ATTACHMENT TWENTY-SEVEN
Sand Extraction Operation Plan (“SEOP”)

McCALLUM BROS LTD

Established 1904

Te Ākau Bream Bay Sand Extraction Project

Sand Extraction Operation Plan (SEOP)

November 2025

Revision history

Title: Te Ākau Bream Bay Sand Extraction Project – Sand Extraction Operation Plan (SEOP)				
Date	**Version**	**Description**	**Prepared by**	**Date certified**
15/07/2025	1	Final draft for consultation	L.Davis N.McCallum	
11/11/2025	2	Included internal procedure for closing cells	L.Davis	

Glossary of Terms

ACERT	Advance Combustion Emission Reduction Technology
ASEA	Approved Sand Extraction Area
EPA	Environmental Protection Authority
IMO	International Maritime Organisation
ISPS Code	International Ship and Port Facility Security Code
MOSS	MNZ Maritime Operator Safety System
MTOP	Marine Transport Operator Plan
MARPOL	International Convention for the Prevention of Pollution from Ships
MBL	McCallum Bros Limited
MMMP	Marine Mammal Management Plan
MNZ	Maritime New Zealand
RAM	Restricted in Ability to Manoeuvre
SEOP	Sand Extraction Operation Plan
TSHD	Trailing Suction Hopper Dredge

Limitations

The report has been prepared to a specific scope of work. The report cannot be relied upon by a third party for any use without written consent of MBL (the disclosing party). This report may not be reproduced or copies in any form without the permission of the disclosing party. **This document must always be displayed onboard the *William Fraser* at all times.**

Table of Contents

List of Figures

List of Tables

1.0 Introduction

McCallum Bros Limited (MBL) has been granted resource consent (*reference* TBC) for sand extraction at the Te Ākau Bream Bay Sand Extraction Site (Figure 1). This consent was given effect to on (*date* TBC) and expires on (*date* TBC).

1.1 Purpose

The purposes of this SEOP is to:

1. Ensure sand extraction activities are carried out safely, efficiently, and in accordance with all relevant regulatory and consent requirements.
2. Minimise environmental effects of extraction, particularly on benthic habitats and marine wildlife, through controlled, well-distributed operations.
3. Provide clear procedures for tracking and reporting extraction volumes and environmental performance
4. Manage vessel lighting to meet maritime safety standards while minimising light-related impacts on seabirds and other sensitive species.
5. Align sand extraction activities with the broader environmental monitoring and management framework, ensuring regular review and continuous improvement throughout the life of the consent.

1.2 Scope

This SEOP applies to all MBL employees and contractors involved in vessel-based sand extraction operations for the Te Ākau Bream Bay Sand Extraction Site.

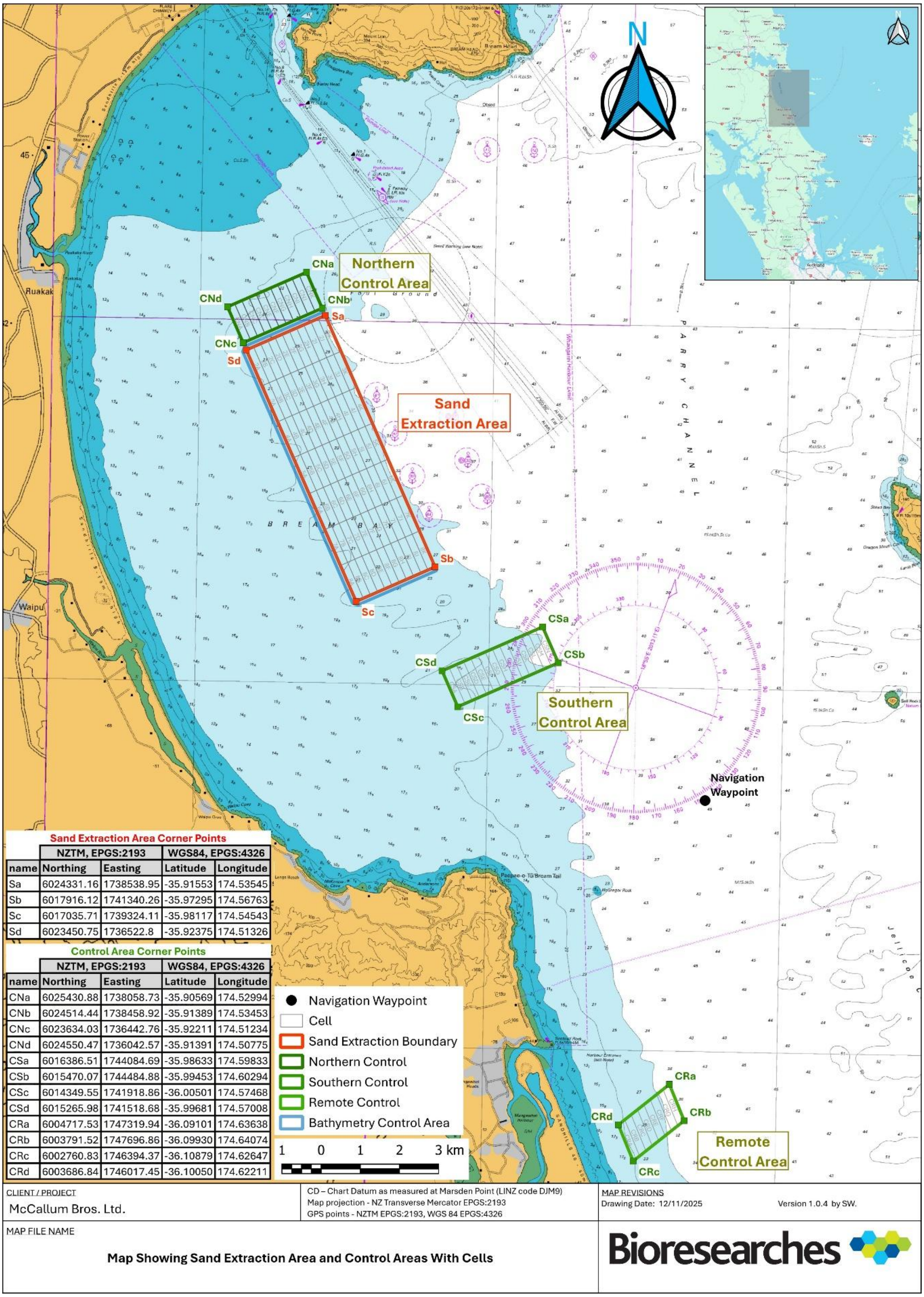
1.3 Objectives

The objective of this Sand Extraction Operation Plan (SEOP) is to avoid or minimise the risk of adverse effects arising from the operation of the *William Fraser* (Figure 2) at the sand extraction site.
This plan outlines procedures for:

1. The management of sand extraction activities, including:
    a. An overview of extraction operations;
    b. Use of extraction cells to guide and control activity;
    c. Monitoring, reporting, and compliance protocols; and,

d. Roles, responsibilities, and training of operational staff

2. Implementation of a Light Management Plan (LMP) to reduce light spill and glare, and minimise potential impacts on marine wildlife and seabirds. The objective of the LMP is to avoid or minimise the potential adverse effects on seabirds, marine mammals and marine reptiles from lighting while operating in the hours of darkness.



Sand Extraction Area Corner Points

	NZTM, EPGS:2193		WGS84, EPGS:4326	
name	Northing	Easting	Latitude	Longitude
Sa	6024331.16	1738538.95	-35.91553	174.53545
Sb	6017916.12	1741340.26	-35.97295	174.56763
Sc	6017035.71	1739324.11	-35.98117	174.54543
Sd	6023450.75	1736522.8	-35.92375	174.51326

Control Area Corner Points

	NZTM, EPGS:2193		WGS84, EPGS:4326	
name	Northing	Easting	Latitude	Longitude
CNa	6025430.88	1738058.73	-35.90569	174.52994
CNb	6024514.44	1738458.92	-35.91389	174.53453
CNc	6023634.03	1736442.76	-35.92211	174.51234
CNd	6024550.47	1736042.57	-35.91391	174.50775
CSa	6016386.51	1744084.69	-35.98633	174.59833
CSb	6015470.07	1744484.88	-35.99453	174.60294
CSc	6014349.55	1741918.86	-36.00501	174.57468
CSd	6015265.98	1741518.68	-35.99681	174.57008
CRa	6004717.53	1747319.94	-36.09101	174.63638
CRb	6003791.52	1747696.86	-36.09930	174.64074
CRc	6002760.83	1746394.37	-36.10879	174.62647
CRd	6003686.84	1746017.45	-36.10050	174.62211

Figure 1: Map Showing Sand Extraction Area and Control Areas With Cells. Source: Bioresearches 2025. Assessment of Ecological Effects – benthic ecology.

2.0 Sand Extraction Operation Methodology

2.1 The Vessel

The vessel used to carry out the sand extraction activities is the trailing suction dredger *William Fraser*. The vessel has a crew of four, with a minimum of two crew on watch during extraction. Further vessel details are shown below in Table 1:

Table 1: Vessel Details.

VESSEL DETAILS			
Vessel name:	William Fraser	**IMO #**	9864605
Vessel type:	Landing Craft	**Vessel length**	68m
Year of build:	2019	**Vessel draught**	4.2m
Hull material:	Steel	**Service category:**	Cargo
Gross Tonnage	1540	**Loading ramp capacity**	150 tonnes
Propulsion power:	**Main make & kilowatts**	**Auxiliary:**	
	2 x Caterpillar C32 - 746 kW each	2 x 80 kVA generators 1 x 800 kVA generator	
Classification society:	Lloyds Registry		

Figure 2: William Fraser extracting sand at Pākiri. Source: MBL.

2.2 Operating Limits

The following operational limits will be adopted by the *William Fraser*:

- The vessel has a surveyed sand carrying capacity of 923m^3;
- During the first 3 years of consent (150,000m^3/year) there will be 3 trips per week on average with a total of approximately 163 trips per year;
- During the remaining 32 years of consent (250,000m^3/year) there will be 5 trips per week on average with a total of approximately 271 trips per year;
- During active sand extraction, the maximum allowable speed will be 2.5 knots; and,
- During transit between the extraction site and the Port of Auckland, the maximum allowable speed will be 9.5 knots.

2.3 Operating Hours

Sand extraction will be limited to the following operational windows:

- 12:00 pm to 6:00 pm during the months of April to September (inclusive).
- 12:00 pm to 8:00 pm during the months of October to March (inclusive).

Sand extraction will be limited to 3.5 hours maximum on any given day to minimise time spent in the embayment.

2.4 Method of Extraction

The following outlines the standard operational procedure for a typical sand extraction voyage by MBL to Te Ākau Bream Bay:

1. The MBL Operations Manager reviews marine forecasts to determine if conditions are safe for extraction. If favourable, the Environmental Manager prepares a Trip Plan for the *William Fraser*.
2. The *William Fraser* departs the Port of Auckland in the morning, travelling through Tiri Passage, past Kawau Island and Mangawhai-Pākiri to Te Ākau Bream Bay. The vessel adheres to a maximum speed of 9.5 knots. See Figure 3 below for the transit route of *William Fraser.*
3. Upon approach to the ASEA, the vessel operational lights are activated, and speed is reduced to 1.5–2.5 knots to commence extraction setup.
4. Pre-extraction checks are undertaken to ensure the draghead and all other operational equipment in the water column are free from loose gear and entanglements.

5. The Master of the *William Fraser* navigates the vessel to the starting coordinate of the predetermined extraction path for that trip, located on the boundary of the ASEA.

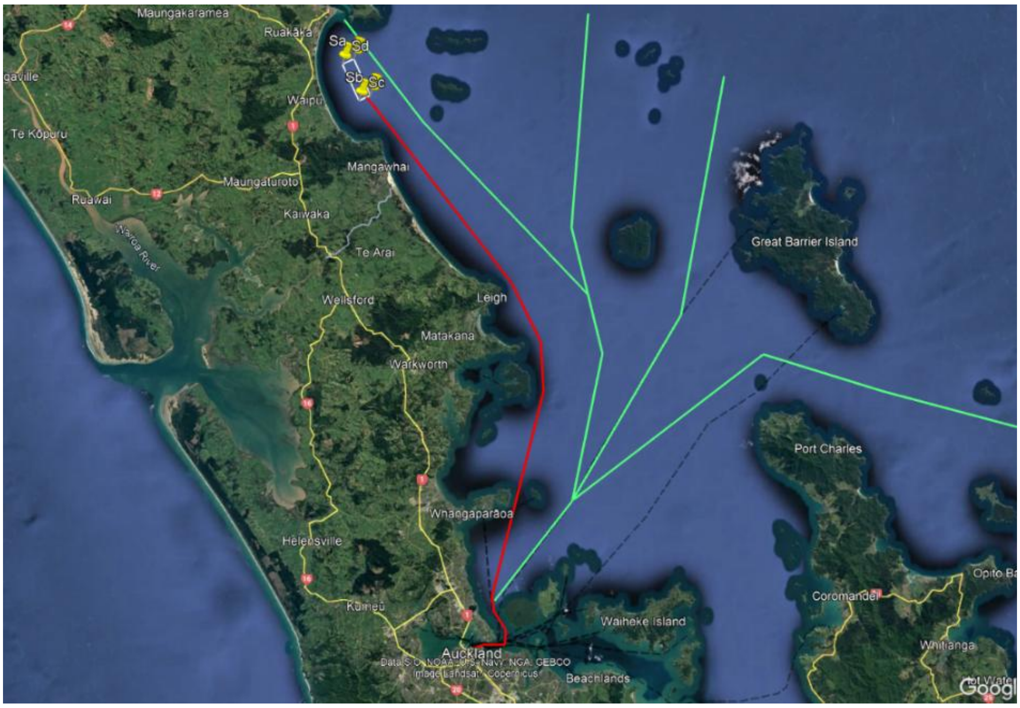


Figure 3: Map showing the accepted transit route of the William Fraser (red) and the recommended route for large commercial vessels (green). This is the trip plan to Te Ākau Bream Bay from the Port of Auckland. Source: Google Earth.

6. The draghead is unsecured from the vessel, the davits extend the pump and dredge pipework over the starboard side, then they are slowly lowered within 3 m of the seafloor where suction/pumping of seawater commences to prime the pumps.
7. The pumps are initially primed with water, after which the draghead is fully lowered to the seafloor to commence extraction. At this point, the vessel's position is geolocated using the MAXSea navigational software to enable the extraction track to be recorded. Simultaneously, a switch on the swell compensator is automatically triggered, initiating an independent recording of the extraction track. Both recording systems continue logging data until extraction ceases and the draghead is lifted from the seafloor.
8. As the draghead moves forward along the seafloor, the top 100 mm of seabed is fluidised and pumped onboard via the draghead and dredge system.
9. This results in a 1.6 m wide x 100 mm deep extraction track being created on the sea floor. The duration of this shallow trench is temporary and dependent upon wave conditions at the time of and following extraction
10. The sand slurry moves up the draghead pipe, through the pump and then onboard the vessel where it is discharged onto a double deck screening tower that utilises a 2.0 mm screen mesh to prevent larger material going into the load of the hopper.

11. Oversized material passes across the top of the screen and drops via a pipe into the forward port side moon pool and exits at keel height under the vessel.

12. The sand passes through the screen deck and into two pipes that run along the sides of the holding hopper and discharge into the storage hopper on board. As the slurry drops into the sand hopper the water velocity slows, and the sand settles out. The water and any finer sediment in the load then pass out of the hopper into moon pools which discharge under the vessel's keel. There are six moon pools in total, three on each side of the hopper on the vessel.

13. The barge slowly fills with sand with excess water flowing into the moon pools. As the level of sand increases in the hopper, boards are used to retain it in the hopper whilst still allowing the sediment laden water to pass out over these boards.

14. The *William Fraser* will be operated in a consistent manner in terms of direction and speed (1.5-2.5 knots). The Master of the *William Fraser* and crew must remain vigilant for marine wildlife during extraction and be prepared to shutdown extraction if a large whale (killer whales and larger, including all baleen whales) is sighted within 100m from the vessel. In these circumstances, extraction will not recommence until the large whale has been resighted and has moved away from the draghead/vessel, or until there has been no further sightings for 10 minutes.

15. The vessel will travel an expected distance of 13km for each trip. It is anticipated that 2 full passes of the extraction area will be needed on average to fill the hopper with 923 m^3 of sand. These paths are predetermined and input into the navigation software TimeZero for the vessel to follow to ensure even extraction across the ASEA. MBL expects the time it will take to fill the hopper with sand will be between 2.5 and 3.5 hours.

16. Once the vessel hopper is full or at sand volume capacity (923m^3), the pump will be lifted to no greater than 3 m off the sea floor and water will be pumped through the system to ensure that all the sand has been flushed from the pipes and screen deck. Once complete, the pump will be turned off and the draghead raised and stowed back on board the vessel.

17. The tracking software will turn off once the draghead is lifted from the seafloor and the Master of the *William Fraser* will turn off the vessel tracking on the MAXsea navigational software.

18. A typical return trip from the Port of Auckland ranges from 16-20 hours, depending on weather and sea conditions.

19. If the *William Fraser* delivers the sand to the Port of Tauranga, it will follow the route below in Figure 4, transit time to Tauranga is approximately 17 hours.

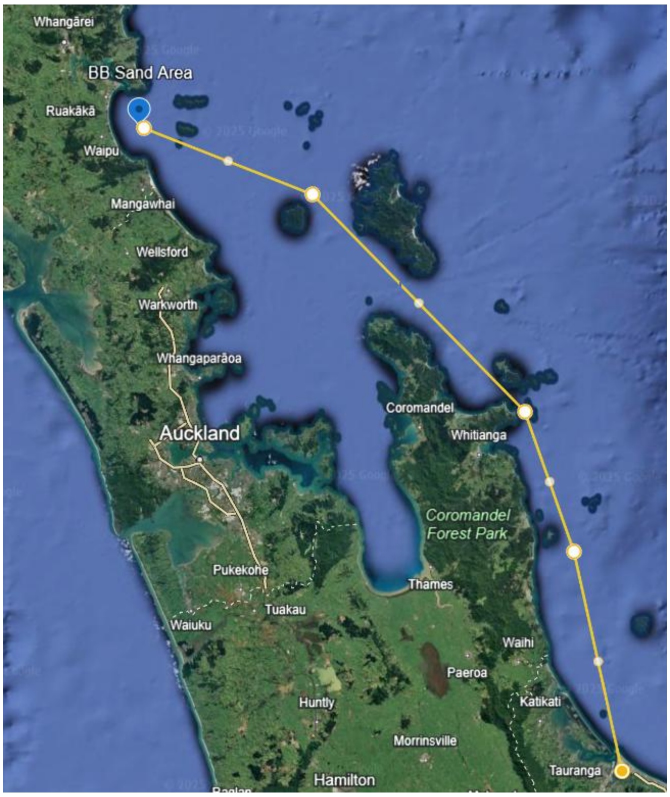


Figure 4: Map showing the trip route from Te Ākau Bream Bay to the Port of Tauranga. Source: Google Maps.

20. If the *William Fraser* delivers the sand to Port Nikau (Whangārei Harbour) it will follow the route below in Figure 5 (below), transit time is approximately 2 hours.

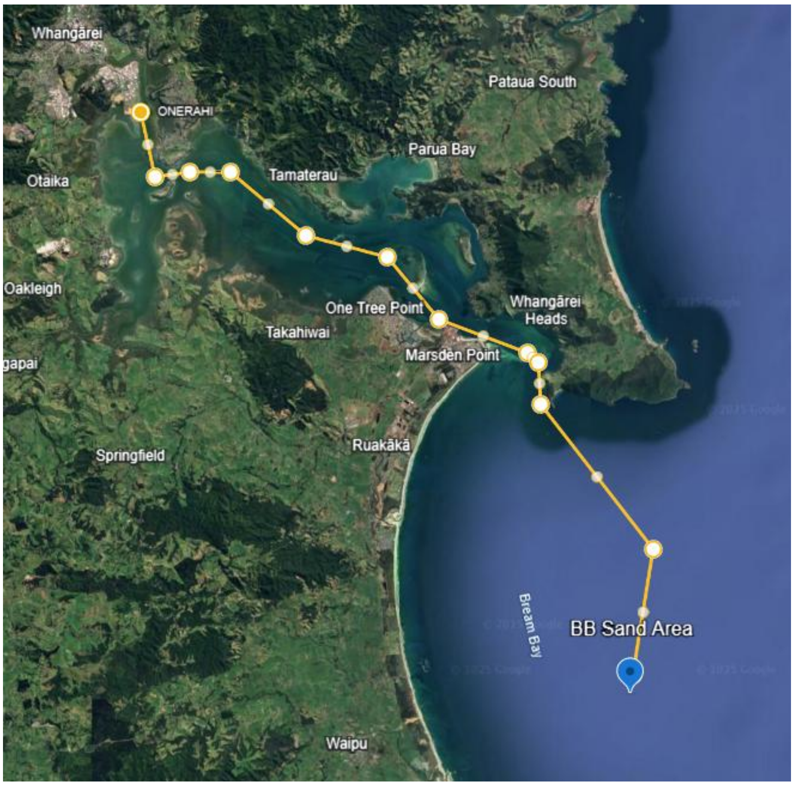


Figure 5: Map showing the trip plan from Te Ākau Bream Bay to the Port Nikau (Whangārei) Source: Google Maps.

21. When the vessel returns to the Port of Auckland (or any other destination Port) the sand is unloaded using an excavator, onto a stockpiling barge or wharf to drain, after a day or so, the sand is loaded into trucks for distribution to customers or to a land-based stockpile.

2.5 Extraction Management

2.5.1 Extraction Cells

Sand extraction will be spatially distributed across 77 designated extraction cells, each measuring 1,000 m by 200 m. Each cell is uniquely named and numbered to support detailed trip planning and accurate reporting of individual extraction events. These cells form an integral part of the operational plan and provide a structured framework for managing extraction activities, as well as facilitating ongoing ecological and geomorphological monitoring of the site. The naming and numbering system for the extraction cells is illustrated in Figure 6 (below).

2K	3K	4K	5K	6K	7K	8K
2J	3J	4J	5J	6J	7J	8J
2I	3I	4I	5I	6I	7I	8I
2H	3H	4H	5H	6H	7H	8H
2G	3G	4G	5G	6G	7G	8G
2F	3F	4F	5F	6F	7F	8F
2E	3E	4E	5E	6E	7E	8E
2D	3D	4D	5D	6D	7D	8D
2C	3C	4C	5C	6C	7C	8C
2B	3B	4B	5B	6B	7B	8B
2A	3A	4A	5A	6A	7A	8A

Figure 6: Sketch showing the numbering and naming convention of the cells in the ASEA.

2.5.2 Sand Extraction Rotation Methodology

Sand extraction is carried out along predefined lines known as tracks. During a typical extraction event, the vessel extracts sand over a distance of approximately 13 km, usually covering two rows of extraction cells. The actual length may vary slightly from trip to trip, depending on operational conditions.

A rotational methodology is used to ensure that extraction does not occur along the same track for at least 12 months at the 250,000 m³ volume over 32 years. Whereas, at the 150,000 m³ volume, the return period before repeating the same track is estimated to be approximately 1.7 years (20 months). Given that extraction is proposed to occur three days per week at this volume, this equates to an effective return period of approximately 20 months. This approach promotes even spatial distribution of extraction across the Approved Sand Extraction Area (ASEA) and supports seabed recovery between events.

The first diagram shown in Figure 7 below illustrate the general direction and layout of extraction tracks. The final diagram shows how each extraction cell is divided into 50 parallel track lines, spaced 4 metres apart. The sand extraction is taken approximately along one of these track lines for the length of the sand extraction area (excluding any cells not covered by the ASEA).

With 50 track lines in each cell, this allows for a total of 550 sand extraction tracks across the ASEA. Since the vessel will cover two rows of cells during an extraction trip, this means there is a total of 275 trips before sand extraction revisits the original track line again.

The combination of the vessel-tracking software and the swell compensator effectively addresses both the vertical and horizontal components of positional accuracy. The system's integrated horizontal-positioning capability ensures that vessel direction and movement are accurately captured and corrected in real time. Together, these systems provide the required confidence in the reliability of the William Fraser's vessel tracks.

The requirement to report monthly extraction sand extraction volumes for each cell and submit electronic record of the track of the *William Fraser* showing (i) a complete track of the *William Fraser* from the entry point into and departure point from the sand extraction area and (ii) a track of the *William Fraser* showing when the dredge head is on the seabed extracting sand and when the dredge head is above the seabed and not extracting sand allows for Council to monitor that extraction is occurring evenly across the extraction area.

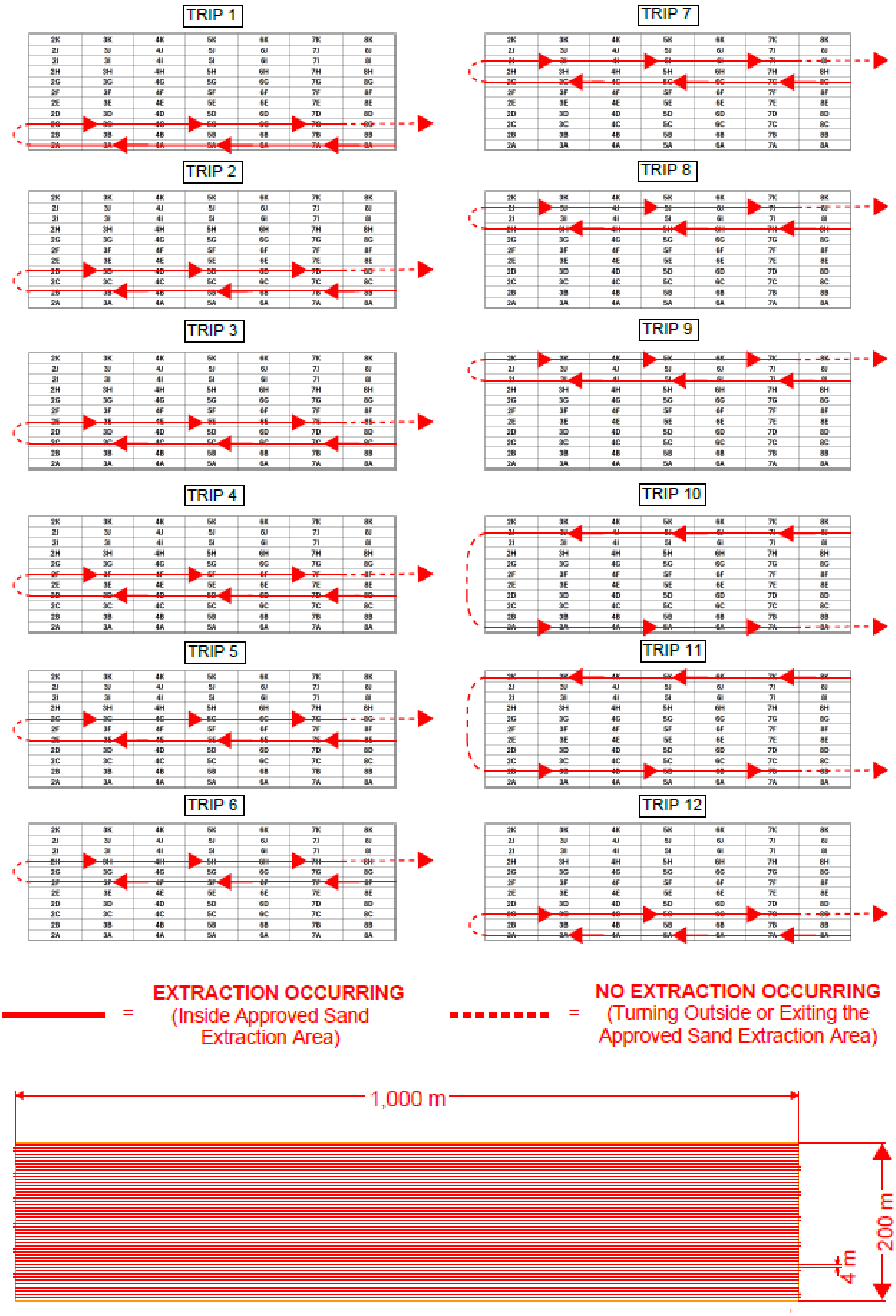


Figure 7: Possible Trip Plan for Te Ākau Bream Bay with the approximate first 12 trips and then what a single cell looks like for a finely scaled interval (4m for this example). Source: MBL.

2.6 Extraction Volume Reporting

The volume of sand extracted from each cell and location of each extraction track is recorded through the following steps:

1. Upon the draghead touching the seafloor to commence extraction, MAXsea navigational software begins recording the position of the vessel as it moves along the extraction track in the form of GPX location data points.
2. The GPX data (location data points) related to the position of the vessel is then automatically entered into ArcGIS, an online geographic information software.
3. For each extraction trip, the GPX track (Figure 8) is analysed to determine the total distance travelled, and the proportional distance travelled within each cell is calculated. These percentages of distance travelled per cell are then applied to the total extracted volume from the corresponding trip, allowing an estimated volume to be allocated to each cell.
4. The estimated volume extracted per cell is calculated using the following formula:

Volume Extracted per Cell = (Total Volume Extracted / Total Distance Travelled) x (Distance Travelled in Cell)

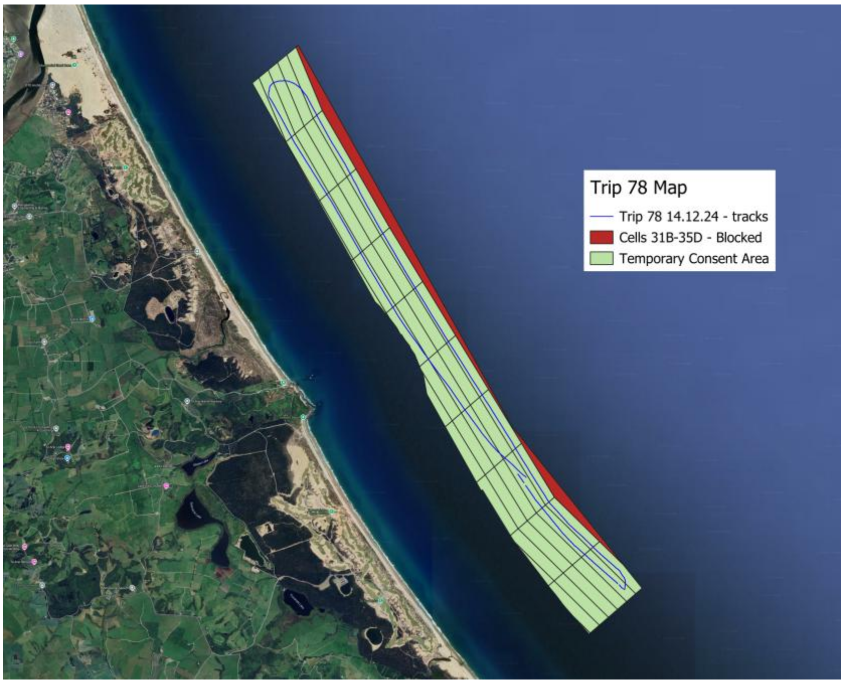


Figure 8: An example of a GPX extraction track (blue line) at Pakiri. Source: MBL.

5. These volumes are then entered into the “Cell Return Spreadsheet”. This spreadsheet also calculates a heat map, displaying a percentage of the remaning volumes to be extracted from an individual cell. These live spreadsheets are shared with the *William Fraser* crew weekly, and assist in the planning for future extraction. An example of this spreadsheet currently used Pākiri as part of MBL’s current extraction reporting is shown in Figure 9 below.

6. The sand extraction reports are then provided to Northland Regional Council on a quarterly basis.

MONITORING CELLS

Extraction Monitoring Cell Numbers

31B	31D	32B	32D	33B	33D	34B	34D	35B	35D
31A	31C	32A	32C	33A	33C	34A	34C	35A	35C
21B	21D	22B	22D	23B	23D	24B	24D	25B	25D
21A	21C	22A	22C	23A	23C	24A	24C	25A	25C
11B	11D	12B	12D	13B	13D	14B	14D	15B	15D
11A	11C	12A	12C	13A	13C	14A	14C	15A	15C
								5B	5D

(1) Volume **Extracted** from Monitoring Cells (per 12-month rolling period)

Volumes Extracted (m3)

0	0	0	0	0	0	0	0	0	0
910	1358	1258	1153	1258	1315	1459	1711	1543	966
1468	1526	1566	1460	1297	1463	1504	1715	1898	1611
1143	1538	1620	1515	1824	1259	1330	1344	1387	1059
1387	1451	1445	1423	1430	1681	1496	1255	1495	1555
228	0	0	0	0	807	1547	2060	1508	1205
								358	571

(2) Volume **Remaining** in Monitoring Cells (per 12-month period)

Volumes Remaining (m3)

Percentage Remaining (%)

64	46	50	54	50	47	42	32	38	61
41	39	37	42	48	41	40	31	24	36
54	38	35	39	27	50	47	46	45	58
45	42	42	43	43	33	40	50	40	38
					38	23	18	40	52
								28	62

Volume Remaining (m3)

1590	1142	1242	1347	1242	1185	1041	789	957	1534
1032	974	934	1040	1203	1037	996	785	602	889
1357	962	880	985	676	1241	1170	1156	1113	1441
1113	1049	1055	1077	1070	819	1004	1245	1005	945
572	200	500	500	200	493	453	440	992	1295
								142	929

Figure 9: Cell Return Spreadsheet Record at Pakiri. Source: MBL.

2.6.1 Sand Extraction Volume and Location

As part of this process, MBL will record and report:

1. The date, time and sea conditions during the period of extraction and the water depth of extraction. The volume of sand extracted from each cell where extraction has occurred.
2. The total volume of sand extracted. In the event that the William Fraser is not fully loaded, MBL may report the volume of the incomplete load calculated from the onboard sensors measuring compliance with the load line marked on the vessel's hull in accordance with Maritime NZ requirements before any unloading of sand. The record must include for each load:
    a. A screenshot or other verifiable way of showing the date and time, and the reading of the sensors.
    b. The volume of the load by reference to the load-line.

3. An electronic record of the track of the William Fraser (using a GPX file format or equivalent) and mapped using a differential global positioning system ("DGPS") showing:
    a. A complete track of the William Fraser from the entry point into and departure point from the sand extraction area.
    b. A track of the William Fraser showing when the dredge head is on the seabed extracting sand and when the dredge head is above the seabed and not extracting sand.

2.6.2 Monitoring Extraction

The monitoring of sand extraction and effects is comprised of:

1. Recording and reporting volumes of sand removed from each cell to ensure an even spread across the whole site on a quarterly basis, along with a running record of the total volume of sand extraction for that month, year and consent period;
2. Benthic ecological sampling to measure and look for potential change in biota across the site and relating this to the extraction intensity and the control cells;
3. Bathymetric surveying to look for seafloor height changes;
4. Topographic surveying to determine any changes in the foreshore and dune environments;
5. Marine mammal and reptile monitoring to record any sightings or interactions; and,

6. Sea and shorebird monitoring to record any interactions[1] (e.g. bird strike).

A finer scale map of the extraction and monitoring cells is provided below as Figure 10, showing the sand extraction with monitoring cells (each cell is 1000 m x 200 m).

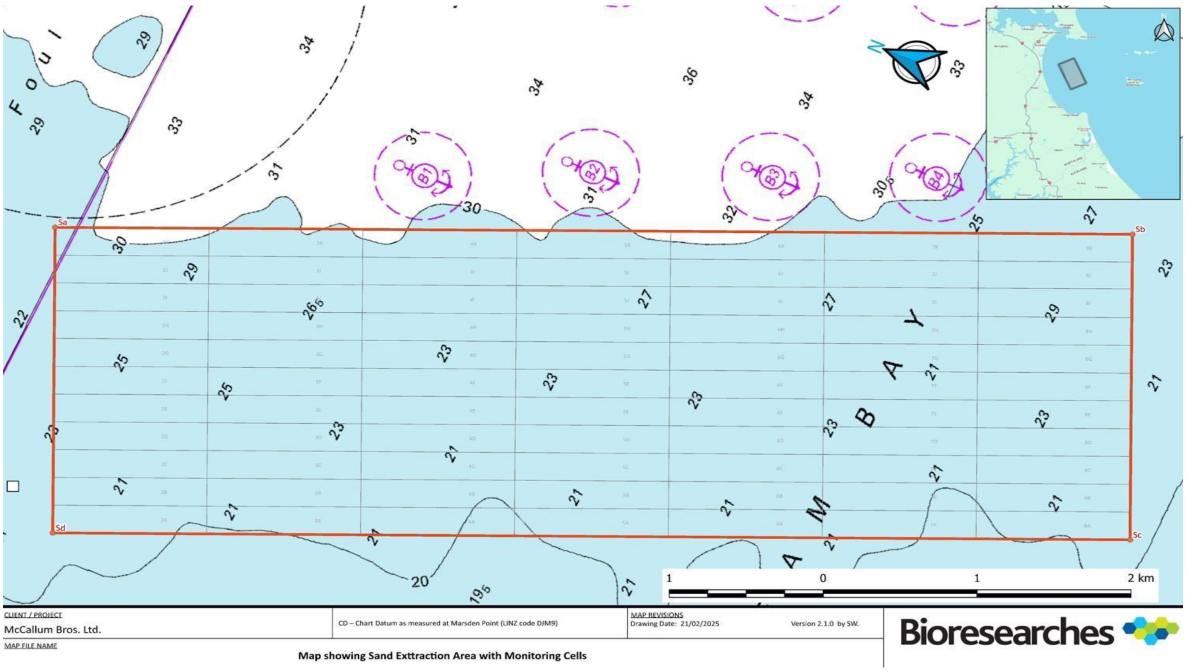


Figure 10: Map showing the sand extraction with monitoring cells (each cell is 1000 m x 200 m). Source: Bioresearches 2025. Assessment of Ecological Effects – benthic ecology.

2.6.3 Internal proceedure for closing cells

Sand extraction must be limited to the Approved Sand Extraction Area (ASEA) within the Extraction Area as identified in Figure X or any subsequent ASEA included in any PSEAR or SEMR.

An ASEA must not include areas of the seafloor which contain any of the following:

a) Sediment with an average proportion of mud (grain size finer than 0.063 mm) exceeding 20% by weight; or

b) Areas of immobile layers (e.g. rock) or historic facies (e.g. partly consolidated orange Pleistocene sand deposit); or

c) Sensitive benthic communities (as defined by Attachment Four); or

d) Any absolutely protected species under the Wildlife Act 1953, excluding any species for which a Wildlife Authority is held; or

[1] A 'seabird interaction' should be limited to birds that are injured or killed and found on deck (David Thompson, NIWA pers comms).

e) Extraction track(s) with a width less than 2 m and a depth exceeding 0.4 m below the surrounding seabed level and longer than 100 m in length.

In the event that during extraction a discovery of one or more of those matters listed as a) to e) occurs then sand extraction within that cell is to cease immediately until such time that sand extraction in that cell is approved though the Pre-Sand Extraction Area Report (PSEAR) process. MBL's internal steps to close a cell are set out as follows:

1. Discovery of one or more of those matters listed as a) to e) above.
2. The Environmental Manager closes the cell(s) in the ASEA (Figure 11) and advises all MBL staff, including the Managing Director, Chief Operating Officer, Operations Manager, Compliance Manager, Compliance Officer and the Master of the *William Fraser* (refer to Appendix 6 in regard to the roles and responsibilities of MBL staff).

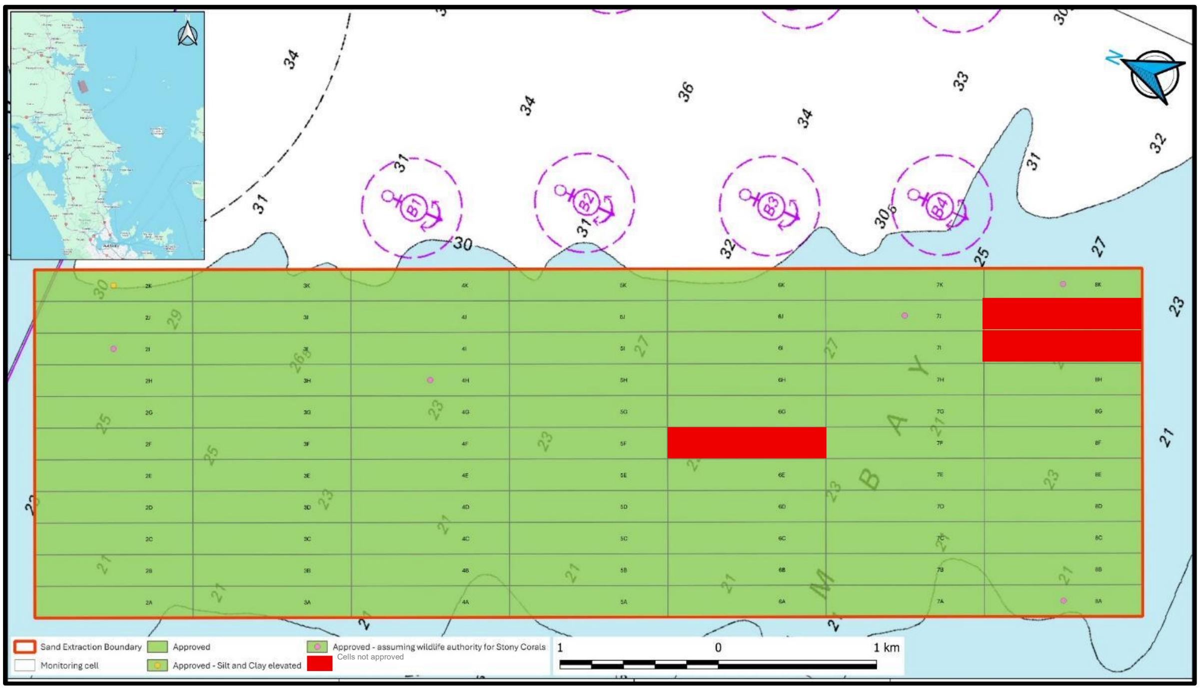


Figure 11: Example of closed cells in the ASEA.

3. The Compliance Officer will close the cell(s) on the Geolocated QGIS software for vessel navigation, and reporting purposes.
4. The Environmental Manager will also advise the Council, Ngātiwai Trust Board, Te Pouwhenua o Tiakiriri Kukupa Trust, and Patuharaheke Te Iwi Trust Board for their information.

3.0 Overview of Operational Procedure

(1) Operations Manager confirms weather etc suitable for voyage

(2) MBL Environmental Manager emails *William Fraser* Trip Plans with comments weekly

(3) Master of *William Fraser* confirms receipt of trip plan by email

(4) The *William Fraser* is navigated to the start position of extraction trip

(5) *William Fraser* follows extraction plan through designated extraction cells

(6) GPX Track begins recording when draghead lands on the seafloor

(7) Track is recorded on Timezero as back up, with Master marking start position

(8) *William Fraser* ceases extracting when average draft is 4.2m (~923m^3)

(9) Master retrieves dredging gear and GPX automatically stops recording, Master marks end of extraction track

(10) Compliance Manager monthly removes storage drive from William Fraser and replaces with MT drive, full drive taken to Head Office

(11) Compliance Officer downloads extraction track and calculates trip volumes per extraction cell

(12) Compliance Officer creates heat map and Cell Return Spreadsheet

(13) Environmental Manager submits a Quarterly Report including the Cell Returns to Council with commentary

Figure 12: Overview of General responsibility flow diagram (Top to Bottom).

4.0 General Compliance Protocols

4.1 Compliance with the Maritime Transport Act 1994

The Maritime Transport Act 1994 is the primary legislation that describes the role and functions of Maritime New Zealand (MNZ) and the Director of MNZ. This legislation sets out the legal framework for maritime safety and protection of the marine environment, including:

1. Licensing of ships and crew
2. Investigation of maritime accidents
3. Offences, response for oil spills planning and preparedness
4. Other aspects of maritime law such as salvage, liability for pollution damage, limitation of liability, and compensation (Maritime New Zealand, 2025)

This act also provides for the Minister of Transport and Governor General to make maritime and marine protection rules. These rules contain the detailed standard and requirements that the Maritime community are required to comply with.

A separate Oil Spill Contingency Plan has been approved by MNZ to provide guidance to the master and officers on board the ship with respect to the steps to be taken when a pollution incident has occurred or is likely to occur. As well as a separate Garbage Management Plan which has also been approved by MNZ taking into account the regulations of Annex V, Regulation 10 in the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which indicates placards, garbage management plans, and garbage record keeping requirements.

4.2 Compliance with the Maritime Security Act 2004

This Act brought into domestic law New Zealand's obligations under the International Maritime Organization's International Ship and Port Facility Security Code (ISPS Code) (Maritime New Zealand, 2025). However, in this case is the ISPS Code is not relevant for the purposes of this application.

4.3 Compliance with the Ship Registration Act 1992

MNZ are required to maintain the New Zealand register of ships – a list of all vessels registered as New Zealand ships. For some New Zealand ships it is compulsory to be registered. For others it is voluntary (Maritime New Zealand, 2025). All vessel under MBL's fleet are registered with MNZ and compliant with the purposes and functions of this Act.

4.4 Compliance with the Port of Auckland Hauraki Gulf Transit Protocol

As per Section 4.3 in the Marine Mammal Management Plan (MMMP), during transit to and from the extraction area, the master of the *William Fraser* will ensure that the vessel is operated in compliance with the voluntary Hauraki Gulf Transit Protocol (Appendix 1). This protocol will be implemented throughout the entire transit route, i.e. not only in the Hauraki Gulf.

The requirements of the Hauraki Gulf Transit Protocol which must be followed include:

1. A maximum transit speed of 10 knots (note the operational limit in Section 3.1 above restricts the *Wiliam Fraser* to a maximum of 9.5 knots);
2. A crew member must be assigned to keep watch for whales during daylight hours;
3. In the event a whale is sighted forward of the vessel beam, the vessel master should slow down and/or change course to keep as far from the whale as possible. Whenever safe to do so, no vessel should pass closer than 1,000 m from a whale; and
4. All whale sightings inside the Hauraki Gulf should be reported immediately to the Ports of Auckland Harbour Control (this acts as a reporting and warning system for other vessels in the area). The reporting procedure outlined in Appendix 1 should be followed.

The abovementioned points will be implemented and addressed as part of MBL's MMMP. The only permitted exception to the Hauraki Gulf Transit Protocol is that the William Fraser may travel inshore of the recommended transit route.

4.5 Protocols to Minimise the Risk of Vessel Collisions and Incidents

Incidents at sea can include a wide range of maritime accidents, including but not limited to collisions, fire, groundings, Man Overboard, Oil Spill etc. The McCallum bros Fleet have had no grounding or oil pollution incidents in the Mangawhai-Pākiri embayment.

All MBL vessels operate in accordance with the Maritime New Zealand Safety Management framework (MOSS) and the Relevant Harbourmaster Bylaws, regulations and COLREGS which are documented in the Company MTOP (Marine Transport Management Plan).

4.6 Protocols to Minimise Underwater Noise

As per Section 3.0 in the MMMP, underwater noise levels will be minimised during project activities as follows:

1. The *William Fraser* and all equipment on-board, including winches, generators, engines etc., will be regularly serviced and maintained to a high standard;
2. Noise suppression equipment will be used and regularly serviced and maintained to a high standard;
3. Records of service and maintenance will be kept and will be available for inspection; and
4. MBL will actively seek to make improvements to equipment and increase operational efficiency to:
    a. Reduce overall underwater noise outputs; and
    b. Reduce the daily dredging duration.

4.7 Crew Training Protocol

Training is a high priority for the company's management and crew. All Crew members are trained in the use of equipment on board the vessel they are working on, including emergency procedures and drills. The company offers robust training for crew, both induction and refresher. Records are maintained in the business office. Staff meetings are held on a regular basis to discuss any ongoing training requirements.

<u>Inductions:</u>

A Crew Induction Training Record shall be completed for all seafarers when joining the vessel, this record shall be completed, signed and dated by the seafarer and verified by the vessel's Master.

<u>Training:</u>

All seafarers shall complete a robust sign off specific to the role held onboard. These are broken down into Master, Mate, Engineer, Deck Crew. No person shall maintain a solo navigational watch or sole responsibility of their role until the following training is completed to the Master's satisfaction and the Crew Training Record is correctly verified by seafarer and Master. All seafarers onboard in a vessel handling capacity are to complete the Vessel Handling Training Module.

MBL also run an internal Bridge Resource Management Module and Maritime NZ Approved Structured Training Program and Proficiency Plan for Pilot Exempt Masters.

5.0 Lighting Management Plan

5.1 Introduction

The purpose of this Lighting Management Plan is to outline the operational procedures and mitigation measures adopted by MBL to manage artificial lighting aboard the *William Fraser* during sand extraction activities at Te Ākau Bream Bay. The plan ensures that lighting is managed to maintain crew and vessel safety while minimising adverse effects on the surrounding marine environment, particularly in relation to seabird attraction and marine mammal disturbance. This plan has been developed to meet the requirements of the Sand Extraction Operation Plan (SEOP) and integrates relevant best practice guidance, including voluntary mitigation standards for reducing light-induced vessel strikes of seabirds.

The specific objectives of the Lighting Management Plan are to:

1. Ensure vessel lighting meets minimum safety requirements while reducing unnecessary artificial light at sea.
2. Minimise the attraction and disorientation of seabirds and other marine fauna caused by artificial lighting.
3. Describe the location, configuration, and control measures of flood and navigational lighting used on the *William Fraser.*
4. Ensure lighting configurations are consistent with maritime safety rules, particularly Maritime Rules Part 22.
5. Implement and maintain operational practices that support voluntary mitigation standards for seabird protection.
6. Ensure all crew are trained and aware of lighting protocols and wildlife mitigation responsibilities during extraction operations.

Figure 13: William Fraser 's downward facing flood lights while the is actively extracting sand at Pākiri. Image taken from the bow. Source: MBL.

5.2 Lighting Methodology

5.2.1 Flood Lights

The flood lights on board the *William Fraser* are subdued, downward facing, and shielded to avoid light spill over the open ocean. The yellowish-white colour of the flood lights (300-Watt LED lights) are directed over non-reflective surface of the sand within vessel hopper. The vessel uses the lowest intensity lighting appropriate to ensure crew safety with a conservative wattage of 300W. The various lighting locations onboard the vessel are shown in Figure 13 below.

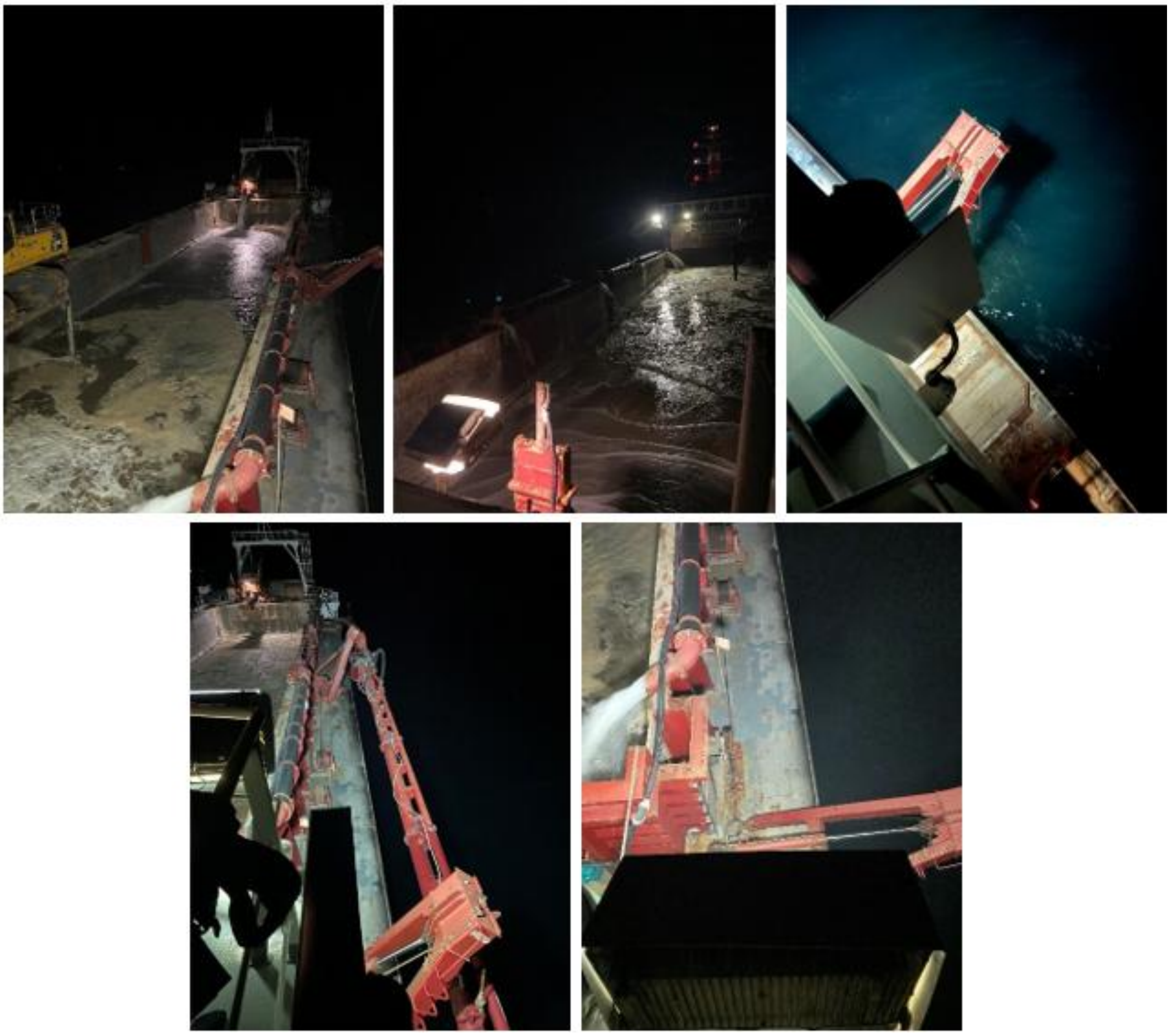


Figure 14: Flood lights on board the William Fraser at Pākiri between 19:00-21:00, on 26 May 2025. Source: MBL.

5.2.2 Navigational Lights

The navigational lights onboard the *William Fraser* are managed in line with MBL's Navigational Light Arrangement Plan (Appendix 2), they have a predetermined intensity, defining specific visibility ranges and the spectral ranges of "white", "red", and "green" lights as per the Maritime Rules Part 22. During extraction operations, the lighting configuration is adjusted to minimise visibility from shore, while maintaining compliance with maritime safety regulations and ensuring the health and safety of the crew and other marine users.

Figure 15: William Fraser's Navigation Lights from the stern of the vessel while in transit. Source: MBL.

Table 2: Location, number and visibility of the lights on board William Fraser.

William Fraser - Navigation Lights			
Location	**Light spectral**	**Number of lights**	**Visibility (Nm)**
Anchor light	White	2	3
Masthead lights	Red-White-Red (RAM Lighting on dredging side of vessel)	3	6
Port and starboard lights	Red (Port) & Green (Starboard)	2	3
Stern light	White	1	3

5.2.3 Anchor light

The *William Fraser* will not be at anchor during any extraction event. Therefore, anchor lights are not a requirement for the purposes of this SEOP. These lights, however, are visible from 3 nautical miles away and are used when the vessel is at anchor.

5.2.4 Masthead lights

The *William Fraser* has two white masthead lights, one at the bow of the vessel and one on the mast which is above the accommodation at the stern of the vessel, which is visible across 225 degrees, 6 nautical miles, and is at least 1m above the RAM (Restricted in Ability to Manoeuvre) lights configured as Red-White-Red.

5.2.5 Port and starboard lights

Port and starboard lights indicate the left and right side of a boat. A red light signifies the port side and green represents the starboard. These lights are visible from 3 nautical miles away and are used when the vessel is moving.

5.2.6 Stern light

The *William Fraser* has a white light signalling the stern of a boat that shines across 135 degrees. The combined visibility of the masthead and stern lights is equal to 260 degrees. The stern light is turned on when the boat is moving and is visible from 2 nautical miles away.

5.2.7 Accommodation and outside lighting

Curtains will be drawn, and external doors closed at all times to prevent light spilling outside of the accommodation block. Exterior outside lights will be turned off and crew working outside will require head lamps to operate safely.

5.3 Lighting Management

During transit to the extraction area, and while extracting, the *William Fraser* will pass through areas that may contain protected marine species, including marine mammals and seabirds (Appendix 3). It is therefore important to use a structured approach to mitigate the risk of these species. Described and agreed daily practices include:

- Lighting is reduced to minimum requirements and intensity for operations and safety
- Non-essential activities requiring external lighting at night are avoided
- High-risk areas are avoided when using external lights

- Black-out curtains (on the cabin port holes) and amber (blue and violet-filtered) lights are used as appropriate
- Essential lights are shielded, angled, and/or positioned to only light required areas

5.3.1 Reducing Light-induced Effects to Seabirds

Seabirds are susceptible to disorientation from artificial lights at night, which can lead to vessel strikes. Such collisions may result in physical injury, loss of waterproofing and drowning. To mitigate these risks, MBL ensures that all crew members are trained in safe seabird handling and release techniques (refer to Appendix 4), recognising that vessel strikes can also result in direct mortality.

Whilst ensuring safe operating standards, MBL will minimise additional and unnecessary lighting so as not to attract or disorientate seabirds. As described in Mitigation Standards to Reduce Light-induced Vessel Strikes of Seabirds with New Zealand Commercial Fishing Vessels, the desired mitigation strategy outcomes are to:

> **Outcome 1:** The number of vessel-struck seabirds due to light-induced disorientation and attraction to vessels is minimised
>
> **Outcome 2:** Vessel-struck seabirds have a maximum chance of survival

Although there are currently no mandatory lighting mitigation regulations, MBL has voluntarily adopted these Mitigation Standards and integrated the necessary equipment and operational practices to support each desired outcome. These practices will be updated as new technologies or more effective operational procedures become available and are proven to meet or exceed current mitigation expectations.

5.3.2 Desired Outcome 1: Minimise the seabird vessel strike due to light-induced disorientation and attraction to vessels.

Mitigation Standards 1.1 to 1.7 (in order of effectiveness) shown in Table 3 below are necessary to achieve Desired Outcome 1.

Table 3: Mitigation Standard for Outcome 1 for William Fraser.

Mitigation Standard	Requirement	William Fraser
1.1	Lights that are not essential for operations and/or vessel/crew safety are eliminated.	MBL's vessel the William Fraser does not have any lights on board that do not serve purpose. All lighting on the vessel is essential for operations and the safety of the vessel and crew.
1.2	Activities requiring external lighting at night are avoided whenever possible.	All activities that require external lighting are avoided where possible other than lights that are required for operations and the safety of the crew (i.e., head torches).
1.3	High-risk areas are avoided at high-risk times when using external lighting at night.	All high-risk areas on the *William Fraser*, such as the hopper and loading davits, are avoided by the crew when using external lighting at night.
1.4	All essential lights are shielded, angled, and/or positioned to only light areas required for operations and safety and minimise light spill.	As mentioned in Section 8.1 of this SEOP, the William Fraser's lights are shielded, angled, and/or positioned to only light areas required for operations and safety such as the hopper to avoid light spill over the open ocean.
1.5	All essential lights use the lowest intensity as appropriate for operations and vessel/crew safety.	All essential lights, such as the light to illuminate the hopper use the lowest intensity bulbs as appropriate for operations and vessel/crew safety.
1.6	Windows are blacked out wherever and whenever practical (e.g., while at anchor).	The bridge of the William Fraser has lights that are required to be turned on for vessel operations/crew safety. The vessel does not have any other windows below the bridge, and the vessel will not be at anchor during an extraction event.
1.7	All essential lights filter light spectra as appropriate for operations and vessel/crew safety.	Seabirds, and wildlife in general, are less attracted to warmer lights such as amber lights without blue and violet wavelengths. As mentioned in Section 8.1, the *William Fraser* has three yellowish-white coloured flood lights (300 Watt LED lights) (which direct light spectra over the non-reflective surface of the sand within vessel hopper (Figure 12).

5.3.3 Desired Outcome 2: Maximise the chance of survival for vessel-struck seabirds

Mitigation Standard 2.1 shown in Table 4 below is necessary to achieve Desired Outcome 2.

Table 4: Mitigation Standard for Outcome 2 for William Fraser.

Mitigation Standard	Requirement	William Fraser
2.1:	Seabirds are handled and released in ways that maximise their chance of survival (whilst managing the risk to the crew)[2].	MBL's crew will follow the Department of Conservation's Handling and Release Guide for protected species interactions (Appendix 6).

To meet Mitigation Standard 2.1, vessel operators (Master *William Fraser*) should:

- Instruct the deck crew in safe seabird-handling procedures and protocols and ensure these procedures and protocols are adhered to.
- Take care not to release waterlogged seabirds, instead allow them to dry and recover in a box. Do not place more than one bird in a box.

6.0 Management plan review

A review of this SEOP will be undertaken annually by a SQEP(s) from MBL. This review will assess if any changes in the sand extraction methodology can be practically implemented.

[2]https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-conservationservices/resources/protected-species-handling-guide-20192.pdf /

Appendix 1: Hauraki Gulf Transit Protocol for Commercial Shipping

Reducing the risk of whale deaths

1. Plan to slow down

The best way to reduce the risk is to slow down and avoid areas with the most Bryde's whales. The risk to whales is substantially lower from ships travelling at 10 knots compared to 15 knots or more.

- Plan your voyage so that whenever possible you transit the Hauraki Gulf at 10 knots, when outside the Auckland Pilotage Area.
- Approach and depart Port of Auckland using the recommended route as outlined in the New Zealand Annual Notices to Mariners, Section 10: Shipping routes around the New Zealand coast.

Adherence to this route will narrow the area of the Hauraki Gulf transited by large vessels and help reduce the risk of collision with a whale.

2. Watch for Bryde's whales

If you see a whale, you can avoid it. Having a dedicated observer scanning ahead with binoculars will help to detect whales at greater distances.

When transiting through the Hauraki Gulf, vessels are required to post whale lookouts during daylight hours.

If a whale is sighted forward of the beam, slow down and/or change course to keep as far from the whales as possible. Whenever safe to do so, no vessel should pass closer than 1,000 metres from a whale.

The image on this document is provided to help crew identify Bryde's whales.

Recommended approach to Port of Auckland

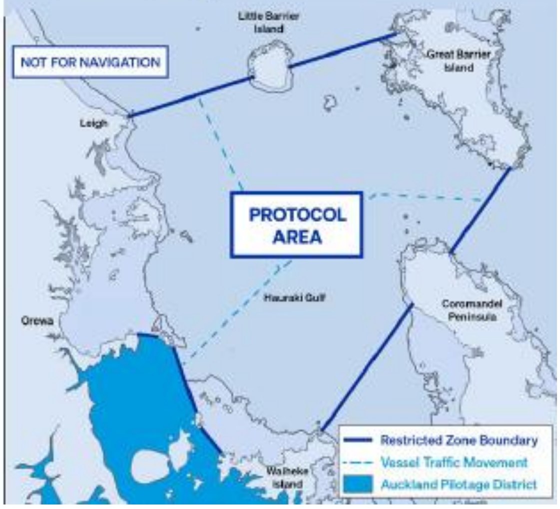
From the north:
Enter Hauraki Gulf (Tīkapa Moana) through Jellicoe Channel keeping at least 3 nautical miles off land, thence at least 3 nautical miles off Flat Rock, then pass through a point midway between Shearer Rock and The Noises (at least 3 miles off Shearer Rock) before proceeding westwards to intercept the sector light at St Leonards beach and thence to the Pilot Station.

Extract from Annual New Zealand Notice to Mariners. No. 10.

From the east:
Enter Hauraki Gulf (Tīkapa Moana) through Colville Channel keeping to the north of Channel Islands and thence to the Pilot Station.

The routes should be reversed for departing vessels.

Ships are to keep at least 5 nautical miles off the land, any charted danger, or any outlying islands, until reaching a position where alteration is required to make port.



3. Report on whale sightings

Port of Auckland's Harbour Control operate a whale reporting and warning system for vessels transiting the Hauraki Gulf. Whale sightings are relayed to all vessels in the Hauraki Gulf so that whales can be avoided.

All whale sightings should be immediately reported to Harbour Control as follows:

— "Auckland Harbour Control, Auckland Harbour Control, Auckland Harbour Control."

— "This is: [Vessel name, vessel name, vessel name]"

— "Whale sighting report."

On making contact, please provide the following information:

- Position of sighting, either latitude and longitude or bearing and distance from a known landmark.
- Number of whales sighted.
- Direction of movement in terms of three figure notation in degrees or as compass points.

Harbour Control will inform all other vessels in the Hauraki Gulf area of whale sightings, in the following format:

— "All stations, All Stations, All Stations"

— "This is Harbour Control, Port of Auckland." "Sighting of [number] of large whale(s)."

— "At [location]"

— "Direction of whale travel is [..............]"

— "If possible, please avoid the vicinity, increase lookouts and reduce speed."

— "Out"

This protocol is a voluntary measure agreed between the Port of Auckland and the shipping industry. It contains reasonable, practical measures which should, if widely adopted, reduce the number of whale deaths caused by vessels.

The protocol can only be effective if shipping lines and ship masters co-operate. By taking avoidance measures, planning ahead, and reducing speed whenever schedules permit, the industry will be able to address an issue of growing public concern.

Port of Auckland

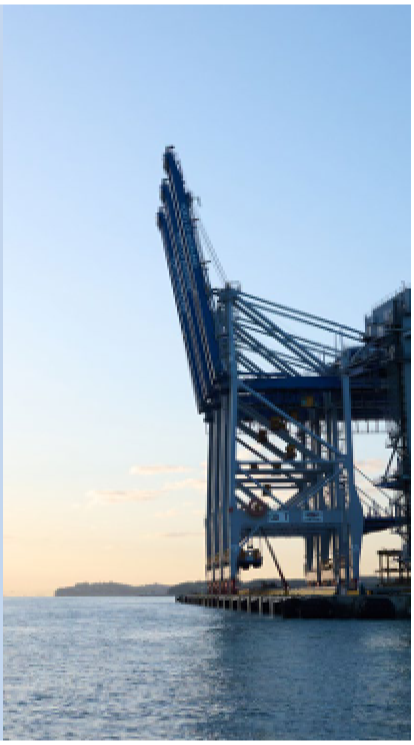
Port of Auckland is located on the east coast of New Zealand's North Island, in the Hauraki Gulf (Tīkapa Moana) Marine Park. While not endangered world-wide, the Hauraki Gulf is one of the few places in the world with a semi-resident population of Bryde's whales – a locally endangered species in New Zealand. Bryde's whales are vulnerable to ship strike which is a threat to the local population's long-term survival.

In September 2013, Port of Auckland, working with the shipping industry, New Zealand's Department of Conservation (DOC), Auckland University, iwi, and other key stakeholders, developed a voluntary protocol for large ships travelling through the Hauraki Gulf."

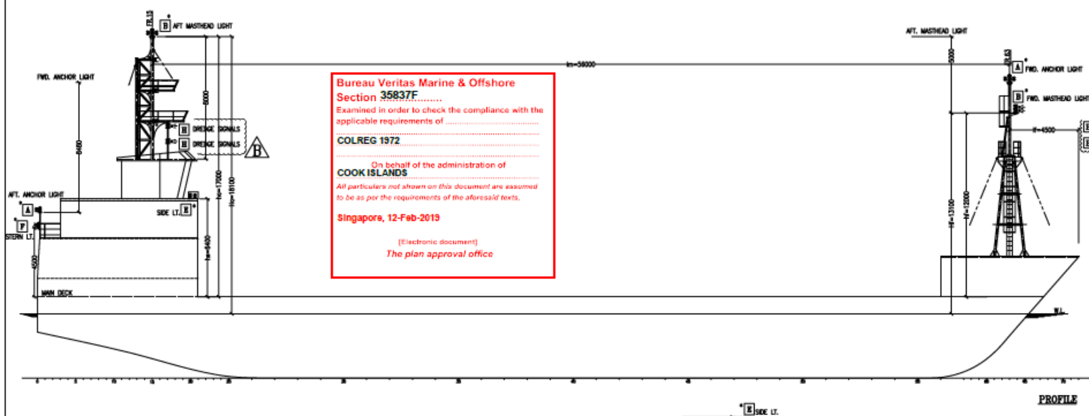
The protocol's main aim is to lower vessel speeds and reduce the risk of collisions between whales and ships. This protocol consists of four main elements which outlines the steps ship masters should take when planning their passage to and from Auckland, and what to do while transiting the Hauraki Gulf. Your commitment to helping protect the local Bryde's whale population is greatly appreciated.

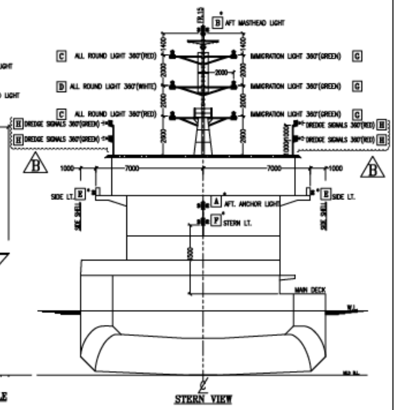
Roger Gray

Roger Gray
Chief Executive Officer,
Port of Auckland

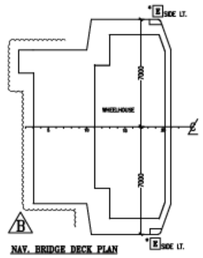


Appendix 2: Navigational Light Arrangement Plan





Bureau Veritas Marine & Offshore
Section 35837F
Examined in order to check the compliance with the applicable requirements of
COLREG 1972
On behalf of the administration of
COOK ISLANDS
All particulars not shown on this document are assumed to be as per the requirements of the aforesaid texts.
Singapore, 12-Feb-2019
[Electronic document]
The plan approval office



NAV. BRIDGE DECK PLAN

NOTES:-

1. SHIPBUILDER TO CHECK ALL LIGHT SEATING'S DIMENSIONS AGAINST ACTUAL PURCHASED ITEMS & CORRECTED TO SUIT WHERE NECESSARY.
2. ALL WELDS & EDGE PREPARATION TO BE IN ACCORDANCE WITH CLASS REQUIREMENT.
3. THREE BLACK BALLS, ONE DIAMOND SHAPE, SHIP WHISTLE & BELL TO BE SUPPLIED.
4. ONE SET OF NATIONAL & INTERNATIONAL CODE OF SIGNALS & ONE DAY LIGHT SIGNALLING LAMP WITH EMERGENCY SOURCE OF POWER TO BE SUPPLIED.
5. THE SIDELIGHT OF VESSEL SHALL BE FITTED WITH INBOARD SCREENS PAINTED MATT BLACK.
6. ALL THE LIGHTS, SHAPES AND WHISTLES ARE TO BE OF APPROVED TYPE BY THE ADMINISTRATION.

MARKS	DESCRIPTION OF LIGHTS	QTY.	ARC OF VISIBILITY	REMARKS
A	ANCHOR LIGHT (WHITE) *	2	360°	3 MILES
B	MASTHEAD LIGHT (WHITE)*	2	225°	6 MILES
C	ALL-ROUND LIGHT (RED)	2	360°	3 MILES
D	ALL-ROUND LIGHT (WHITE)	1	360°	3 MILES
E	SIDE LIGHT (PORT-RED, STBD-GREEN)*	2	112.5°	3 MILES
F	STERN LIGHT (WHITE) *	1	135°	3 MILES
G	IMMIGRATION LIGHT (GREEN)	3	360°	3 MILES
H	DREDGE SIGNALS (PORT-GREEN, STBD-RED)	4	360°	3 MILES

* TO BE DUBLICATE LAMPS.

PARTICULARS OF SHIP:-

L.O.A = 68.00M	$X = \frac{Hf\ (lf + lm) - Ha \times lf}{Ha - Hf}$
B = 16.00M	$= \frac{13.100(4.50+56.00) - 18.10 \times 4.50}{18.10 - 13.10}$
D = 5.300M	
d (DESIGN) = 4.200M	$= 142.22\ (M) < 1000\ (M)$

FOR APPROVAL

DATE	MODIFICATION	REV	BY
30.11.18	AMENDED AS PER BUILDER'S REQUEST.	B	HONG
08.09.18	AMENDED AS PER BUILDER'S COMMENTS.	A	T.K.WONG
	REFERRING TO YARD'S COMMENT ON 29.08.18,		
	REQUESTING FORWARD MAST LIGHT DESIGN TO BE CHANGED.		

UNITED SHIP DESIGN
(NAVAL ARCHITECTS)
NO.4, 1ST FLOOR, LORONG CHENGAL 2,
96000 SIBU, SARAWAK, MALAYSIA.
TEL : +6084-325825, FAX : +6084-333825
EMAIL : usdesign@usdesign.com.my
WEBSITE : www.usdesign.com.my

SHIP: 68M LANDING CRAFT

TITLE: NAVIGATION LIGHT ARRANGEMENT

OWNER					
BUILDER	BERJAYA DOCKYARD SDN BHD				
CLASS	BV		HULL NO.	BJ98	
DRAWN	CHECKED	APPROVED	SCALE	DRAWING NO.	REV.
HONG 02.08.18	T.K.WONG 30.08.18		1 : 170 (A2)	US/786-F4	B

UNITED SHIP DESIGN SDN. BHD. 541859-X
13 DEC 2018

Appendix 3: Fisheries New Zealand – Protected Species Information for Commercial Fishers

Fisheries New Zealand
Tini a Tangaroa

Protected Species Information for Commercial Fishers

Tākoketai/Black Petrel

Where are black petrels?

Breeding location: Tākoketai/Black petrel breed only in New Zealand. There are two remaining breeding colonies found in the Hauraki Gulf on Aotea/Great Barrier Island and Te-Hauturu-o-Toi/Little Barrier Island.

Breeding time: Tākoketai/Black petrel breed from October through to June each year. When they are not breeding, they migrate to South American waters to forage and feed.

Foraging distribution: Tākoketai/Black petrels forage and feed in the entire inshore area of the East Coast of the North Island from Mahia to Kaitaia. Their distribution is focused on deeper water near the continental shelf, with concentrations found closer to Great Barrier Island where they breed. Offshore they extend and are found on the East and West of the North Island.

How to recognise black petrels

Tākoketai/Black petrels are black or very dark brown, with black feet. The bill is pale yellow with a black tip and a distinctive double tube nostril on top.

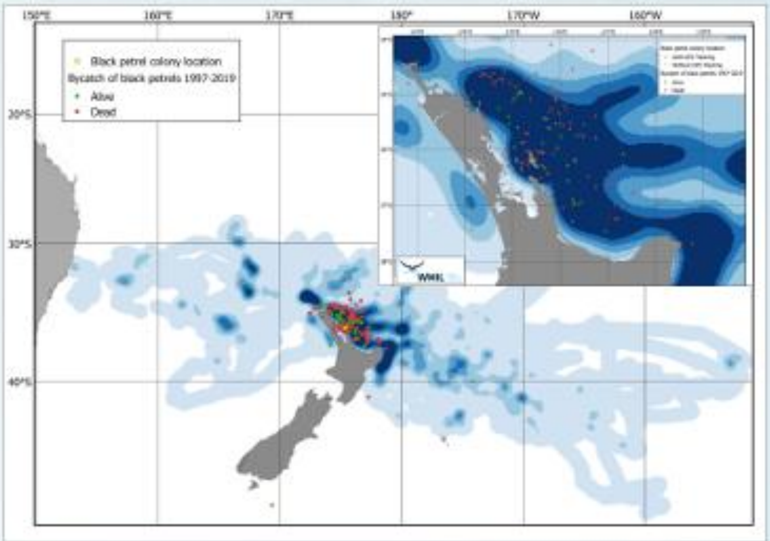
Distribution Map:

The distribution map shows where Tākoketai/black petrels are more likely to be found during the breeding season and where bycatch has occurred.

The dark blue areas indicate where numbers are most concentrated (hot spots) for foraging and feeding. These areas are also where most captures have been reported.

This data was accumulated from 1997 to 2019 breeding seasons.

It is not illegal to capture seabirds. IT IS ILLEGAL not to report captures of seabirds.



For more information on what to do when you have caught a bird, please refer to your Operational Procedures for Protected Species Risk Management document.

Fisheries New Zealand
Tini a Tangaroa

Protected Species Information for Commercial Fishers

Toanui/Flesh-footed Shearwater

Where are flesh-footed shearwaters?

Breeding location: Toanui/Flesh-footed shearwaters breed on islands off the coast of north of New Zealand and in the Marlborough Sounds, Australia, and on St Pauls Island in the Indian Ocean. Mauima/Lady Alice Island, Northland Ohinau Island, Coromandel and Titi Island, Marlborough also carry large colonies.

Breeding time: Toanui/Flesh footed-shearwaters breed from September to May. When they are not breeding, they migrate to the Northern Hemisphere to forage around Japan, India, and North America.

Foraging distribution: Toanui/Flesh-footed shearwaters forage and feed in the entire inshore area of the North Island and the upper South island, with concentrations found closer to where they breed. Offshore they extend and are found on the East and West of the North Island. They are active at the day and night during their breeding season, with most feeding occurring during the day.

How to recognise flesh-footed shearwaters

Toanui/Flesh-footed shearwaters are approximately 45cm long and are dark brown. They have a light pink coloured bill and white-flesh coloured legs and feet.

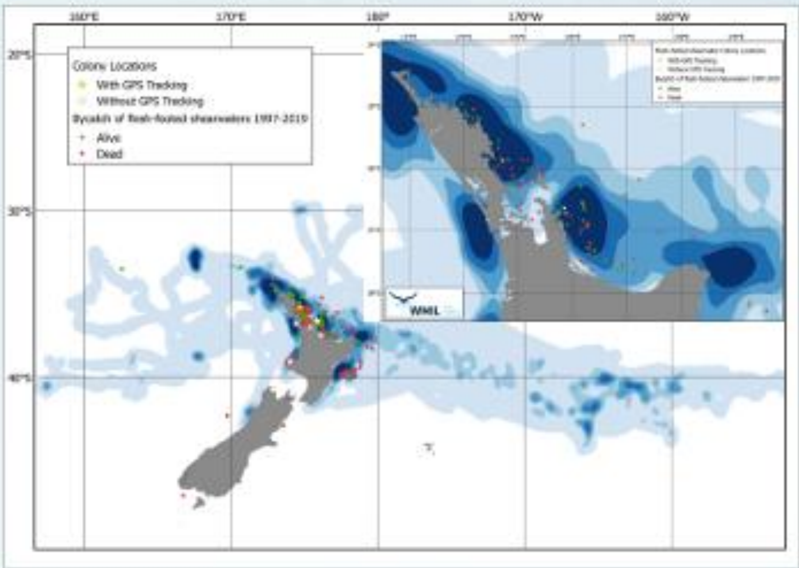
Distribution Map:

The distribution map shows where flesh-footed shearwaters are more likely to be found during the breeding season and where bycatch has occurred.

The dark blue areas indicate where numbers are most concentrated (hot spots) for foraging and feeding. These areas are also where most captures have been reported.

This data was accumulated from 1997 to 2019 breeding seasons.

It is not illegal to capture seabirds. IT IS ILLEGAL not to report captures of seabirds.

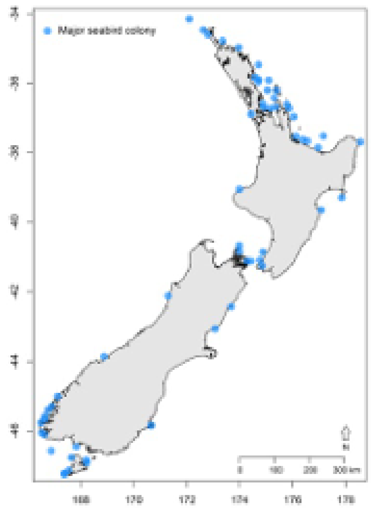


For more information on what to do when you have caught a bird, please refer to your Operational Procedures for Protected Species Risk Management document.

Appendix 4: Department of Conservation – Managing artificial lights to reduce seabird vessel strikes

Managing artificial lights to reduce seabird vessel strikes

Aotearoa New Zealand is the seabird capital of the world. Our seabirds are taonga (treasures) and our long coastline is dotted with their colonies. Unfortunately, many of our seabirds are threatened with extinction, so managing threats, including light pollution, is critical to their survival.



Why is light management important?

Many seabirds get disorientated by artificial lights at night, which can lead to collisions with vessels (vessel strikes). Following vessel strikes, seabirds can be contaminated with chemicals on deck (eg oil or fuel), causing loss of waterproofing and subsequent drowning. Vessel strikes can also cause direct seabird deaths. The risk of vessel strike is highest during foggy and rainy nights.

What can you do to help seabirds?

We recommend taking the following actions, while maintaining vessel and crew safety.

- Minimise light use, especially spotlights and floodlights, when you are within 5 km of an offshore island, where most seabird colonies are located.
- Avoid unnecessary movements and activities at night.
- Eliminate unnecessary lights.
- Shield lights to only light areas essential for safe operations.
- Use lights with reduced or filtered blue and violet wavelengths (eg 2200 K).
- Use black-out blinds wherever possible.
- Practice safe seabird handling and release techniques when vessel strikes occur (see diagrams below).
- Record and report vessel strikes.

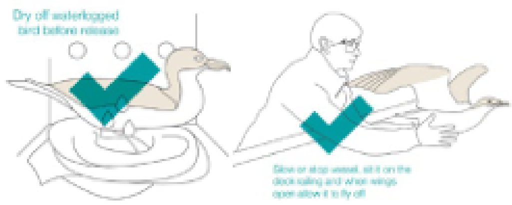
Commercial fishers

- Follow your Protected Species Risk Management Plan and operational procedures.
- Contact your liaison officer for more information.

Shearwaters and petrels (including diving petrels, storm petrels and prions) are particularly susceptible to vessel strikes. *Photos: Oscar Thomas*

Safe seabird handling techniques

Safe release techniques



For more information contact **marine@doc.govt.nz**

Department of Conservation *Te Papa Atawhai*

Te Kāwanatanga o Aotearoa New Zealand Government

Appendix 5: Template documentation to detail tools/equipment required to meet Mitigation Standards 1.1, 1.4, 1.5, and 1.7.

1.1 Lights not essential* for fishing operations and/or vessel safety are eliminated.

*Non-essential lights refer to lights that are not essential at a given time/place for a given task. Lights can be essential for one task and non-essential for another.

This Mitigation Standard is to be met by following these steps:

Step	Action	Vessel implementation
1.1.1	Remove completely non-essential lights (i.e., vanity lighting).	*List of lights removed:*
1.1.2	Fit lights with dimmers, motion-sensors, and/or timers.	*List of lights with dimmers, sensors, or timers:*

1.4 All essential lights are shielded, angled, and/or positioned to only light areas required for operations and safety and eliminate light spill.

This Mitigation Standard is to be met by following these steps:

Step	Action	Vessel implementation
1.5.1	Shield/angle/position essential lights to limit light to essential areas only.	*List of shielded/angled/repositioned lights:*

1.5 All essential lights use the lowest intensity as appropriate for operations and safety.

This Mitigation Standard is to be met by following these steps:

Step	Action	Vessel implementation
1.6.1	Replace lights to lower intensity as appropriate.**	*List of lights with lowered intensity:*

** Before adjusting navigational lights, contact a recognized surveyor or Maritime New Zealand.

1.7 All essential lights filter light spectra as appropriate for operations and safety.

This Mitigation Standard is to be met by following these steps:

Step	Action	Vessel implementation
1.7.1	Replace lights to adjust spectra as appropriate (e.g., filter blue/violet wavelengths, i.e., use amber lights).**	*List of lights with filtered spectra:*

** Before adjusting navigational lights, contact a recognized surveyor or Maritime New Zealand.

MINIMUM QUALIFICATIONS REQUIRED FOR THE VESSEL:

The vessel is to carry the following minimum crewing in **INSHORE & ENCLOSED LIMITS**:

MASTER	MATE	ENGINEER	OTHER	TOTAL COMPLEMENT
SRL< 3000GT	SRL<500GT	MEC 5	-	**3**

Appendix 6: Roles and Responsibilities of MBL Staff.

Table 5: Roles, responsibilities, and contact details relevant to the Extraction Management Plan.

Role	Responsibilities
Managing Director	Oversees the overall operations and strategy of the company.
Chief Operating Officer	Oversees and manages the day-to-day operations of the company, implementing the managing director's vision and strategies to ensure efficient and effective business processes.
Operations Manager	Responsible for the coordination and management of vessel operations, including managing crew and planning transit routes.
Compliance Manager	Manager for vessel and crew health and safety, including destination port and Maritime compliance Requirements
Environmental Manager	Environmental compliance and management, including consent and environmental monitoring and reporting.
Compliance Officer	Responsible for recording and reporting obligations related to vessel analytics, extraction amounts, and extraction tracks.
Master *William Fraser*	Responsible for the navigation and operation of the *William Fraser* at berth, transit, and while extracting.