbour boundaries	0%	10%	10%	5.96									
95	Training of pollution response personnel		0%	15%	75%	6.42									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
32	Mooring Failure	Mooring failure	Vessel breaks free from mooring during adverse weather conditions (south westerly or northerly winds) and either grounds or is in collision with another vessel (see relevant Grounding/Collision assessment) Media interest leading to adverse publicity.	25	0	3	3	3	Vessel breaks free and is recovered by another vessel (for example, Lifeboat) and is safely returned to its moorings. No injuries. No pollution. Possible media attention.	10	0	0	0	1	Mod	26	Adverse weather conditions
																40	Failure of berth mooring systems
																75	Inadequate maintenance / inspection
																76	Inadequate training / competence - Others
																80	Human error
																101	Factors causing excess strain on moorings
																102	Corrosion of mooring chains leading to failure

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
11	CCTV Coverage	Of Oban Bay, excluding the Sound of Kerrera, not monitored	0%	5%	70%	4.22	4.09	Mod	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	20%	0%	3.81	Low
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	4.50			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.49	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	4.80			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.20	
39	Harbour patrol	Dory can assist with vessel recovery	0%	15%	75%	5.04			39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	2.33	
61	Oil spill contingency plans	Limited to current harbour boundaries	0%	10%	75%	5.13			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.08	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	25%	75%	5.38			123	Workboat/Tug	Assist in recovery of vessel	0%	15%	1.74	
109	Suitable equipment used	Suitable mooring equipment used for size of vessel	30%	10%	50%	5.89									
110	Mooring buoy maintenance	Carried out by Kerrera Marina, Oban Yacht Club and the Visitor Moorings	30%	0%	50%	6.44									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
33	Other	Wash affecting moored vessels	Commercial vessels travelling over 6 knots producing excess wash causes minor injuries to persons on live aboard vessels in Kerrera Marina. There is also minor damage to the vessels and mooring equipment. There is negative local publicity and damage to reputation. No pollution.	10	1	1	0	2	Significant wash in moored areas (particularly Kerrera) leads to complaints by marina users. There is potential for minor injuries to people from trips and falls. No damage to property nor the environment.	1	1	0	0	1	Sig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																26	Adverse weather conditions
																80	Human error
																90	Excessive vessel speed
																96	Lack of awareness
																99	Lack of enforceable speed restrictions
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
105	Voluntary code for safe navigation	Includes voluntary speed limit	25%	0%	50%	4.37	4.25	Mod	113	Powers obtained through HRO	Ability to set an enforceable speed limit for all craft	10%	0%	4.14	Low
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	4.56			112	Enforcement of speed limit	Speed limit enforced to all craft	20%	0%	3.93	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	4.77			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.57	
30	Emergency services equipment - shore side	Including medical assistance	0%	10%	50%	5.01			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.24	
									124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	2.41	
									39	Harbour patrol	Seasonal and directing traffic, enforcing speed limits and other regulations	30%	20%	1.75	
									121	Pilotage	Compulsory Pilotage to provide expert knowledge and ship handling skills and PEC system	30%	15%	1.17	
									86	Shore side signage	Signage warning vessels of speed limits			1.17	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
34	Other	Inflatable craft blown offshore	An inflatable craft with at least one person is blown offshore. The person falls in to the water and is affected by hypothermia leading to a fatality. There is no pollution and a negligible property cost, negative local publicity and moderate damage to reputation.	5	3	0	0	2	A person in an inflatable craft is blown offshore. They are rescued either by the RNLI or another water user. The person suffers minor injuries including hypothermia. There is no property cost, no damage to the environment and no effect on the port's reputation.	1	1	0	0	0	Sig	26	Adverse weather conditions
																49	Loss of vessels stability (due to other than loss of watertight integrity)
																55	Incapacitated master (drinks/drugs)
																76	Inadequate training / competence - Others
																80	Human error
																96	Lack of awareness

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	35%	80%	5.08	4.32	Mod	13	Communications - Stakeholder	Increased signage and education of water users	10%	0%	4.28	Low
11	CCTV Coverage	Of Oban Bay, excluding the Sound of Kerrera, not monitored	0%	5%	70%	5.13			11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	3.80	
13	Communications - Stakeholder	Some signage and leaflets distributed from harbour office	5%	0%	50%	5.15			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.52	
14	Communications - traffic broadcast	Voluntary vessel broadcasts on VHF 12 & 16	10%	0%	50%	5.20			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.28	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.31			39	Harbour patrol	Act pre-emptively to advise inflatable before there is an incident & recover any person in distress	15%	15%	2.85	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.44									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
35	Other	Large Cruise vessel at anchor in Oban Bay drags its anchor	Vessel drags anchor in adverse weather conditions towards the quays, piers and jetties. Vessel slow speed impact with quay, damaging quay and port infrastructure. Crew and passengers possible injuries during emergency disembarkation. No pollution. Media interest leading to adverse publicity.	25	1	3	0	3	Vessel drags anchor in adverse weather conditions towards the quay, piers and jetties and obstructs the approach for ferries and commercial vessels. Potential for fouled anchor with mooring buoys. Possible delays to port operations during the period the vessel recovers anchor and re-anchors. No injuries. No pollution. Possible media interest.	10	0	1	0	1	Mod	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																11	Vessel breakdown or malfunction
																23	Communication failure - operational/procedural
																26	Adverse weather conditions
																32	No enforceable Byelaws/Harbour Direction/Local Regulation
																48	Risk Assessment, Incomplete / not reviewed
																61	Incorrect assessment of tidal flow
																76	Inadequate training / competence - Others
																95	Inappropriate manning of vessels

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
11	CCTV Coverage	Of Oban Bay, excluding the Sound of Kerrera, not monitored	0%	20%	10%	4.64	4.13	Mod	53	LPS broadcast (navigation and safety information)	Harbour control office appropriately equipped and manned to meet the scale of harbour activity	15%	0%	3.90	Low
14	Communications - traffic broadcast	Voluntary vessel made broadcasts on VHF 12 & 16	10%	15%	50%	5.17			11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	3.39	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.29			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.20	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.42			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions to jet skis obtained in the HRO	10%	0%	3.09	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	5.82			124	VTM - Seasonal Service	Seasonal VTM, controlling and deconflicting traffic movements, enforcing speed limits and other regulations	30%	20%	2.21	

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
36	Other	Helicopter blade strike with vessel superstructure on take-off/landing	Blade strike with ship superstructure, helicopter crashes into Oban Bay, fatalities to helicopter crew and passengers. Small scale pollution from aviation fuel from the helicopter. Port operations in Oban Bay are suspended. Media interest leading to adverse publicity.	50	4	3	4	4	Blade contact with ship superstructure. Pilot makes a controlled emergency landing. Slight injuries to a number of crew and passengers from unexpected vessel movement. No pollution. Media attention.	25	1	1	0	2	Sig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																7	Inadequate procedures in place onboard vessel
																24	Communication failure - equipment
																25	Communication failure - Personnel
																26	Adverse weather conditions
																28	Restricted visibility
																33	High traffic density
																43	Malicious action by external parties
																55	Incapacitated master (drinks/drugs)
																72	Failure to follow passage plan
																76	Inadequate training / competence - Others
																80	Human error
																94	Lack of visibility of craft/persons
																96	Lack of awareness
																107	Inadequate procedures on helicopter

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	20%	75%	5.64	5.34	Sig	16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.89	Low
14	Communications - traffic broadcast	Voluntary announcements prior to entering and leaving on VHF 16 & 12	15%	0%	40%	5.92			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.48	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	6.10			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	4.20	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	6.26			25	Directions (General) - issued by Harbour Authority	Ability to issue general directions to jet skis obtained in the HRO	10%	0%	4.04	
45	International COLREGS 1972 (as amended)		10%	0%	75%	6.47			52	Local Port Service - Harbour Control Office	Harbour control office appropriately equipped and manned to meet the scale of harbour activity.	15%	15%	3.28	
61	Oil spill contingency plans	Covers North Pier and Railway Pier SHAs only	0%	10%	10%	6.64			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	2.94	
63	Passage planning	Carried out by vessel and sea plane	20%	0%	75%	7.12									
90	Tier 2 contractor	A&BC and CMAL/CalMac	0%	20%	100%	7.50									
95	Training of pollution response personnel		0%	10%	75%	7.62									
105	Voluntary code for safe navigation	Includes ensuring area is clear of craft before take off/landing	10%	0%	50%	7.90									
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	8.02									

Assessment Number	Hazard Category	Hazard Scenario Title	Worst Credible Scenario	Years between worst occurrence	Consequence				Most Likely Scenario	Years between likely occurrence	Consequence				Inherent Risk	Cause ID	Causes
					People	Property	Planet	Port			People	Property	Planet	Port			
37	Other	Small vessel gets entangled in creel pot's lines	Small vessel picks-up one of the pot ropes in its propeller. Vessel's engine overheats and stops. Vessel drifts with no power and either grounds or is in collision with another vessel (see Grounding/Collision assessment) Media interest leading to adverse publicity.	25	4	2	3	3	Small vessel picks up one of the pot ropes in its propeller. Engine is stopped and crew manage to free the line. Small vessel continues on passage. No injuries. No pollution. Possible media interest.	5	0	1	0	1	Sig	1	Human error/fatigue - Ship Personnel
																6	Inadequate bridge resource management
																23	Communication failure - operational/procedural
																26	Adverse weather conditions
																28	Restricted visibility
																36	Failure of Aid to Navigation (out of position/unlit)
																39	Vessel obstructing fairway
																76	Inadequate training / competence - Others
																90	Excessive vessel speed
																96	Lack of awareness
																97	Floating objects e.g. creel markers
																106	Deliberate action taken by external parties

Control ID	Embedded Controls					Aggregate Risk	Current Risk	Current Risk	Control ID	Further Applicable Controls				Residual Risk	Final Risk
	Control	Comment	Frequency Reduction	Consequence Reduction	Completeness					Control	Comment	Frequency Reduction	Consequence Reduction		
8	Availability of pollution response equipment	Tier 1 Oil Spill Response Equipment held by A&BC, NLB and CMAL/CalMac	0%	15%	75%	5.39	5.17	Sig	11	CCTV Coverage	Expanded to Sound of Kerrera, CCTV monitored	0%	15%	4.48	Low
11	CCTV Coverage	Of Oban Bay, excluding the Sound of Kerrera. Not monitored	0%	10%	10%	5.56			16	Contingency plan exercises	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	4.09	
14	Communications - traffic broadcast	Voluntary broadcasts on VHF 12 & 16	5%	5%	50%	5.71			19	Council Emergency Plan (Local)	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.75	
16	Contingency plan exercises	Limited to current harbour boundaries	0%	10%	10%	5.84			24	Direction (Special) - Powers of Harbour/Pier Master	HM to obtain powers of special directions, with ability to delegate powers for the whole harbour area	15%	0%	3.58	
19	Council Emergency Plan (Local)	Covers Oban Bay	0%	10%	75%	5.98			28	Education (harbour community information)	Coordinated by Harbour Authority and emergency services, local fishing companies, fishing associations, individual owners, recreational clubs, commercial providers.	10%	0%	3.49	
61	Oil spill contingency plans	Limited to current harbour boundaries	0%	10%	10%	6.13			53	LPS broadcast (navigation and safety information)	Harbour control office appropriately equipped and manned to meet the scale of harbour activity	15%	0%	3.37	
95	Training of pollution response personnel		0%	15%	75%	6.36			61	Oil spill contingency plans	To be expanded to the whole of the proposed Oban Bay and Approaches harbour limits	0%	10%	3.04	
106	RNLI	Local RNLI station in Oban assist in incidents when directed by coastguard	0%	30%	80%	6.71									

D Stakeholder Correspondence

The following table documents the comments provided by consultees. The first column identifies the consultee group or organisation, the second column identifies the comments made. Each comment has been given a unique identifying code and number.

Consultee	Comments
OCHDA Response 1	On behalf of OCHDA and myself, thank you for the draft NRA materials. I think it's fair to say that I and my OCHDA and sea kayak provider colleagues are generally happy with the draft, but we do have a few comments and proposed amendments. If it's OK with you, I would rather submit them in a table, referenced to the Hazard Log and NRA spreadsheet rather than annotating the existing documents. Partly this is to save time but also it will give me space to briefly explain the reasons for the proposed amendments. Is that acceptable to you? From and OCHDA point of view and for my own interest, I'd quite like to understand the process from here on. Perhaps we could arrange to talk on the phone at a mutually convenient time? I don't think that it would take long. ABPmer response Thank you very much for your response and your consideration for the NRA. We are glad that you are generally happy with the documents. Please submit any proposed amendments how you see fit once this consultation period we will include them within our final version. Note: Phone call followed which included explanation of the process of the NRA and scope of the Study. Additional some questions around the statutory areas and codes currently in place within the wider area.

Consultee	Comments
OCHDA Response 2	Thank you for the NRA files. Several OCHDA Board Members have studied and commented on the documents. I have summarised their feedback below. **Overview:** The OCHDA Board fully supports the NRA activity and board members are relieved that it is underway. However, they are concerned at the low level of implementation identified against even the “current" control measures. OCHDA feels strongly that the range and complexity of the risks identified highlight the critical and pressing need for the HRO and rapid implementation of effective unified control of the wider harbour under the new SHA. **Specific risks:** A. Excessive speed wake: A number of members reported that they have personally experienced or witnessed incidents where the wake of craft exceeding the code of practice speed limits have caused problems for moored vessels. The consensus is that frequency of occurrence is in the order of twice per year. The impact of these incidents has ranged from simple discomfort, a person has falling into the water from the Kerrera Pontoon and minor injuries to people on board small vessels. There is clearly a potential for serious injury and/or fire. The “Most likely” scenario might be a crew member falling and sustaining minor impact injuries and a “worst credible” scenario could well be the spilling of flammable liquid and fire on board a moored vessel. The only current control is the voluntary code. The required controls would include a mandatory limit, with suitable signage and effectively enforced by the SHA. B. Collision in the North Channel between commercial and leisure craft. Several knowledgeable members voiced the opinion that in the event of a car ferry or similar vessel striking a GRP hulled vessel in the north channel, it is unlikely that the leisure vessel would maintain watertight integrity. It is unlikely that the commercial vessel would be able to avoid a leisure vessel in the restricted channel and also unlikely that the commercial vessel would be able to significantly reduce speed before the impact. Risk of a fatality or multiple fatalities is surely credible.

Consultee	Comments
	C. Potential helicopter incident. Although the probability of an incident is considered to be low. It is felt that the implications of, for example, a rotor strike, would be much more serious that implied in the NRA. I have studied the FAA guidance on helicopter incidents and find that loss of power and loss of tail rotor effectiveness are well understood and pilots practice for that eventuality. There is at least a good possibility of a controlled emergency landing. However, rotor strike is extremely unpredictable in its effect and for obvious reasons, pilots don't generally practice that eventuality. Therefore, it seems highly likely that such an incident could credibly result in serious injury or death for people on the helicopter and also injury, death and fire at the impact site. This risk number should therefore reflect a maximum effect score. D. Pollution events. The consensus is that pollution events in the harbour have been happening at a rate of roughly twice per year. These events have been more often from sources on land than from vessels. Whilst it is appreciated that the prevention of pollution events whose source is on land is not the responsibility of the SHA, dealing with the effect surely is? I hope that you will be able to adjust the NRA to reflect the feedback above and hence contribute to the effectiveness of the activity. ABPmer response I can confirm your responses have been received and I have saved them into our project log for comment and inclusion in the NRA.

Consultee	Comments
OSC Member and OBCB Moorings Officer.	I had a look through the documents and would comment as follows on two sections of the draft NRA: Section S19 Item 115 re sailing events. Not all Sailing events which use Oban Bay are run by Oban Sailing Club. For example, the Scottish Islands Peaks Race in May and West Highland Yachting Week are not run by OSC, but are run by their separate organising committees, as is the Round Kerrera Kayak race which is a similar type of event with up to 50+ entries. Section S32 Item 115 re mooring maintenance. Neither Oban Sailing Club (not Yacht Club) nor Oban Bay Community Berthing Ltd which owns the visitor moorings, carry out maintenance of moorings. It is the responsibility of each owner of the 103 private and 16 visitor moorings to comply with the terms of their Lease Agreements with the Moorings Association, OBCB Ltd, to ensure that the moorings are regularly maintained, at least annually, by a professional moorings contractor and that they are suitable for the size of vessel using the mooring. I would also suggest that Kerrera marine do not carry out maintenance of their moorings but use a specialist moorings contractor, as some of their moorings are too heavy for any boat other than a specialist to maintain. I trust that these comments are useful, but should any further clarification be required please contact me. ABPmer response Thank you very much for your comments. They are very useful, and we will ensure to consider them within the final version of the NRA.

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