

# WASTE MANAGEMENT PLAN

# Marine operations

TASSAL OPERATIONS PTY LTD  
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## Document Control

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# 1 INTRODUCTION

## 1.1 Background

Tassal Group Ltd (Tassal) is a Tasmanian-based Australian salmon farming company, founded in 1986. Its principal activities are the breeding, hatching, farming, processing, sales, and marketing of Atlantic salmon. Its wholly owned subsidiaries include Tassal Operations Pty Ltd and Aquatas Pty Ltd. Tassal is Australia's largest Atlantic salmon producer and employs over 1,700 people. Tassal is owned by Aquaculture Australia Company Pty Ltd and its ultimate holding company, Canadian-based Cooke Inc.

Tassal marine farming operations are conducted in five Marine Farming Development Zones across Tasmania. The Huon River and D'Entrecasteaux Channel, Storm Bay, Turrakana Tasman Peninsula and Norfolk Bay, Great Oyster Bay and Mercury Passage, and Macquarie Harbour. These operations are conducted in accordance with Marine Farming Licences and Environmental Licences, held by both Tassal Operations Pty Ltd and Aquatas Pty Ltd.

The purpose of this Waste Management Plan (the Plan) is to outline the process for management of waste, both controlled and general, at Tassal Tasmanian Marine Farming Operations (MOPs). The Plan is intended to satisfy the requirements of the Environmental Standards for Tasmanian Marine Finfish Farming 2023 (Environmental Standards) and condition WM1 of all Environmental Licences for Marine Farming leases held by Tassal Operations Pty Ltd and Aquatas Pty Ltd.

The Plan ensures all waste generated onsite is managed in compliance with regulatory requirements and in a manner that minimises the risk of environmental harm or nuisance. It applies to all Tassal staff and contractors operating within or supporting the MOPs. All waste produced onsite is to be managed in accordance with the Plan. There are supplementary internal procedures and task breakdowns which complement the Plan.

Various waste streams are produced across MOPs, as outlined in Section 2, with each requiring specific management approaches to ensure risks posed by the waste type are suitably controlled and the applicable regulatory requirements are met.

As per the Environmental Standards, the aim of The Plan is to minimise the potential environmental impacts of waste generated from finfish farming. Tassal's primary waste management objectives are:

- Manage waste in accordance with the waste management hierarchy – avoid/reduce, reuse/recycle, recover and dispose.
- Ensure that waste is stored and transported appropriately to prevent harm to the environment, the transfer of pathogens to the surrounding environment or nuisance to other users of the waterways.
- Ensure that waste is managed and disposed of in compliance with all regulatory requirements.

**Waste types** considered in the Plan include:

1. Feed waste
2. Medicated feed waste
3. Fish mortalities of varying severity.
4. Biofouling removed from vessels or infrastructure
5. Nets and farm infrastructure waste
6. Blackwater and greywater
7. Wastewater from harvest vessels
8. Fish bathing water
9. Effluent resulting from the operation of reverse osmosis plants
10. Vessel biosecurity washdown water containing disinfectant/chemicals
11. General waste

Further detail on these waste streams is provided in Section 2 of this document.

## 1.2 Legislative requirements

Refer to ENV-PLN-015 – Waste Management Plan for all legislative and regulatory documents that relate to this procedure.

The Plan has been structured to reflect the requirements of section 58 of the Environmental Standards for Tasmanian Marine Finfish Farming 2023 and condition WM1 of all Environmental Licences for marine farming leases held by Aquatas Pty Ltd and Tassal Operations Pty Ltd.

## 1.3 Definitions

<b>Blood Water</b>	Blood water refers to the waste product generated through harvesting with the <i>Emmanuel</i> , which is largely blood from the harvested fish. This is stored separately from fish and harvest water.
<b>Controlled Waste</b>	Controlled waste is a category of hazardous waste that includes wastes that exhibit toxicity, chemical or biological reactivity, environmental persistence, and/or the ability to bio-accumulate or enter the food chain. Some controlled wastes may not be strictly hazardous, i.e., tyres, but require special management and disposal methods.
<b>DEADF</b>	Controlled waste that is derived or arises from fish that have died or been killed in the course of finfish farming.
<b>Farming Infrastructure</b>	Any equipment that is used to facilitate farming operations (e.g. feed pipe, rope, nets, mooring equipment)
<b>General Waste</b>	Contains most non-hazardous, uncontrolled wastes that also cannot be categorised into one of the other categories. General waste also refers to waste that is produced through normal domestic activities i.e., cigarette butts, food packaging etc.
<b>Harvest Water</b>	Harvest water refers to water stored with harvested fish in the holds on both the <i>Emmanuel</i> and <i>Tassal 1</i> . This water is predominately salt water with a smaller percentage of blood from harvesting operations. All blood from the harvest operations on board the <i>Tassal 1</i> is captured and diluted within the harvest water.
<b>MOPs</b>	Tassal's Tasmanian based Marine Operations – this includes all Tassal vessels (used in Tasmania), leases and shore bases. This excludes any freshwater hatcheries or processing facilities.
<b>Recovered Material</b>	Any waste that was destined for landfill that has otherwise been diverted. It includes material that has been recycled, reprocessed or stockpiled for future use.
<b>Render</b>	A process that converts waste animal tissue into another product (e.g. meal & oil)
<b>Selector</b>	The apparatus on the feed barge that aims to distribute the feed to the different fish farm positions by selecting an outlet which is linked to that pen.
<b>Static Composting</b>	A method of composting where organic material is piled and decomposes without manual turning. This is an approved trial by the local council.
<b>Tassal</b>	Tassal Operations Pty Ltd and Aquatas Pty Ltd

<b>Tas Waste Register</b>	A live document that lists all waste streams across Tassal's Tasmanian Operations, with detail included regarding all approved disposal pathways.
<b>Unsecured Marine Farming Equipment</b>	Any infrastructure used to support MOPs that becomes unsecured and has the potential to enter the marine environment.
<b>Vessels</b>	Including bathing barges, dive vessels, feed barges, harvest and associated vessels, netwashers, runabouts, work platform barges, heavy works vessels, Well Boats and other MOPs based vessels.
<b>Waste Tracker</b>	A live tracking system that records key metrics for waste management across Tassal's operations, including volumes, transport logistic information, disposal pathways and associated costs.

## 1.4 Reference Documentation

DOC. ID	DOCUMENT NAME	PURPOSE
TWR	Tasmanian Waste Register	Live register that captures all current information regarding the management of waste streams across Tassal's Tasmanian operations. Appendix 1 provides an extract of the register and details the information captured.
ENV-PLN-015	Waste Management Plan	A whole-of-business plan that outlines the arrangements and obligations Tassal is committed to fulfilling to effectively manage waste disposal at all operational sites (Salmon, Prawn and Barramundi operations).
MO-130	Marine Operations Waste Management Plan	Currently exists as a marine operations plan. This will be separated so there will be one for each operational zone. This document will specifically outline management of both controlled and general waste for each operational area.
IMS-P1091	Marine Debris – Feed Pipe and Buoy Policy	A policy outlining the expectations around handling and usage of marine farming equipment to minimise the risk of marine debris.
MO-169	Harvest Vessel – Disinfection Protocol for Relocation between Farming Area	A task breakdown outlining how the harvest vessels are to be disinfected prior to relocation to other farming zones.
MO-156	Cleaning Harvest Vessel and Recirculation of Treated Water	A task breakdown detailing how the harvest vessel is cleaned and how subsequent wastewater is managed.

## 1.5 Training

Waste training is conducted in accordance with ENV-PLN-015 Waste Management Plan, which addresses waste management for the whole business, to ensure all relevant personnel are aware of disposal systems and legislative observations.

# 2 WASTE MANAGEMENT REQUIREMENTS

All waste is transferred to appropriate, authorised treatment facilities. Records of all waste leaving the site are collected from waste transporters monthly and are recorded in Tassal's waste tracker.

Waste registers have been developed for Tassal's operations across Australia. The Tassal Tasmanian Waste Register (Tas Waste Register) details each type of waste and approved transporters. This is a live document that is updated regularly to reflect current practices. An example of a waste stream is provided in Appendix A.

## 2.1 Feed waste

<b>Source</b>	<p>Feed waste is generated through two sources.</p> <ol style="list-style-type: none"> <li>1. Mixed or damaged feed.</li> <li>2. Uneaten feed deposited on the seafloor.</li> </ol> <p>Tassal has invested heavily to reduce the volume of both streams of feed waste.</p> <p>If there is surplus feed, this is reused elsewhere in the business or returned to the supplier. Accordingly, this material is not classified as waste.</p>
<b>Composition</b>	<p>Salmon feed is composed of a nutrient dense diet designed to optimise the performance of the fish. Ingredients are a combination of land and ocean-based proteins and lipids, grains and plant ingredients, and various other micronutrients. Due to the nutritional composition of the feed, excess feed wastage could result in nutrient enrichment of receiving environments.</p> <p>Mixed or damaged feed can be composed of any pellet size and diet composition. If feed is mixed or damaged whilst in the feed barge, it is removed from the barge and is emptied into bulk bags on board a heavy works vessel. This feed is stockpiled in 1,000 kg bulk bags until ready for disposal. If feed is damaged in storage, it remains within the bulk bags until ready for disposal.</p> <p>Uneaten feed waste is comprised of feed pellets of a size and composition that is suitable for the fish's life stage at that lease.</p>
<b>Quantity</b>	<p>Based on a 5 yearly average, there is approximately 30 t of mixed or damaged feed that is disposed of annually.</p> <p>This is estimated to be 0.0006% of total feed input.</p>
<b>Treatment and handling</b>	<p>There is no treatment of either feed waste stream prior to handling or disposal.</p>
<b>Environmental Controls</b>	<p><b>Location:</b> Mixed or damaged feed from Tassal's Eastern, Storm Bay, Channel and Southern operations is stored in 1,000 kg bulk bags at the Margate feed shed (30 Waterworth Drive, Margate). Mixed or damaged feed from Tassal's Western operation is stored in the feed shed at the Strahan Hub (160 Smiths Cove Road, Strahan). At both facilities, the mixed or damaged feed is clearly labelled and segregated from other feed.</p>

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**Containment Measures:** When pumping the mixed or damaged feed from the feed barge, a flexible hose is connected to the relevant selector. The alternate end of the hose is then placed in a bulk bag on the heavy works vessel, prior to pumping beginning. This is done with multiple staff present to reduce the risk of spillage. If any feed is spilt, it is contained to the deck of the vessel.

Feed stored in the shed is stored on concrete and is undercover.

**Spill Management:** Feed spills are contained to either the deck of the heavy works vessel or the concrete area at the respective feed shed. All spilt feed is shovelled into the bulk bag.

For uneaten feed waste that is deposited on the seafloor; where risk of environmental harm is considered negligible or low, it is left to degrade naturally.

If risk of environmental harm is present, spilt feed can be removed from the seafloor using an airlift system. The clean-up areas are checked (by ROV or Diver) at the conclusion of the clean up to ensure all feed is retrieved. Further management responses can also be implemented, including, relocation of fish to extend fallow duration. Feed infrastructure is also inspected to ensure spillage does not recur.

**Odour Management:** If mixed/damaged feed is waterlogged, there is a risk of the feed becoming rancid and generating odour. To mitigate this risk, water damaged feed is prioritised for disposal and is promptly removed from the storage facilities.

**Vermin Control:** All sites undergo regular pest control to reduce the incidence of vermin. Prompt removal of potentially odorous feed is also beneficial at reducing the risk of vermin interaction.

**Maximum Storage Volume and Duration:** Mixed/damaged feed is disposed of on an 'as needed' basis. Water damaged feed is prioritised, and storage time is minimised. Other mixed/damaged feed is relatively inert and the risk of turning rancid is low. As such, there is no set timeframe on disposal requirements.

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**Intended Destination and Relevant Authorisations**

If the mixed/damaged feed has not been to a farm site, it is returned to the supplier. If the mixed/damaged feed has been on a farm site, to comply with biosecurity requirements, this is disposed of via an authorised contractor. Feed is land spread on properties that hold the relevant approvals.

Refer to the Tas Waste Register.

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**Intentional Discharge (and associated monitoring of receiving environment)**

Feed is not intentionally discharged to the environment.

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**Record keeping**

Records of mixed/damaged feed transport (number of disposal trips only) is available through invoice records.

For uneaten feed, this is monitored through the Remote Operations Centre who manage feed distribution in association with fish feeding behaviour. This limits the volume of uneaten feed. It is not practicable to quantify uneaten feed; however, this is monitored during ROV surveys of the benthos.

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## 2.2 Medicated feed waste

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<b>Source</b>	<p>Medicated feed waste can be generated through three sources.</p> <ol style="list-style-type: none"><li>1. Surplus feed</li><li>2. Damaged or expired feed.</li><li>3. Uneaten feed deposited on the seafloor.</li></ol> <p>Tassal has invested heavily to reduce the volume of medicated feed waste.</p>
<b>Composition</b>	<p>The composition of the feed is the same as that detailed in Section 2.1. Additionally, medicated feed has the feed pellets coated with medication at the concentration prescribed by a veterinarian.</p> <p>Medicated feed waste is transported and stored in 1,000 kg bulk bags.</p>
<b>Quantity</b>	<p>Each treatment has a set volume of feed that is administered to the fish. During treatment events, the Veterinarian works closely with the Remote Operations Centre to minimise the risk of surplus feed being administered. Due to changes in fish behaviour during disease events and the strict regulations regarding the durations of medication treatments, only small volumes of medicated feed are utilised.</p>
<b>Treatment and handling</b>	<p>Medicated feed waste is considered a controlled waste under the Environmental Management and Pollution Control (Waste Management) Regulations 2020 and is managed accordingly.</p> <p>There is no treatment of medicated feed waste prior to handling nor disposal. Medicated feed is clearly labelled and segregated from other feed.</p>
<b>Environmental Controls</b>	<p><b>Location:</b> Medicated feed is stored in accordance with Section 2.1. Medicated feed waste is clearly labelled and segregated from other feed waste.</p> <p><b>Containment Measures:</b> Medicated feed waste is contained in accordance with Section 2.1.</p> <p>The risk of contamination to non-medicated feed in the barge and feeding infrastructure from medication residue is minimal. Upon the conclusion of a treatment, the silo onboard the barge is inspected and confirmed to be empty 1,000 kg of purge feed (feed that has passed through the manufacturing process to remove traces of medications residue) is fed to the medicated pens. Once the silo is emptied of the purge feed, equipment is cleaned prior to refilling the barge with non-medicated feed.</p> <p><b>Spill Management (incl management of clean up waste):</b> Feed spills are contained to either the deck of the heavy works vessel or the concrete area at the respective feed shed. All spilt feed is shovelled into the bulk bag.</p> <p>Uneaten feed waste is deposited on the seafloor. Where minimal pellets are on the seafloor, uneaten feed is left to degrade naturally. If risk of environmental harm is prevalent, uneaten feed can be removed from the seafloor using an airlift system. The areas of interest are checked (by ROV or Diver) at the conclusion of the clean up to ensure all feed waste is retrieved.</p> <p><b>Odour Management:</b> Medicated feed waste is managed in accordance with Section 2.1.</p> <p><b>Vermin Control:</b> Medicated feed waste is managed in accordance with Section 2.1.</p>

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	<b>Maximum Storage Volume and Duration:</b> Medicated feed waste is managed in accordance with Section 2.1.
<b>Intended Destination and Relevant Authorisations</b>	Refer to the Tas Waste Register. In accordance with the <i>Approved Management Method for Clinical and Related Waste</i> , landfills with the appropriate facilities (i.e. B or C Cell) will request approval (with the assistance of Tassal) from the EPA for specific disposal events of surplus medicated feed.
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	There is no intentional discharge of medicated feed. The Remote Operations Centre monitors feeding operations closely to minimise the risk of feed wastage. The seafloor and wild fish tissue concentrations are monitored under the Antibiotic Residue Monitoring Schedule, as required by the EPA. This is specific to each treatment event.
<b>Record keeping</b>	See Section 2.1.

## 2.3 Fish mortalities

Due to differences in management, fish mortality waste management has been separated into three sections:

1. Typical fish mortality
2. Elevated fish mortality
3. Mass fish mortality

There is substantial overlap between the three sections, however, all details have been provided in each section to ensure clarity.

The waste management hierarchy for mortalities treated with therapeutants is outlined in Appendix B.

**The General Manager – Salmon will ultimately determine the status of a mortality event in consultation with internal stakeholders and relevant operational data.** There are many variables that must be considered when determining the status of a mortality event. Table 1 is used as a guide when classifying mortality status. Note that not all criteria need to be met to change classification. The list of criteria is not exhaustive, and some mortality events may have other contributing factors.

Tassal ensures that all waste management pathways are suitably authorised and permitted to carry/store/receive the specific waste streams. Relevant authorisations from the EPA or local council must be held by the service provider.

The mortality level is primarily defined as the percentage of an operational zone's standing biomass being lost to mortality per day. This is further detailed in Table 1.

An acute incident is defined as a short-duration, abnormal event that results in an increase in mortality and is attributable to a discrete operational, environmental, or infrastructure-related stressor, rather than a progressive or chronic condition.

As per the Environmental Licences, the EPA will be notified via email of any mortality incident that affects (in an individual pen) more than 0.25 percent of fish per day for three consecutive days or more than 0.5 percent of fish on one day.

The EPA will be informed by Tassal when the mortality levels change classification.

**Table 1 - Mortality Status Classification Guide**

<b>Mortality Status</b>	<b>Primary classification criteria</b>	<b>On site Management</b>	<b>Waste Management</b>
<b>Typical</b>	Mortality of up to 0.50% of standing biomass (for zone) per day. A single pen experiencing mortality due to an acute incident.	Mortalities can be managed using existing resources that are assigned to the operational zone (i.e. one dive vessel).	Waste volumes remain within typical range and can be managed through day-to-day operational pathways (Triabunna Rendering and composting).
<b>Elevated</b>	Mortality of between 0.51% to 1.50% of standing biomass (for zone) per day. >1 to <10 pens experiencing elevated mortality associated with an acute incident.	Mortalities can be managed by redirecting resources <b>within the zone</b> or engaging contractors where internal resources are not available.	Waste volumes above typical range, however, can still be managed through day-to-day operational pathways with additional resources allocated (Triabunna Rendering, composting, static composting).
<b>Mass</b>	Mortality over 1.51% of standing biomass (for zone) per day.	Mortality management requires resources from <b>other areas within the business</b> (i.e. multiple additional retrieval vessels, divers). Contractors would also be engaged to assist on farm.	Waste volumes significantly above typical range and require management through additional contingency pathways (Triabunna Rendering, composting, static composting, ensilage and landspreading, landfill).

### 2.3.1 Typical Fish Mortality

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**Source** Salmon mortalities occur due to a variety of reasons, including, but not limited to, disease, genetic predisposition, environmental conditions, seal strike, trauma (e.g. from handling), jellyfish and algal blooms.

Typical fish mortality is defined in Table 1.

Mortalities are retrieved using either airlift systems, ROV retrieval or divers. Mortalities are classified upon retrieval based on suspected cause of death.

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**Composition** The fish are of all sizes and are at different stages of the decomposition process. Significant decomposition is typically considered to be the stage of active decay, where tissues are breaking down rapidly. Decomposition timelines are not consistent and vary significantly dependent upon influencing factors such as water temperature, fish size, cause of mortality, ocean energy, oxygen availability and biological factors.

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**Quantity** The quantity of mortalities generated by Tassal's marine sites varies greatly, both spatially and temporally. In 2024, Tassal harvested approximately 32,000T of Head-on Guttled Salmon. Tassal's Triabunna rendering facility processed approximately 5,000T of mortality during this time. As required by condition G8 (Finfish Mortalities) of the Environmental Licences, monthly mortality reports are submitted to the EPA with mortality figures.

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**Treatment and handling** Salmon mortalities are a controlled waste under the Environmental Management and Pollution Control (Waste Management) Regulations 2020 and are managed accordingly. Salmon mortalities fall within the waste code DEADF.

Mortalities are collected in fish bins. Each fish bin holds approximately 600 kg of mortalities. Fish bins containing mortalities are transferred from the vessels to the shore bases. The bin lids are secured. The bins have bungs in place to reduce the risk of leakage.

The bins are temporarily held at the relevant shore base, prior to collection by an approved DEADF transporter. The specific locations are listed below by Tassal operational zone (note these locations are the same for all levels of mortality).

- Southern Zone – Tassal's Hawkers wharf.
- Channel Zone – Tassal's Electrona wharf.
- Storm Bay Zone – Tassal's Nubeena wharf, on the historic net slab.
- Eastern Zone – Mortalities from MF55 Long Bay are stored temporarily at the Port Arthur shore base, prior to transport to the Nubeena wharf (as per Controlled Waste Transporter Certificate of Registration No. 11026). Mortalities from MF236 Okehampton are stored at Tassal's Triabunna wharf.
- Western Zone – Strahan Hub, in a refrigeration unit on site.

The duration of holding the fish bins is dependent on the location of the site (e.g. Macquarie Harbour operations are removed every 3-4 days, whereas on the East Coast, it is 1-2 days).

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Mortalities deemed unsuitable for rendering, can be typically temporarily stored at Tassal's Triabunna Rendering Facility, and are redirected to composting facilities that hold the appropriate permits. Any mortalities that have been treated with medication are held separately to untreated mortalities. These mortalities are taken to composting.

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**Environmental Controls**

**Location:** Mortalities are collected and stored in fish bins on the dive, ROV, or mort uplift vessel. Mort uplift vessels collect fish mortalities and deposit them directly to fish bins under the surveillance of trained personnel, to ensure the risk of discharge of organic matter is mitigated.

Once on shore, fish bins are placed in designated areas at each of the respective shore bases awaiting collection by an authorised transporter. These areas are not near neighbouring residents.

Fish bins from the Southern, Channel, Storm Bay and Eastern Zones are stored, unrefrigerated, in these areas prior to collection due to regular transporter availability.

Fish bins from the Western Zone may be responsibly stored for a short duration in a refrigerated container prior to collection.

**Containment Measures:** Fish pens are inspected routinely, and mortalities are removed as soon as practicable. During retrieval, fish are placed into fish bins. The fish bins have bungs in place to prevent leakage.

To minimise the risk of mortalities or associated material being released into the marine environment during pumping operations (such as airlifts or ROV retrievals), trained personnel are stationed on board to observe the system closely. If any discharge is detected, it is promptly cleaned up, and the retrieval process is adjusted to reduce the likelihood of recurrence.

To prevent discharge of mortalities from the salmon pens, each pen is emptied of mortalities frequently.

Once the bins are filled, they are fitted with weather and vermin proof lids that are fixed with zip ties or fitted elastic straps.

As the bins are only held temporarily, storage areas are not bunded, however are stored on site in an area that has a low risk of spillage (i.e. away from high traffic areas).

The bins are transported by approved waste transporters.

**Spill Management:** In the unlikely event of a spill of mortalities, all mortalities are retrieved. The area is cleaned and disinfected. If there was a spillage into the marine environment, divers would be used to retrieve any spilt mortalities. In the event of a spill, it would be reported to the EPA per incident reporting requirements.

**Odour Management:** Mortalities are retrieved from the pens as soon as possible to reduce the risk of significant decomposition. Fish bins are also removed from site as soon as possible to reduce the risk of odour nuisance.

**Vermin Control:** Pest control management strategies are in place at each site to reduce the risk of vermin interactions. This typically consists of monthly site visits from a pest control company who maintain bait stations across the sites. Bins are secured using zip ties or elastic straps and fitted with weatherproof/vermin proof covers to control the risk of vermin interactions.

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	<p><b>Maximum Storage Volume and Duration:</b> Each site is limited in the number of bins that can be handled, and this is determined by the capacity of the bin storage area. The duration storage on site is minimised to ensure environmental risks are managed and to provide for adequate cycling of bins between sites. Western zone bin collections occur once per week, with bins stored in a refrigerated area until collection. Sites across the East coast are collected on as 'as needed' basis that reflects mortality generation volumes. All frequencies can be increased as required.</p>
<b>Intended Destination and Relevant Authorisations</b>	<p>Refer to the Tas Waste Register.</p> <p>When the Triabunna Rendering Facility is not operating, or if the mortalities are not fit for rendering, mortalities are taken to a composting facility.</p>
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	<p>Not applicable. There is no intentional discharge of mortalities into the marine environment.</p>
<b>Record keeping</b>	<p>The remote feed centre conducts daily mortality checks as part of the daily start up routine to inform the daily collection strategy.</p> <p>Records are maintained of all mortalities collected, including their classification (grade of decomposition).</p> <p>Records of all mortalities from the site are collected as part of the fish health management, farm management, and waste management systems. Monthly records are collected from the waste transporters and the Triabunna rendering facility to understand the volumes handled throughout each disposal pathway. This information is reported monthly as per condition G8 (Finfish Mortalities) of the Environmental Licences.</p>

### 2.3.2 Elevated Fish Mortalities

<b>Source</b>	<p>Elevated mortality events typically arise due to pathogen outbreak or environmental stress.</p> <p>Elevated fish mortality is defined in Table 1.</p>
<b>Composition</b>	<p>See Section 2.3.1.</p>
<b>Quantity</b>	<p>As required by condition G8 (Finfish Mortalities) of the Environmental Licences, monthly mortality reports are submitted to the EPA with accurate quantities and disposal method proportions.</p>
<b>Treatment and handling</b>	<p>Elevated mortalities are handled on site in the same manner as described in Section 2.3.1.</p> <p>Resources from the site (staff and vessels) can be tasked with mortality retrieval, to support the existing removal resources. Contractors can also be hired to assist with removal.</p> <p>The fish bins are transported to the Triabunna Rendering Facility. If the Rendering Facility is unable to process mortalities, they are taken to a composting facility or static composting facility.</p>

	Any mortalities that have been treated with medication are held separately to untreated mortalities. These mortalities are managed through approved pathways as outlined in Appendix B.
<b>Environmental Controls</b>	<p><b>Location:</b> Fish bins are stored in the same location as outlined in Section 2.3.1. At present, skip bins are only used in the Southern Zone. The skip bins are held on a concrete slab.</p> <p><b>Containment Measures:</b> The containment measures are the same as those outlined in Section 2.3.1. Fish pens are inspected routinely, and mortalities are removed as soon as practicable. The skip bins are required to be water-tight and covered to prevent any leaks. Lids are sealed shut to reduce the likelihood of a spill occurring during transit.</p> <p><b>Spill Management:</b> Spills are managed in accordance with Section 2.3.1.</p> <p><b>Odour Management:</b> The risk of excess odour is controlled in accordance with Section 2.3.1.</p> <p><b>Vermin Control:</b> The risk of vermin is controlled in accordance with Section 2.3.1.</p> <p><b>Maximum Storage Volume and Duration:</b> The controls in Section 2.3.1 are abided by in elevated mortality events.</p>
<b>Intended Destination and Relevant Authorisations</b>	Refer to the Tas Waste Register.
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	Not applicable. There is no intentional discharge of mortalities into the marine environment.
<b>Record keeping</b>	See Section 2.3.1 for detail on record keeping.

### 2.3.3 Mass Fish Mortalities

<b>Source</b>	Mass mortality events typically arise due to pathogen outbreak or environmental stress. This is classified as per Table 1.
<b>Composition</b>	See Section 2.3.1.
<b>Quantity</b>	<p>Due to the high number of influencing variables, forecasting and quantifying mass mortality events is difficult. Each mortality event is unique and considered atypical. The quantity of mortalities varies greatly spatially and temporally.</p> <p>As required by condition G8 (Finfish Mortalities) of the Environmental Licences, monthly mortality reports are submitted to the EPA with accurate quantities and disposal method proportions.</p>
<b>Treatment and handling</b>	<p>Elevated or mass mortalities are handled on site in the same manner as described in Section 2.3.1.</p> <p>Additional vessels and staff can be contracted during mass mortality events to assist in prompt removal of mortalities. These contractors use the same previously described methods of mortality management.</p> <p>To increase fish bin availability across the business, skip bins can be utilised as an alternative. These skip bins are provided by an authorised</p>

transporter and stored in the same location as fish bins. Skip bins are required to be water-tight to prevent leakage. Mortalities are collected on the vessels in fish bins, then are tipped with a rotating forklift into the skip bin. This enables the quick reuse of fish bins on the vessels, while the skip bins are transported by an approved waste transporter to an approved waste facility.

The fish bins are then transported to the Triabunna Rendering Facility. Additional transporters can be arranged, if capacity of existing transporters is exceeded. If the Rendering Facility is unable to process mortalities, they are taken to a composting facility. If this facility is unable to accept the mortalities, they can be sent to a council approved static composting site, ensilage plant (for landspreading) or to landfill. Landfill is utilised only if no other option is available. Skip bins are transported directly to secondary disposal options (i.e., compost, static composting, ensilage landfill) due to operational constraints at the Triabunna Rendering Facility.

<b>Environmental Controls</b>	<p><b>Location:</b> Fish bins are stored in the same location as outlined in Section 2.3.1. At present, skip bins are only used in the Southern Zone. The skip bins are held on a concrete slab.</p> <p><b>Containment Measures:</b> The containment measures are the same as those outlined in Section 2.3.1. Fish pens are inspected routinely, and mortalities are removed as soon as practicable. The skip bins are required to be water-tight and covered to prevent any leaks. Lids are sealed shut to reduce the likelihood of a spill occurring during transit.</p> <p><b>Spill Management:</b> Spills are managed in accordance with Section 2.3.1.</p> <p><b>Odour Management:</b> The risk of excess odour is controlled in accordance with Section 2.3.1.</p> <p><b>Vermin Control:</b> The risk of vermin is controlled in accordance with Section 2.3.1.</p> <p><b>Maximum Storage Volume and Duration:</b> The controls in Section 2.3.1 are abided by in mass mortality events. Skip bins are removed daily.</p>
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<b>Intended Destination and Relevant Authorisations</b>	Refer to the Tas Waste Register.
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<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	Not applicable. There is no intentional discharge of mass mortalities into the marine environment.
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<b>Record keeping</b>	See Section 2.3.1. for detail on record keeping.
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## 2.4 Biofouling

<b>Source</b>	<p>Biofouling accumulates on the marine farming infrastructure (bioaccumulation). This includes, but is not limited to, mussels, seaweed, polyps and ascidians.</p> <p>Excess bioaccumulation causes excess strain on the infrastructure and, in severe cases, has the potential to impact fish health. As such, the biofouling is cleaned off at regular intervals.</p>
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<b>Composition</b>	This waste is composed of bioaccumulating species. There is no other waste product.
<b>Quantity</b>	The volume of biofouling is dependent on the nature of the lease. The cleaning methods do not enable accurate data collection regarding volume.
<b>Treatment and handling</b>	<p>The biofouling species either disperse into the water column or fall to the seafloor below the cleaning location. The biofouling is often broken up by the pressurised water, which promotes accelerated assimilation into the surrounding environment. This is considered to pose negligible risk of environmental harm or nuisance.</p> <p>The regularity of cleaning is dependent upon the type of equipment. The severity of bioaccumulation is dependent upon environmental factors (e.g. exposure, flow, season). Equipment is regularly checked by divers, the remote operations centre, and ROV, which informs the frequency of cleaning. Some common items and their ideal cleaning frequency are listed below.</p> <ul style="list-style-type: none"> <li>• Fish nets – cleaned fortnightly.</li> <li>• Barges – cleaned annually (or as needed).</li> <li>• Mooring ropes – cleaned annually (or as needed).</li> <li>• Collars – cleaned annually (or as needed).</li> </ul> <p>The biofouling is cleaned either using high pressure water jets (e.g. net cleaners or collar cleaning) or physical removal (e.g. stripping).</p> <p>Most biofouling removal is done with the equipment <i>in situ</i>, however, for larger preventative maintenance work, the equipment can be taken out of the water (i.e. to the Net Maintenance Facility in Strathblane). The Net Maintenance Facility is regulated by the Tasmanian EPA under Environmental Protection Notice No. 11051/1.</p>
<b>Environmental Controls</b>	<p><b>Location:</b> Most equipment cleaning is completed <i>in situ</i>. The organic detritus is most often deposited directly below the pen or dispersed into the water column. Biofouling debris is not observed in the out of lease compliance point annual video surveys, confirming that the detritus deposit is restricted to the footprint of the pens, within the lease boundary.</p> <p><b>Containment Measures:</b> Not applicable.</p> <p><b>Spill Management:</b> Not applicable.</p> <p><b>Odour Management:</b> Not applicable. All cleaning at the Net Maintenance Facility is completed in accordance with the relevant Environmental Protection Permit to reduce the risk of environmental nuisance.</p> <p><b>Vermin Control:</b> Not applicable.</p> <p><b>Maximum Storage Volume and Duration:</b> Not applicable.</p> <p><b>Noise Controls:</b> Due to the use of high-pressure water, cleaning operations can carry a noise nuisance risk. To manage this risk, cleaning operations are restricted to daylight hours at at-risk leases (i.e. close neighbours). Tassal also maintains a noise model which informs operational planning.</p>
<b>Intended Destination and Relevant Authorisations</b>	Not applicable.

<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	<p>The biofouling organisms are deposited to the seafloor or disperse into the water column. This is considered to pose minimal risk of environmental harm or nuisance.</p> <p>The annual video surveys (and internal surveys) observe the levels of biofouling debris present. All species (including invasive or pest species) observed in the video surveys are entered into the database that is submitted to the EPA.</p>
<b>Record keeping</b>	Cleaning date of equipment is recorded.

## 2.5 Redundant farm infrastructure

<b>Source</b>	<p>Due to the wear and tear on infrastructure deployed on the leases, equipment requires regular replacement. Further to this, as engineering and technology continue to develop, new equipment is often deployed on the leases, rendering old equipment redundant.</p> <p>Wherever possible and practical, this infrastructure is reused. Equipment is often cleaned and repaired at the Net Maintenance Facility and before being returned to the water. This is both an environmentally and economically sustainable way to manage equipment.</p>
<b>Composition</b>	<p>The redundant infrastructure can broadly be categorised into:</p> <ol style="list-style-type: none"> <li>1. Rope. This includes a wide variety of lengths, buoyancy, types, material, and diameter.</li> <li>2. Pipe.</li> <li>3. Collars.</li> <li>4. Stanchions.</li> <li>5. Bird nets.</li> <li>6. Fish nets. This includes a variety of material types and mesh sizes.</li> <li>7. Other exclusion nets and infrastructure. This includes seal fences, seal poles etc.</li> <li>8. Mooring equipment. This includes rope of various sizes, anchors and concrete blocks.</li> <li>9. Weights.</li> </ol> <p>Redundant infrastructure can have an accumulation of biofouling species. This biofouling is primarily on fish nets and is composed of mussels.</p>
<b>Quantity</b>	Volumes of other redundant farm infrastructure is highly variable and dynamic across sites.
<b>Treatment and handling</b>	<p>The net maintenance facility at Strathblane operates in accordance with the relevant Environment Protection Notice, as such, equipment at this facility has been excluded.</p> <p>Equipment destined for disposal from other sites is cleaned prior to storage or disposal. This is dependent on the type of equipment. This is either done actively (e.g. pressure washing nets) or passively (waiting for the biofouling organisms to die and fall off).</p> <p>Feed pipe is cut into shorter lengths (5-7 m), and stanchions have the metal cut out of them to facilitate recycling where possible.</p>
<b>Environmental Controls</b>	<b>Location:</b> There is no specific location for the storage of redundant farming equipment. As it is inert, there is negligible risk of

	<p>environmental harm or nuisance. Prior to disposal, redundant infrastructure is stockpiled to reduce the risk of safety incidents (e.g. trips, falls, fires, wildlife interactions).</p> <p><b>Containment Measures:</b> Not applicable.</p> <p><b>Spill Management:</b> Not applicable.</p> <p><b>Odour Management:</b> Equipment is stored away from both neighbours and staff meeting areas. Areas are kept tidy, with biofouling removed where possible.</p> <p><b>Vermin Control:</b> Pest control management strategies are in place at each site to reduce the risk of vermin interactions. For most sites, this consists of monthly site visits from a pest control company who maintain bait stations across the sites.</p> <p><b>Maximum Storage Volume and Duration:</b> Tassal aims to reuse and recycle equipment to the maximum extent that is practicable. Due to limited recycling options in Tasmania, most equipment is stockpiled. Avenues are constantly being investigated for the recycling of this infrastructure. As such, there is no set maximum storage volume or duration.</p>
<b>Intended Destination and Relevant Authorisations</b>	Refer to the Tas Waste Register.
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	This is not applicable. There is no intentional deposition of redundant farming infrastructure to the marine environment. Any unintentional discharge is covered by the relevant internal Marine Debris management procedures and is strictly regulated by Department of Natural Resources and Environment (NRE).
<b>Record keeping</b>	Volume and receiver of infrastructure sent for disposal or donation is recorded in a monthly waste tracker.

## 2.6 Blackwater and greywater

<b>Source</b>	<p>Black water and greywater are generated at the shore bases, on feed barges and the larger vessels that are fitted with bathroom facilities.</p> <p>This wastewater is stored in septic systems on the shore bases and in tanks on board the barges or vessels.</p>
<b>Composition</b>	The black water and grey water are generated through hand washing stations, showers, toilets and kitchen facilities.
<b>Quantity</b>	<p>Septic systems are emptied on a set frequency based on the requirements of each site.</p> <p>Vessels and barges are emptied out when required. The Ebenezer is the vessel that empties the barges on the East Coast of Tasmania. This vessel has a 2,000 L tank and is emptied approximately 4 times per week.</p> <p>The Aqua Spa and Aqua Tas both remove black and grey water once per month.</p>
<b>Treatment and handling</b>	On feed barges, all the grey and black water is stored in one tank. This is not treated. When approaching capacity, the Remote Operations

	<p>Centre is notified that it requires emptying. In response, when the barge is next due for a feed delivery, the Ebenezer vessel pumps out and removes any of the wastewater. For the barge in Western Zone, an authorised waste provider pumps the wastewater directly from the barge via an authorised pumping truck on board a heavy works vessel.</p> <p>On the larger vessels, there are holding facilities for the grey and wastewater. There is no treatment of the wastewater. These vessels are pumped out directly by an authorised service provider or are connected to shore base infrastructure so it can be discharged to the sewer.</p> <p>On the Aqua Spa and Aqua Tas, the wastewater is separated, with the liquid stream being treated with UV. Effluent solids are stored separately. Both streams are transferred to an approved waste transporter when the vessels are berthed at the wharf.</p> <p>Shore base black and grey water is collated in the septic tanks prior to disposal.</p>
<p><b>Environmental Controls</b></p>	<p><b>Location:</b> Septic tanks are at each site and are underground. The barges and vessels have the wastewater stored below deck.</p> <p><b>Containment Measures:</b> The tanks are well maintained and regularly inspected to reduce the risk of any containment breaches.</p> <p>When using the Ebenezer for blackwater transfers, the hose (one way valve) is fitted with cam locks on both ends to reduce the risk of spillage.</p> <p><b>Spill Management (incl management of clean up waste):</b> Any grey or blackwater spills on board vessels are contained to the bilges. In the unlikely event of a spill, an approved contractor would be arranged to pump out the bilge.</p> <p><b>Odour Management:</b> Septic systems on shore are well maintained and contained to prevent any excessive odour that would have the potential to cause nuisance to neighbouring properties or staff.</p> <p><b>Vermin Control:</b> All sites have regular pest control to reduce the incidence of vermin.</p> <p><b>Maximum Storage Volume and Duration:</b> The tanks (both on vessels and on shore) are emptied at the required frequency.</p>
<p><b>Intended Destination and Relevant Authorisations</b></p>	<p>The larger Tassal vessels discharge the wastewater into the holding tank on shore at the Margate Haywards Facility, where it is connected to the Tas Water operated sewage system.</p> <p>Both Well Boats unload grey and black water when alongside at Macquarie 4 Wharf. This is taken by approved contractors for disposal. Refer to Tassal Tas Waste Register.</p>
<p><b>Intentional Discharge (and associated monitoring of receiving environment)</b></p>	<p>There is no intentional discharge of black or grey water.</p>
<p><b>Record keeping</b></p>	<p>Volume of wastewater disposed of from septic systems is recorded in a monthly waste tracker.</p>

## 2.7 Wastewater from Harvest Vessels

<b>Source</b>	<p>Tassal generates two different streams of wastewater from harvest operations.</p> <p><b>Blood water:</b> The waste product generated through harvesting with the <i>Emmanuel</i>, which is largely blood from the harvested fish. This is stored separately from fish and holding water.</p> <p><b>Harvest water:</b> Harvest water refers to water stored with harvested fish in the holds on both the <i>Emmanuel</i> and <i>Tassal 1</i>. This water is predominately salt water with a smaller percentage of blood from harvesting operations.</p> <p>All blood from the harvest operations on board the <i>Tassal 1</i> is captured and diluted within the harvest water.</p> <p>As such, the <i>Emmanuel</i> generates both harvest and blood water. In contrast, the <i>Tassal 1</i> generates ONLY harvest water.</p> <p>Both waste streams are managed differently as outlined below.</p>
<b>Composition</b>	<p><b>Blood water:</b> Largely composed of salmon blood from the harvest operation. There is a proportion of salt water that is also in this stream.</p> <p><b>Harvest water:</b> Predominantly composed of salt water. This has a smaller concentration of blood and cleaning chemicals present. Water from harvest vessel washdown procedures is also encapsulated in the definition of harvest water.</p>
<b>Quantity</b>	<p><b>Blood water:</b> On average 1 ML per annum from all operations on the <i>Emmanuel</i>.</p> <p><b>Harvest water:</b> Volumes of harvest water are influenced by operational requirements, such as keeping fish from different leases separate and maintaining a balanced load in the vessel. On average 30-50 kL per week is produced during harvest operations at Okehampton and Macquarie Harbour. 86 ML per annum is generated through harvest operations across the marine farms in the Southeast.</p>
<b>Treatment and handling</b>	<p><b>Blood water:</b> After each day of harvest, the blood water is transferred to blood storage tanks at the Dover Processing Facility.</p> <p><b>Harvest water:</b> After each day of harvest, the harvest water is transferred off the harvest vessel. Okehampton and Macquarie Harbour have shore-based storage tanks. Cleaning water is dosed with sanitiser. Harvest water is dosed with the same chemical prior to transport to a treatment facility.</p> <p>Harvest operations conducted out of Dover release harvest water into the wastewater treatment plant balance tank for treatment prior to release. Cleaning water at southern operations is used multiple times (typically two to three times) due to the high concentration of chlorine and as a water saving measure. Once no or little chlorine is detectable in the water, it is disposed of into the wastewater treatment balance tank for treatment and disposal.</p>
<b>Environmental Controls</b>	<p><b>Location</b></p> <p><b>Blood water:</b> The blood water tanks at Dover are on a bunded concrete slab. These are away from high traffic areas.</p> <p><b>Harvest water:</b> The harvest water tanks at Okehampton (3x 20,000 L tanks) and Macquarie Harbour (3x 20,000 L tanks) are held alongside a shed at each site and bunded, ensuring they are out of the way.</p>

	<p><b>Containment Measures:</b> All holds in each harvesting vessels are monitored closely by on-board Engineers.</p> <p>All holds are emptied daily to reduce the risk of overflow.</p> <p>Both the blood water and harvest water tanks are within containment areas.</p> <p><b>Spill Management (incl management of clean up waste):</b> Any spills are cleaned up as best as practicable. The area is then disinfected.</p> <p><b>Odour Management:</b> Both blood and harvest water tanks are emptied frequently to reduce the development of excessive odour.</p> <p><b>Vermin Control:</b> All sites have regular pest control to reduce the incidence of vermin.</p> <p><b>Maximum Storage Volume and Duration:</b> The blood and harvest water tank levels are closely monitored to ensure they are emptied at an appropriate frequency.</p>
<b>Intended Destination and Relevant Authorisations</b>	Refer to the Tas Waste Register.
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	The only intentional discharge of blood or harvest water is when harvest water from Okehampton needs to be trucked to the Dover Processing Facility's Wastewater Treatment Plant (WWTP). This harvest water and that which is produced from southern harvest operations are passed through the WWTP prior to discharge to the marine environment. The water quality and potential impact on the receiving environment is managed and regulated in accordance with Dover Processing Permit.
<b>Record keeping</b>	Records of harvest water treated through the Dover wastewater treatment plant collected daily. Records are maintained for other disposal methods based on transport invoices.

## 2.8 Fish bathing water

<b>Source</b>	<p>Fish bathing water refers to water produced from bathing fish in fresh water to treat diseases such as Amoebic Gill Disease (AGD). Bathing is completed in two ways: Conventionally or via Well Boat.</p> <p>For Conventional bathing, a plastic liner is filled with freshwater from a storage facility (e.g., dam on Tassal property) and towed to the pen with the fish that require bathing. The freshwater is then transferred into another liner within the original fish pen. The fish are then pumped into freshwater and held for a set period (typically ~2 h). Once the bath is complete, the liner is released, and the freshwater diffuses to the immediate environment, and the fish are returned to the pen.</p> <p>In contrast, when using a Well Boat, the freshwater is either taken from an approved source or generated on board using a reverse osmosis (RO) system (into wells). The fish are transferred into the wells of the vessel, where they are held for approximately 2 hours. The fish are then returned to either the same pen, or into another pen (at the same or a different lease). This freshwater is reused before release to the marine environment.</p>
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<b>Composition</b>	In both Conventional and Well Boat bathing operations, there are no chemical additives used. There is no feeding during the bathing operation. Dependent on the water quality of the freshwater, and fish health requirements, oxygen is injected into the water to increase the dissolved oxygen (DO) concentration. As such, the released bathing water is, for all practical purposes, freshwater.
<b>Quantity</b>	<p><b>Conventional Bathing:</b> Up to 5 ML of freshwater is used for each bath. This is determined by the biomass of the pen being bathed.</p> <p><b>Well Boat Bathing:</b> Dependent on the size of the fish, the freshwater can be reused a number of times. Once the water is no longer of sufficient quality for bathing (in terms of salinity and ammonia levels), up to 5 ML is released.</p>
<b>Treatment and handling</b>	<p><b>Conventional Bathing:</b> The DO, CO<sub>2</sub> and salinity of the freshwater are monitored closely during the bathing process. The bathing water is oxygenated prior to and during the bath. The dissolved oxygen (DO) is held at a high level to ensure fish welfare. The water is not treated prior to release.</p> <p><b>Well Boat Bathing:</b> The ammonia, ammonium, salinity, pH, CO<sub>2</sub>, temperature and DO is monitored closely during the bathing process. The wells are oxygenated through the bathing process. Once this water is no longer appropriate for bathing, the water is released. There is no treatment of the bathing water prior to release.</p>
<b>Environmental Controls</b>	<p>The used bathing water does not have any further environmental controls to manage water quality. Due to the nature of the water and its use, it is considered to have negligible risk of environmental harm or nuisance on the receiving environment.</p> <p><b>Location:</b> The location of bathing water release is dependent on the operation and is always in undertaken in strict accordance with biosecurity protocols. If the bathing operation is being done on one lease, the water is released on the same lease. If the fish are being bathed during a transfer (i.e. moving from a smolt to a grow out lease), the bathing water can be released at the lease receiving the stock. Well boats do have the capacity to release 3nm offshore under exceptional circumstances where on-lease release poses a biosecurity risk (e.g. to prevent potential spread of disease from affected pens).</p> <p><b>Containment Measures:</b> Not applicable.</p> <p><b>Spill Management:</b> Not applicable.</p> <p><b>Odour Management:</b> Not applicable.</p> <p><b>Vermin Control:</b> Not applicable.</p> <p><b>Maximum Storage Volume and Duration:</b> Not applicable.</p>
<b>Intended Destination and Relevant Authorisations</b>	<p>As detailed above, both conventional and well boat bathing water is discharged into the marine environment. All discharge events are conducted in strict accordance with biosecurity protocols.</p> <p>Under unusual circumstances, the Well Boats are permitted to discharge the bathing water 3 NM offshore.</p>

<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	After bathing, bathing water is released to the receiving environment. No additional monitoring of the receiving environment is completed.
<b>Record keeping</b>	Bathing events are recorded as part of animal husbandry records and are available in FishTalk.

## 2.9 Reverse Osmosis effluent

<b>Source</b>	Reverse Osmosis (RO) effluent is generated through two sources at Tassal. Onshore RO systems, located at Port Arthur and Nubeena. Well Boat RO systems, located onboard the Aqua Spa and Aqua Tas.
<b>Composition</b>	The reverse osmosis wastewater from both sources is classified as hypersaline with a salinity between 57-65 ppt.
<b>Quantity</b>	When operational, the onshore RO systems can generate up to 1.5 ML of hypersaline wastewater each day. Well boat RO systems are used infrequently. When used, the hypersaline effluent discharged at a rate of 0.14 ML/h.
<b>Treatment and handling</b>	For the onshore systems, plume studies completed by Tassal indicate that the hypersaline wastewater dilutes rapidly and subsequently poses negligible risk of environmental harm or nuisance. As such, there is no treatment of the wastewater prior to discharge.
<b>Environmental Controls</b>	<b>Location:</b> The RO wastewater is discharged into the marine environment alongside the vessel, or at the outfall pipe for the onshore systems. The onshore system discharge pipes have multiple holes along the outfall pipe to encourage rapid diffusion into the environment. <b>Containment Measures:</b> Not applicable. <b>Spill Management:</b> Not applicable. <b>Odour Management:</b> Not applicable. <b>Vermin Control:</b> Not applicable. <b>Maximum Storage Volume and Duration:</b> RO wastewater is discharged at the time of generation. There is no storage of RO wastewater.
<b>Intended Destination and Relevant Authorisations</b>	RO wastewater is discharged directly to the marine environment.
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	RO wastewater is discharged to the receiving environment. Any monitoring required is completed in accordance with the applicable wastewater management plan as approved by the EPA.

<b>Record keeping</b>	<p>Volumes of hypersaline wastewater from onshore RO systems can be calculated, by considering the flow rate and the duration of discharge.</p> <p>Volumes of hypersaline water from the on-vessel RO systems is recorded in the respective vessel logbook.</p>
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## 2.10 Biosecurity washdown water

<b>Source</b>	<p>When transiting between biosecurity zones, or between at-risk leases (e.g. those with an active disease event), vessels are required to complete a disinfection cycle. Each site also has footbaths at various points to disinfect footwear.</p> <p>Both the Aqua Spa and the Aqua Tas undergo a thorough Stage 2 clean (14-16 h operation) when moving between year classes, biosecurity zones and high-risk areas. Stage 1 cleans are general cleans. Most operations require a stage 2 clean.</p>
<b>Composition</b>	<p>Biosecurity washdown water is predominantly seawater with traces of organic matter and freshwater with disinfectant. If generated by a well boat, or being used in a footbath, it may be primarily freshwater.</p>
<b>Quantity</b>	<p>Low volumes of disinfectant are used in vessel washdown on the leases. The disinfectant is delivered to site in concentrated form and diluted as needed. A very small volume of washdown water is generated from footbaths. Due to these small volumes, the biosecurity washdown water from the well boats will be the focus of this section.</p> <p>For both well boats, each Stage 2 clean generates up to 3.8 ML of washdown water. Stage 1 cleans generate some discharge of freshwater and disinfectant from the hose deck of the well boat.</p>
<b>Treatment and handling</b>	<p>To disinfect the well boats, the wells are filled with salt water, which is then disinfected and ozonated prior to discharge.</p>
<b>Environmental Controls</b>	<p><b>Location:</b> The well boats are either stationary or in transit while undergoing a Stage 2 clean. The washdown water is discharged at the end of the clean into the receiving marine environment.</p> <p><b>Containment Measures:</b> Not applicable.</p> <p><b>Spill Management:</b> Not applicable.</p> <p><b>Odour Management:</b> Not applicable.</p> <p><b>Vermin Control:</b> Not applicable.</p> <p><b>Maximum Storage Volume and Duration:</b> The maximum volume of washdown water from the well boats is 3.8 ML per Stage 2 clean. This is not stored on the vessel and is discharged at the end of the clean.</p>
<b>Intended Destination and Relevant Authorisations</b>	<p>The washdown water from the well boats is disinfected and ozonated prior to discharge.</p>
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	<p>All biosecurity wash water is discharged to the receiving environment. No monitoring is completed post-discharge events.</p>

<b>Record keeping</b>	Washdowns of Well Boats are recorded in the daily work plan, kept on board the vessel.
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## 2.11 General waste

<b>Source</b>	General waste is generated at the shore bases and from the on-lease activities.
<b>Composition</b>	Mixed general waste.
<b>Quantity</b>	Approximately 400 t per annum across marine operations.
<b>On-site treatment and handling</b>	General waste is placed into general waste bins. There is no further treatment of general waste on site. Feed bags are bailed and stored on site.
<b>Environmental Controls</b>	<p><b>Location:</b> General waste is collected in bins at various points around each shorebase. There is also a general waste bin on most vessels and barges. All bins on the shore bases are in areas where they are unlikely to be tipped over or damaged.</p> <p><b>Containment Measures:</b> All bins on the shore bases are kept with the lids closed or covered to prevent wind-driven loss. All bins on the vessels are secured and are fitted with secured lids to prevent loss of material during transit. Bin condition (remaining capacity and integrity of bin/lid) is checked daily. Where an appropriate waste bin is not accessible or practicable, waste is secured on the vessel to ensure loss to the marine environment does not occur.</p> <p><b>Spill Management:</b> Any general waste that is spilt is cleaned up as quickly as practicable. If the waste is spilt into the marine environment, reasonable efforts to retrieve the item (by diver or ROV) will be made.</p> <p><b>Odour Management:</b> To reduce the risk of odour, bins on vessels and on shore are emptied regularly.</p> <p><b>Vermin Control:</b> All sites have regular pest control to reduce the incidence of vermin. Prompt removal of potentially odorous general waste is also beneficial at reducing the risk of vermin interaction.</p> <p><b>Maximum Storage Volume and Duration:</b> General waste from the vessels is appropriately disposed of on shore as soon as practicably possible. Bins on shore are emptied by an authorised waste company at regular intervals, or more frequently, if required. Bailed feed bags are stockpiled. Tassal is investigating bulk-bag recycling options at a national scale.</p>
<b>Intended Destination and Relevant Authorisations</b>	Refer to the Tas Waste Register.
<b>Intentional Discharge (and associated monitoring of receiving environment)</b>	There is no intentional discharge to the receiving environment.
<b>Record keeping</b>	Refer to the Waste Tracker.

# APPENDIX A EXAMPLE OF TAS WASTE REGISTER

The below excerpt is taken from the Tassal Tasmanian Waste Register (Tas Waste Register). This details each type of waste and approved transporters. This is a live document that is updated regularly to reflect current practices. The below excerpt is in relation to mortality management across Tasmanian operations. This specifies the waste stream, controlled waste classification, and then proceeds to detail what contractors are used to transport this waste. The 'Disposal' and 'Disposal Method' columns then outline what disposal technique is utilised for each waste stream. Where applicable, the unique registration number, which confirms authorisation for transport of controlled waste, for each transporter is provided. Another portion of the Register is being developed to outline what waste streams different disposal facilities are authorised to receive.

WASTE	SITE	REGULATED?	WASTE CODE	CONTRACTOR	DISPOSAL	DISPOSAL METHOD	UNIQUE REGISTRATION NUMBER
Mortalities	Southern MOPs	Y	DEADF	Spectran	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7666
Mortalities	Southern MOPs	Y	DEADF	Veolia Environmental Management	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7516
Mortalities	Southern MOPs	Y	DEADF	Moore's Transport	Render/ Compost/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to	7290

WASTE	SITE	REGULATED?	WASTE CODE	CONTRACTOR	DISPOSAL	DISPOSAL METHOD	UNIQUE REGISTRATION NUMBER
						Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	
Mortalities	Southern MOPs	Y	DEADF	Walker's Transport	Render/ Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both mortars, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service.	8066
Mortalities	Southern MOPs	Y	DEADF	De Bruyn's Transport	Render/ Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both mortars, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service.	7544
Mortalities	Triabunna Render	Y	DEADF	Veolia Environmental Management	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both mortars, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7516
Mortalities	Triabunna Render	Y	DEADF	Spectran	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both mortars, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7666

WASTE	SITE	REGULATED?	WASTE CODE	CONTRACTOR	DISPOSAL	DISPOSAL METHOD	UNIQUE REGISTRATION NUMBER
Mortalities	Channel MOPs	Y	DEADF	Veolia Environmental Management	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7516
Mortalities	Channel MOPs	Y	DEADF	Spectran	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7666
Mortalities	Channel MOPs	Y	DEADF	De Bruyn's Transport	Render/ Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service.	7544
Mortalities	Channel MOPs	Y	DEADF	Moore's Transport	Render/ Compost/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost: Transport to be organised with a registered contractor.	7290
Mortalities	Channel MOPs	Y	DEADF	Walker's Transport	Render/ Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site.	8066

WASTE	SITE	REGULATED?	WASTE CODE	CONTRACTOR	DISPOSAL	DISPOSAL METHOD	UNIQUE REGISTRATION NUMBER
						2. For compost: Transported directly to Interlaken (Pure Living Soil) via service.	
Mortalities	Storm Bay MOPs	Y	DEADF	Veolia Environmental Management	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / shallow burial / other: Transport to be organised with a registered contractor.	7516
Mortalities	Storm Bay MOPs	Y	DEADF	De Bruyn's Transport	Render/ Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service.	7544
Mortalities	Storm Bay MOPs	Y	DEADF	Moore's Transport	Render/ Compost/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost: Transport to be organised with a registered contractor.	7290
Mortalities	Storm Bay MOPs	Y	DEADF	Spectran	Render/ Compost/ Ensilage/ Land Spread/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7666
Mortalities	Storm Bay MOPs	Y	DEADF	Walker's Transport	Render/ Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of	8066

WASTE	SITE	REGULATED?	WASTE CODE	CONTRACTOR	DISPOSAL	DISPOSAL METHOD	UNIQUE REGISTRATION NUMBER
						both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	
Mortalities	Eastern (+Port Arthur)	Y	DEADF	Moore's Transport	Render/ Compost/ Static Compost	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site. 2. For compost: Transported directly to Interlaken (Pure Living Soil) via service. 3. For static compost / other: Transport to be organised with a registered contractor.	7290
Mortalities	Eastern (+Port Arthur)	Y	DEADF	Walker's Transport	Render	1. For render: Site capacity on average 2.6 tonnes / hour (5 tonnes in summer of both morts, head frames, and gut). Keep in mind storage facilities on-site.	8066

# APPENDIX B WASTE MANAGEMENT HIERARCHY – MORTALITIES

