



WASTE MANAGEMENT PLAN

Bass Strait Blue Economy Zone (BEZ),
Aquaculture Research Trial in
Commonwealth Waters

July 2024



Australian Government
Department of Industry,
Science and Resources

Cooperative Research
Centres Program

Document Control

DATE	REVISION	DESCIPRTION
1/07/2024	A	EPBC Referral submission

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1 INTRODUCTION

1.1 Background

The Blue Economy CRC (BECRC) is committed to a high environmental stewardship and operating responsibly, including in waste management. BECRC has partnered with industry to deliver and manage operational aspects of the Bass Strait Blue Economy Zone (BEZ) Aquaculture Research Trial in Commonwealth Waters (the Research Trial) and the Research Trial will be conducted in accordance with industry standard best practice environmental management systems and associated procedures.

This **Waste Management Plan** is written to support operations of the Research Trial. It covers waste derived from marine farming related infrastructure and operations, and fish wastes associated with animal husbandry.

BECRC has a legal responsibility to ensure that rubbish does not enter the marine environment and that other wastes are appropriately managed to mitigate potential environmental harm. This plan covers Research Trial marine activities and some aspects of shore-based waste management.

Rope and other materials leaving the aquaculture farms degrade the natural environment, have the potential to cause harm to wildlife, damage to vessels and impact the safety of other users of the waterways in which we operate.

Visual amenity of the coastline is an important aspect of aquaculture's social licence to operate. The build-up of marine debris from aquaculture farms has the potential to negatively affect relationships with local communities.

Fish wastes have the potential to reduce water and sediment quality, influence behaviours of some marine species, and can cause nuisance through odour.

Waste types considered in this plan include:

1. Rope
2. Feed pipe
3. Cigarette butts
4. Domestic waste
5. Netting off-cuts and end-of-life nets
6. Cardboard and paper
7. Used personal protective equipment (PPE)
8. Mortalities
9. Uneaten fish feed
10. Biofouling
11. Fish faeces, and
12. Metabolic by-products.

1.2 Objectives

1.2.1 Legislative requirements

The International Convention for the Prevention of Pollution from Ships (MARPOL) prohibits the disposal of any garbage or other pollutants to the marine environment, including but not limited to synthetic ropes, plastic garbage bags, cigarette filters, fibreglass, piping, floats and strapping band. Oil and oily mixtures are to be retained onboard for on shore disposal.

The *Litter Act 2007* states that a person must not deposit litter in a public place except in a receptacle that the owner or controller of the public place has provided for litter. BECRC is required to provide suitable receptacles for waste, which must be emptied frequently to allow for their proper use.

The *Environmental Management and Pollution Control Act 1994* states that the person who causes material environmental harm by polluting the environment is guilty of an offence. BECRC or an individual may be found to be the cause of environmental harm if they intentionally or recklessly dispose of waste to the water.

1.2.2 Objectives

The objectives of this plan are to:

- Target zero rubbish entering the marine environment
- Establish procedures and operating mechanisms that focus on:
 - Managing the loss of farm materials into the marine environment
 - Monitoring organic wastes in the surrounding environment
 - Managing retrieval and disposal of deceased fish
 - Managing biofouling
- Establish chains of responsibility at the farm level, and
- Establish monitoring procedures.

2 WASTE MANAGEMENT REQUIREMENTS

2.1 Rope

All vessels have appropriately sized secure containers/tubs with suitable lids to contain ropes. Lids are secured to avoid loss of material during transit.

“Vessels” means: runabouts, harvest and associated vessels, feed barges, bathe barges, work platform barges, net washers and other marine based vessels.

Where a suitably sized waste bin is not available, waste rope must be secured on a vessel to prevent loss to the marine environment. Material is then appropriately disposed of on shore as soon as practicably possible.

NOTE: This includes all aspects of on water marine operations.

2.2 On vessel

2.2.1 Bin management

It is everyone’s responsibility to ensure that bins on vessels are serviceable (in good repair and empty with appropriate lids in place).

1. Vessel skippers must check vessel bin status daily and indicate if action is required using the Daily Start-up Checklist for the relevant vessel. If required, the skipper is to ensure that the bin is emptied at a shore-based rubbish disposal facility before leaving the shore base.
2. The Fish Bathing Team Leader is to ensure that the bins on the bathing barge have enough room for the day’s transaction.
3. The Fish Bathing Team Leader is to ensure the bathing barge bin status is checked daily and indicate if action is required using the Daily Start-up Checklist for the relevant barge. If required, empty the bin at the feed barge or the shore base before the day’s work commences.
4. The Feed Team Leader (or delegate) is to ensure the barge is clean and bins are serviceable at beginning and end of each day.

2.2.2 Operational procedures when working on rigging

It is imperative that no untethered rope enters the water. Farm hands and works crew working on rigging and other off vessel activity must:

1. When accompanied by a vessel, dispose of rope off cuts straight to the vessel ensuring that all scrap rope ends up in the vessel's bin.
2. When unaccompanied by a vessel, rope off cuts to be held on person until vessel available for disposal.
3. Clear vessel deck of rope and off cuts by placing in vessel bin and securing the bin lid **before moving on.**

2.2.3 Storm events

When conducting pre and post storm checks, staff are to action potential marine debris issues (such as loose items).

2.2.4 Feed pipe maintenance

When unblocking, extending or replacing feedpipe, all off-cuts of feed pipe and rope are to be removed from the bundle and collected at the shore base for recycling. Off-cuts may need to be cut into manageable lengths in order to do this.

Particular attention to be paid to securing feed pipe fastenings (sleeves, screw caps).

Where possible, all pipe cutting must be completed on the vessel, or on shore, over a bag that can capture any shavings.

2.2.5 Cigarette butts

No cigarette butts to enter the marine environment. All butts to be disposed of in butt tins and rubbish bins provided on barges and vessels.

2.2.6 Domestic waste

All staff must ensure that their domestic waste (food wrappers, etc) is disposed of into secured vessel bins or appropriately disposed on land.

2.2.7 Netting off-cuts

Netting off-cuts may be generated by divers repairing subsurface netting, or by works crew repairing netting above the waterline.

Netting off-cuts are to be held on person until back on vessel, where netting off-cuts and twine are to be disposed of in the vessel's waste bin.

2.2.8 Cardboard and paper

All cardboard and paper generated on site (on shore or on the water) must be disposed of in a recycling bin.

All items delivered in boxes are to be removed from the box before the equipment leaves the shore base. The box is to be recycled.

2.2.9 Used PPE

Used PPE is to be disposed of in on shore bins, sorted into general waste and recycling as appropriate.

2.2.10 Hydrocarbons

All hydrocarbon waste (waste oil, oily water, oily rags, oil cartridges and used spill kit materials) are classified as a regulated waste. Hydrocarbon waste generated at the farm is bagged on-site and disposed of in designated bins at the shore base.

2.2.11 Black/ grey water

All black and grey water will be retained on board vessels and disposed of through the port's onshore facilities.

2.3 Wastes from fish husbandry

2.3.1 Mortalities

Fish pens are visually inspected daily, with any mortalities collected by a diver.

In the event of a mass mortality event, a harvest or works boat will be actioned to assist in the removal of mortalities from the water and delivery to a shore base.

All mortalities are loaded into 1 m³ bins with lids that are secured to prevent spillage. Mortalities are transferred from the vessel to a transport vehicle as soon as possible, and within 6 h of being removed from the water.

All mortalities (salmon and kingfish) are then transported by road using an appropriately authorised waste transporter to a rendering facility for processing in accordance with the site's permit.

Mortalities deemed unsuitable for rendering are either composted at an authorised composting facility or ensiled at Triabunna to be landspread at an authorised site.

As a last resort, mortalities will be sent to an authorised landfill for secure disposal.

2.3.2 Fish feed

When feeding salmon, there is a small amount of feed that is inevitably uneaten; this is estimated at 0.1% of total feed input. This feed is left to degrade naturally. Regular under pen and sediment monitoring is conducted to ensure that unacceptable impacts on the seabed do not occur. At the Trial Site, the active environment is expected to further reduce the amount of feed that settles to the sea floor.

In the unlikely event of a feed spill, the high energy environment of the Trial Site would quickly disperse the feed pellets, making collection unfeasible. Ongoing environmental monitoring results would be used to determine whether any impact from the spill had occurred.

Further details of sediment and water quality monitoring are provided in the BECRC Monitoring Program.

2.3.3 Biofouling

Fish pen nets are regularly cleaned to remove biofouling from seaweed, mussels and hydrozoans. Nets are cleaned frequently, every 10 to 14 days, to ensure low levels of biofouling.

Materials are removed from the nets using a specially designed remote operated vehicle (ROV). The organic material removed from the nets is not collected, and would be quickly dispersed into the surrounding waters at the high energy Trial Site.

2.3.4 Fish faeces

The generation of faeces is an inevitable consequence of growing fish. Excessive deposition of faeces on the sea floor can cause nutrient enrichment and the establishment of indicator species such as *Beggiatoa* and *Capitellia*. Faeces deposition at the Trial Site is expected to be minimal, as the high energy environment would quickly disperse and prevent the settling of wastes. Nevertheless, the environmental monitoring program would detect potential deposition and subsequent effects on the sediments beneath the pens.

Further details of sediment and water quality monitoring are provided in the BECRC Monitoring Program.

2.3.5 Metabolic by-products

Fish secrete ammonia as part of their metabolic processes. Although excessive ammonia (or other nutrients) in the water column can lead to eutrophication, the low stocking density and high energy environment of the Trial Site would suggest that the potential for nutrient enrichment is very low.

Potential impacts on water quality would be detected through the environmental monitoring program, as detailed in the BECRC Monitoring Program.

2.3.6 Liquid wastes

Bloodwater is generated on the harvest vessel through the process of harvesting fish. All bloodwater is disposed of on shore through composting or landspreading.

2.4 Shore based waste management

Shore bases are the main repository for all waste generated by marine farming activities.

A waste collection contractor will collect wastes from the shore base and dispose to an appropriate facility (recycler or landfill).

Where possible, significant sections of old feed pipe and other pipe and plastics are to be segregated for recycling.

Feed bags are to be bundled and sent for recycling.

All hire pallets are to be repaired where possible and returned to the supplier.

Scrap steel is to be recycled via a scrap metal recycler.

Rope and plastics are to be recycled where possible; if recycling is not available, it will be disposed to landfill.

3 MONITORING AND AUDITS

3.1 Shoreline clean up

3.1.1 Requirement

There are several triggers that may enact the need to conduct a clean-up, these include but are not limited to:

- Known high-level deposition area
- 3rd party information or request
- Staff, public or regulator observations, or
- Storm event

3.1.2 Equipment guidelines

There is a wide array of equipment that can be used to assist in shoreline clean ups depending on the type of debris and terrain of the shoreline. This includes but is not limited to:

- Safety footwear (must be worn at all times) – lace-up boots recommended
- Communication Equipment; handheld radio, phone, personal locator beacon (PLB)
- Gloves
- First aid kit – with instant cold pack and compression bandage
- Sunglasses/hat/sunscreen (as required)
- Food/water
- Back pack
- Garbage Bags (heavy duty preferred)
- Handheld GPS
- Suitable clothing for conditions (Hi-vis required)
- Lifejacket (must be worn at all times when working on the water)
- Inflatable boat or similar for staff drop off/pick up and marine debris recovery, and
- Knife or scissors.

3.1.3 General procedural considerations

- Plan area to clean up
- Check weather forecast and impacts for that location
- Verify planned route and duration with staff
- Check communication capabilities of area (radio/phone reception)
- Locate suitable area for staff to access shore, if required use waders or small vessel to disembark from transport vessel to shoreline
- Note the GPS coordinates of the start and end of the shoreline cleanup
- Walk along the shoreline between high and low tide marks where possible
- Collect all rubbish identified into garbage bags, when garbage bags full of too heavy (max 15kg) deposit above high tide mark and mark on GPS for collection at end of cleanup
- Any large/heavy items found to be marked on GPS for collection with additional staff or mechanical aid
- Obstacles encountered such as cliffs and land slips should be navigated around if impassable call for assistance and use a vessel to get around – do not attempt to climb cliff or pass over land slip.
- If dangerous wildlife is encountered staff should try to exit the area without any provocation to the wildlife. Other staff should be notified of the danger immediately. Follow incident and hazard reporting procedure if required on return to base at the end of the day.
- Once targeted area has been cleaned, staff to be picked up by transport vessel
- Full garbage bags and any large items located for collection using GPS data recorded during task
- Use waders or small vessel for collection of full garbage bags and large items
- Secure collected garbage bags and other marine debris on deck prior to departure
- Unload debris from the vessel at the shore base
- On a tarp, sort rubbish into 6 categories; Trial waste, Trial Rope, Other Fish Farming Rope, Other Fish Farming Waste, General Waste and Other Rope.
- Estimate volume and photograph all rubbish collected

- Identify the origin of Trial rope and equipment where possible
- Salvage any suitable equipment/rope for re-use
- Dispose of rubbish correctly
- Complete and submit a shoreline clean up report.

3.2 Deceased fish

The remote feed centre conducts daily mortalities checks as part of the daily start up routine. The employee will estimate the number of mortalities present in the pen, along with any observations about the pens or feeding equipment. This record is sent out daily to the Trial Site Manager and used to organise the mortality collection strategy.

Records are maintained of all mortalities collected, including their classification (refer to the Biosecurity Management Plan for additional information).

3.3 Sediment and Water Quality

Environmental monitoring requirements are described in the BECRC Regulated Monitoring Program.

3.4 Monitoring

Monitoring and evaluation will be undertaken to assess the efficacy of the Waste Management Plan. Monitoring will take the following forms:

- Annual farm audits
- Monitoring through scheduled shoreline cleanups
- Percentage of BECRC rope in shoreline cleanups will be assessed through shoreline cleanup forms, and
- Community Feedback – level of community feedback (complaints/praise) monitored by BECRC.

4 REPORTING AND RECORD KEEPING

4.1 Reporting

Outcomes of shoreline clean ups will be reported to the regulator as part of an Annual Environmental Report.

4.2 Record keeping

4.2.1 Shoreline clean up

Marine debris clean up results will be recorded in the Shoreline Cleanup App. The app is used to record:

- Location (GPS mark of start and finish)
- Distance
- Duration
- Number of staff
- Who undertook the activity
- Volume of waste collected

- Type of waste:
 - BECRC waste
 - BECRC rope
 - Other fish farm waste
 - Other fish farm rope
 - General waste
 - Other rope
- Comments

4.2.2 General Waste

All waste, including general and recycling are transferred to appropriate, authorised treatment facilities. Records of all waste leaving the site are collected from waste transporters monthly and entered into a waste tracker.

4.3 Mortalities

Records of all mortalities from the site are collected as part of the fish health management and for a waste tracking system. Monthly records are collected from both the waste transporters and the Triabunna rendering facility to understand the volume handled through each disposal pathway.

5 ROLES AND RESPONSIBILITIES

The Blue Economy CRC and its contracted industry partner are jointly responsible for implementing this Waste Management Plan.

The Principal Investigator BECRC is responsible for coordinating communications between the Research Trial Site Operations Lead and the relevant regulator (except where this Plan specifies direct and time-bound notifications).

BECRC has overall responsibility for waste management for the Bass Strait Aquaculture Research Trial.

The Research Trial Site Operations Lead is responsible for waste management actions associated with day-to-day operation of the Research Trial.

Vessel skippers, feed team leaders and bathing team leaders are responsible for daily vessel bin checks and emptying bins appropriately where required.

BECRC and the Research Trial Site Operations Leda are responsible for keeping associated paperwork in good order and suitable for external auditing.

The Research Trial Site Wildlife Officer is responsible for ongoing monitoring of farm sites. To be conducted in conjunction with wildlife monitoring duties.

All Trial Site staff are responsible for keeping solid waste farm materials and litter out of the marine environment.