From:	[redacted]
To:	Tasmanian Salmon Study Secretariat
Cc:	"Adam Mechler"; "Richard Atkins"; "david"
Subject:	Submission to the Joint Study Leads - Tasmanian Salmon Industry
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Dr Wendy Craik AM
Dr Russell Reichelt AO
Joint Study Leads
Independent Study - Tasmanian Salmon Industry

Dear Joint Study Leads

I refer to my earlier email dated 20 June 2026.

Please find attached a Sweet Waters Pty Ltd submission prepared for the Joint Study Leads for their use and consideration in their Independent Study into the Tasmanian Salmon Industry.

Given the complexities of this matter and details contained within the Sweet Water Pty Ltd submission, we are happy to meet on a face-to-face basis to further elaborate and clarify any components that you may wish to further examine.

We look forward to the opportunity to working with the Joint Study Leads on such an important matter.

Best regards

David Kernke
Director
Sweet Waters Pty Ltd
Safeguarding our future
[redacted]
w: https://sweetwaters.com.au/

SWEET WATERS PTY LTD

Business Case

Addressing Antibiotic Contamination and Effluent Management in Tasmanian Salmon Aquaculture

A Proposal to the Joint Study Leads

Independent Study - Tasmanian Salmon Industry

Prepared by Sweet Waters Pty Ltd

July 2026

Attention:
Dr Wendy Craik AM
Dr Russell Reichelt AO
Joint Study Leads

Executive Summary

The Tasmanian salmon industry is facing an escalating antibiotic contamination crisis that threatens public health, the marine environment, Tasmania's wild fisheries, and the industry's own long-term commercial viability.

Between January and February 2026, two separate but related incidents have brought this crisis into sharp public focus:

- Huon Aquaculture administered oxytetracycline (OTC) at its Meadowbank flow-through hatchery on the River Derwent — a facility situated approximately 40 kilometres upstream from TasWater's Bryn Estyn water treatment plant, which supplies drinking water to much of Greater Hobart. The treatment took place without any public notification, and was only revealed through investigative journalism. No regulatory requirement existed to disclose it,

and TasWater has confirmed it does not routinely test Hobart's drinking water for antibiotic residues.

- In marine sea-cage operations south of Hobart, the antibiotic florfenicol was administered on an emergency basis in response to a mass disease outbreak that killed up to 15,000 tonnes of salmon. Testing by the Institute for Marine and Antarctic Studies found florfenicol residues in five native species — including rock lobster and abalone — at distances of up to 10.6 kilometres from the nearest salmon pen, more than three times the 3km public health exclusion zone. The federal regulator APVMA subsequently suspended use of florfenicol in Tasmanian waters from 2 March 2026.

These incidents reflect not isolated operational failures but a systemic gap: there is no treatment infrastructure to prevent antibiotic-contaminated effluent from entering Tasmanian waterways from either open sea-cage operations or flow-through river hatcheries, and the regulatory assumption that distance and dilution are sufficient safeguards is now demonstrably wrong.

Of particular concern is the risk that sustained florfenicol exposure in open marine environments will drive the spread of the floR resistance gene — the principal florfenicol resistance gene in aquaculture environments — through horizontal gene transfer across bacterial communities. International peer-reviewed research has documented exactly this pattern in Chilean and Japanese salmon aquaculture, with resistance genes persisting in marine sediments for extended periods and transferring to bacteria of human health significance. Tasmania now faces the same trajectory unless effective effluent treatment is implemented.

The official response — that antibiotic levels are safe because they are diluted, and that there is no specific testing for antibiotics in drinking water because risk is considered minimal — is not scientifically sufficient. At sub-lethal concentrations, antibiotics do not cease to drive resistance: they are most effective at generating it.

The Sweet Waters Solution

Sweet Waters Pty Ltd, a Tasmanian company founded by scientists and engineers with deep expertise in water and waste treatment, proposes a practical three-tiered solution applicable to both open sea-cage operations and flow-through river hatcheries:

For open sea-cage pens: A structured fine netting and vacuum collection system captures organic waste — faeces, uneaten feedstock, mortalities — from the seabed beneath each pen, transporting it via vacuum vessel to an onshore separation plant. The plant uses heat-induced maceration and aeration to separate the waste stream into recoverable fractions (oils and fats, organic biomass, and water). A sealed fermentation system with terminal pasteurisation then eliminates antibiotic residues and viable bacteria from the treated biomass — the only approach that actually destroys residues rather than dispersing them.

For flow-through river hatcheries: The effluent and sediment sludge from the hatchery is treated with the same system as above, where antibiotic residues — including OTC — are eliminated through the fermentation and pasteurisation process before any treated water is released. This directly addresses the public health risk to Hobart's drinking water catchment.

In both cases, treated waste streams are not simply disposed of: oils are recoverable as biodiesel feedstock, fermented biomass is a marketable agricultural fertiliser, and treated water — that even in case of fish pans is still lower in salinity than sea water — may be suitable for irrigation or safe discharge. Waste becomes a partially self-financing revenue stream.

The immediate next step is modest and low-risk: Sweet Waters proposes to deploy its Chief Technologist to conduct a site survey of a selected demonstration facility at approximately AUD

$2,000 per day (estimated 5–10 days), producing a detailed technical specification and cost estimate. Validation of the antibiotic removal process can be conducted at laboratory scale under guidance from Sweet Waters Director and Professor of Chemistry Dr Adam Mechler, at an estimated cost of AUD $200,000 over 6–12 months — a project well-suited to a government research contract given its direct public health relevance.

The Tasmanian salmon industry has a clear choice: continue to rely on dilution and distance as its only defences against antibiotic contamination, at increasing regulatory, commercial and reputational cost — or adopt a technically rigorous, publicly defensible treatment solution that positions the industry as a genuine environmental leader. The Sweet Waters system offers that path.

1. The Problem

1.1 Antibiotics in Hobart's Drinking Water Catchment

Huon Aquaculture operates the Meadowbank Hatchery as a flow-through facility on the bank of the River Derwent, approximately 20 kilometres upstream of New Norfolk and 40 kilometres upstream of TasWater's Bryn Estyn water treatment plant, which supplies drinking water to much of Greater Hobart. In a flow-through system, river water passes through the fish pens and all inputs — including antibiotics, disinfectants, hormones, and organic waste — are discharged back into the waterway.

Between 21 January and 9 February 2026, Huon administered oxytetracycline to salmon at the Meadowbank facility to treat an intestinal bacterial infection triggered by elevated water temperatures. Neither Huon nor the EPA publicly disclosed the treatment. Downstream users — including residents of Greater Hobart — were not notified. The treatment was revealed only after the Tasmanian Inquirer began asking questions; at that point it had already been underway for more than two weeks.

This was not the first time the Meadowbank Hatchery had drawn regulatory attention: the EPA issued a warning letter to Huon in May 2024 for a breach of a licence condition at the facility, the nature of which has not been publicly disclosed.

1.2 The Flor Gene: A Resistance Risk Written into the Marine Environment

The use of florfenicol in open marine salmon pens creates a risk that extends far beyond direct antibiotic residue levels in fish tissue. Peer-reviewed international research has documented that florfenicol exposure in aquaculture environments consistently drives the emergence and spread of the floR resistance gene — the primary florfenicol resistance mechanism — through horizontal gene transfer between bacterial species.

Key findings from the international scientific literature are unambiguous:

- Even at sub-lethal concentrations, florfenicol exposure increases the abundance of the floR gene in aquatic environments by orders of magnitude. Research has shown that as little as 0.1 mg/L of florfenicol in water can significantly elevate floR gene abundance within seven days.

- The floR gene spreads not only within bacterial populations but between them through horizontal gene transfer — meaning resistance acquired in aquaculture bacteria can be transferred to other bacterial species, including those of human health significance.
- Florfenicol can persist in seawater at sub-lethal concentrations for up to six months following treatment, and due to its low tendency to bind to sediment, remains mobile under the influence of currents — exactly the conditions now documented in Tasmanian waters.
- Research from Chilean salmon aquaculture — where the industry's antibiotic use has devastated wild fisheries — has identified floR gene variants in marine bacterial communities from salmon farm sites, with metagenomics demonstrating significantly higher abundance of antibiotic resistance genes at farm sites versus undisturbed reference sites.
- A single antibiotic can co-select for resistance to multiple drug classes. The floR gene has been found alongside resistance determinants for other clinically important antibiotic families, compounding the AMR risk.

The University of Queensland's antibiotic resistance expert Mark Blaskovich has confirmed that the florfenicol levels already detected in Tasmanian wild species are at concentrations "ideal for generating resistance." This is not a future theoretical risk — it is the current state of Tasmania's south-east marine environment.

The WHO classifies both oxytetracycline and florfenicol as highly important antimicrobials for human medicine. The AMA has publicly noted that between 1,000 and 2,500 deaths occur in Australian hospitals annually from resistant infections, and has called for greater transparency and stewardship in antibiotic use across all sectors including aquaculture.

1.3 Marine Operations: Contamination Already Beyond Safe Limits

The florfenicol crisis in Tasmania's marine operations has progressed from a disclosure failure to a documented contamination event with direct commercial consequences.

Following a mass mortality event that killed up to 15,000 tonnes of salmon between January and April 2025, the APVMA granted emergency approval in November 2025 for florfenicol use in salmon pens along the D'Entrecasteaux Channel. Within less than two weeks, approximately 700 kilograms of florfenicol had been administered — more than Norway's entire annual average of 500 kg — and the emergency permit authorised use of between 5,600 and 11,200 kilograms before August 2026.

Testing by the Institute for Marine and Antarctic Studies (IMAS) then found florfenicol residues in five native species — abalone, rock lobster, sea urchins, mussels, and periwinkles — at distances of up to 10.6 kilometres from the nearest salmon pen. Of 840 samples tested, 165 returned positive results. This finding is critical for two reasons: it demonstrates that the 3 km public health exclusion zone was wholly inadequate, and it directly threatens Tasmania's wild fisheries export markets, which operate under zero-tolerance rules for antibiotic residues. Rock lobster and abalone — two of Tasmania's most valuable export species — cannot legally go to international markets if antibiotic residues are detected.

Independent MP Peter George has warned that international buyers are already interrogating the industry about antibiotic contamination. The Chilean precedent — where the salmon industry's antibiotic use contributed to the destruction of wild fisheries and the collapse of coastal ecosystems — is now being explicitly cited by Tasmanian environmental groups and parliamentarians. The APVMA suspended florfenicol use in Tasmanian waters from 2 March 2026, but Tassal continues to treat fish at several of its leases.

1.4 Why Dilution Is Not a Sufficient Safeguard

The official response to public concern about antibiotic contamination has rested primarily on the argument that dilution over distance renders residues harmless. This argument fails on four distinct grounds:

1. Dilution has been empirically disproved. The 3 km exclusion zone was based on assumptions about dilution. Florfenicol was subsequently detected at 10.6 km — more than three times that distance. The model was wrong.

2. No one is actually testing Hobart's drinking water for antibiotics. TasWater has confirmed it does not specifically test for antibiotic residues because it considers risk minimal. This is an assumption, not a measurement. Standard water treatment processes — coagulation, filtration, chlorination — were designed for pathogens and sediment. There is no published evidence that they reliably remove oxytetracycline or florfenicol from drinking water.

3. Sub-lethal concentrations actively drive resistance. The AMR risk is not reduced by dilution — it may be enhanced by it. Antibiotic resistance selection is most effective at sub-lethal concentrations; high concentrations kill bacteria, while low concentrations select for resistant strains. The very conditions produced by dilution are optimal for AMR generation.

4. The floR gene, once established, persists and spreads. Resistance genes established in environmental bacterial communities under antibiotic selection pressure do not disappear when treatment ends. They persist in sediments, transfer horizontally to new species, and accumulate over successive treatment cycles. The question is not whether the current treatment cycle poses a risk — it is what the cumulative effect of multiple treatment cycles will be on Tasmania's marine microbiome and ultimately on human health.

2. The Opportunity

The regulatory and public pressure now bearing on the Tasmanian salmon industry is intense, but it also creates a genuine strategic opening for the industry to take a leadership position that is commercially, politically, and reputationally valuable.

The Tasmanian government has already identified the transition of flow-through hatcheries to recirculating systems as a priority in its Salmon Industry Plan 2023. The EPA has introduced new antibiotic reporting requirements across all 19 freshwater hatcheries. The APVMA has suspended florfenicol use. These steps indicate the regulatory direction. The industry's choice is whether to be dragged toward it, or to get ahead of it.

An industry that voluntarily adopts rigorous effluent and antibiotic treatment infrastructure now can expect to:

- Shape, rather than resist, the emerging regulatory framework — industry-led solutions consistently result in better commercial terms than regulatory mandates
- Protect access to premium export markets with zero-tolerance antibiotic standards — markets already asking questions will respond positively to credible treatment solutions
- Qualify for government co-investment and potentially favourable tax treatment of environmental management expenditure under natural capital accounting frameworks
- Rebuild social licence with a Tasmanian community that is justifiably concerned — transparent, independently verified environmental performance is the only credible response

- Avoid the Chilean outcome, where uncontrolled antibiotic use contributed to the collapse of wild fisheries and ultimately threatened the salmon industry itself

The AMA, the Greens, independent parliamentarians including Meg Webb and Peter George, environmental organisations, and public health authorities are all now publicly engaged on this issue. A credible industry-led solution changes the political dynamic from adversarial to collaborative.

3. The Sweet Waters Solution

Sweet Waters Pty Ltd is a Tasmanian company founded by a multidisciplinary team of scientists, engineers, and business operators with demonstrated expertise in water and waste treatment. The company's philosophy is grounded in green chemistry: minimum energy, minimum environmental footprint, and the recovery of commercial value from waste streams.

The proposed solution is a three-tiered system applicable to both open sea-cage marine operations and flow-through freshwater hatcheries. Both operation types share the same treatment infrastructure.

Tier 1a: Collection — Open Sea-Cage Pens

The waste material that causes the primary environmental damage in and around sea-cage pens is relatively dense and chunky: it consists principally of fish faeces, coagulated uneaten feedstock, and fish mortalities. This material sinks to the seabed, where it accumulates and degrades. Fine colloidal particles, by contrast, remain suspended in the water column and are dispersed and diluted by tidal flows. The Sweet Waters collection system is designed specifically to target the dense settled fraction, which is both the most tractable to collect and the primary driver of seabed degradation and antibiotic accumulation in sediments.

The system works as a series of passive funnels. A structured fine netting system covers the entire floor area of each pen, connected to the existing side netting and sloped toward a series of small concrete collection chambers positioned at the low points. Each chamber serves a defined catchment area of the net. The key design elements are:

- Passive concentration by gravity and tidal action: the netting acts as a series of funnel-shaped collectors. As tidal flows shake and agitate the net, this mechanical action breaks up larger pieces of waste and assists movement of the settled material down the slope toward the collection chambers. No power source is required for collection; the system uses the existing energy of the tidal environment.
- Concrete collection chambers at the seabed: each chamber acts as the sump of its funnel, passively concentrating settled slurry from a defined area of the net. Chambers are connected to a network of pipes that join progressively into larger connecting pipes rising to surface access points on a barge or buoy. No pumping infrastructure is required at depth.
- Vacuum collection vessel: a purpose-equipped vessel — operating on the same principle as a liquid waste truck emptying a septic tank — connects to the surface access points and uses high-capacity suction to draw the concentrated slurry from the chambers through the pipe network and into its onboard tank. The vessel then transports the collected slurry to the onshore treatment facility.

A key design question — to be resolved through the R&D phase — is the optimal netting mesh size, geometry, and slope angle. The mesh must be fine enough to catch the target waste fraction while remaining sufficiently open to be kept clean by tidal agitation and not impede water flow. The number of collection chambers per pen, the pipe network configuration, and the optimal catchment area per chamber also require experimental determination. These are tractable engineering questions with established analogues in other industries; the R&D phase is designed to answer them in the specific conditions of Tasmanian sea-cage operations.

Tier 1b: Interception — Flow-Through River Hatcheries

For flow-through hatcheries, the collection challenge is different: effluent is already leaving the facility in a liquid stream that re-enters the waterway. The solution is interception of that discharge stream at the outflow point — before it reaches the river — and directing it to the onshore treatment facility.

This approach directly addresses the Meadowbank scenario: antibiotic-bearing discharge water is captured, treated, and its antibiotic residues destroyed before any treated water is released to the Derwent. The treated water may then be suitable for agricultural irrigation or, if necessary, simple low-cost post-treatment before release.

Tier 2: Onshore Separation and Treatment

Collected material from both sea-cage and hatchery operations is processed through an engineered onshore facility. Using heat-induced maceration and aeration, the waste stream is separated into three principal fractions:

- Fats, oils, and greases (FOG) — separated and prepared for commercial valorisation
- Organic matrix / fermented biomass — separated for valorisation as agricultural fertiliser
- Water fraction — treated for reuse or release

A standard facility consists of six 20–50 tonne engineered separation tanks, associated piping, two holding tanks for water and oils, a receiving port for vacuum vessel offloading, and standard power and hot water utilities. The facility is designed to be operated by a two-person crew. Critically, a single onshore plant can service multiple farm sites and hatchery operations, substantially reducing the per-site capital cost.

The system is designed to avoid energy-intensive centrifugation, instead exploiting gravity and thermal processes — keeping both capital and operating costs low.

Tier 3: Biological Elimination of Antibiotic Residues

This is the critical component that distinguishes the Sweet Waters approach from simple effluent management: the actual destruction of antibiotic residues from the treated waste stream. This directly addresses the floR gene risk, the drinking water contamination risk, and the export market contamination risk simultaneously.

Sweet Waters proposes a sealed anaerobic fermentation system for metabolic degradation of antibiotic compounds. Fermentation is the most energy-efficient pathway for antibiotic breakdown. The process is managed with rigorous biosafety controls:

- Sealed system: the fermentation process is fully contained; no release of antibiotic residues, resistant organisms, or resistance genes during processing

- Terminal pasteurisation: at the completion of each batch, the entire contents are subjected to pasteurising conditions (following food-industry standard practice) to eliminate all viable bacteria — including any that may have acquired resistance during the process — before the treated product is removed from the system

The result is a treated biomass that is substantially free of antibiotic residues and free of viable antibiotic-resistant organisms. This is not the dispersal of residues through dilution — it is their destruction.

The efficiency parameters of the antibiotic removal process will be validated through laboratory-scale research under the leadership of Sweet Waters Director and Professor of Chemistry Dr Adam Mechler. Given the direct relevance to the EPA's new freshwater monitoring requirements and the APVMA's suspension of florfenicol, this work is well-suited to a government research contract or grant.

4. Waste Valorisation — Turning Liability into Revenue

A distinctive feature of the Sweet Waters approach is that treated waste streams are not simply disposed of — they are designed to carry genuine commercial value, partially offsetting the capital and operating cost of the system:

- Fats, oils, and greases: the FOG fraction has an established market as feedstock for biodiesel production
- Fermented biomass: the treated organic matrix is a potent agricultural fertiliser suitable for resale
- Treated water: suitable for agricultural irrigation directly or after simple low-cost post-treatment, or safe for discharge

This valorisation model aligns with circular economy and natural capital accounting principles increasingly embedded in government sustainability policy, and provides a partial commercial return on what is currently a pure environmental liability.

5. Costs and Commercial Considerations

5.1 Site Scoping — Immediate First Step

It is not possible to provide firm capital cost estimates without a site-specific assessment. The configuration of the collection system, the volume of effluent to be treated, the distance between farm sites and a shared onshore plant, and the physical characteristics of hatchery discharge points all affect cost significantly.

Sweet Waters proposes to deploy its Chief Technologist, Max Huni, to conduct a survey of a selected demonstration site. This will produce a detailed technical specification, site-specific engineering design, and a firm cost estimate. The consulting engagement is estimated at approximately AUD $2,000 per day for an estimated 5–10 days — a very modest outlay relative to the decisions it will inform, and considerably below standard industry consulting rates.

5.2 Indicative Capital Costs

Based on comparable installations and equipment costs, Sweet Waters estimates a capital cost range of AUD $2–5 million for a pilot system — with a substantially reduced (<1 million) per pen cost when a single onshore plant services multiple pens and hatcheries. The principal capital items are: collection netting, concrete collection chambers and vacuum pipe network, vacuum collection vessel, and onshore separation plant.

5.3 R&D: Antibiotic Residue Validation

Validation of the antibiotic removal process at laboratory scale is estimated at AUD $200,000, covering personnel, overheads, and equipment over a 6–12 month timeline. This work directly addresses the EPA's new monitoring framework and APVMA's concerns about florfenicol in the marine environment. It is well-suited to a government research contract or grant.

5.4 Ongoing Operating Costs

Operating costs are modest: principally a two-person plant crew, vessel fuel, and standard utilities. Revenue from valorised waste streams — biodiesel feedstock, agricultural fertiliser, and potentially irrigation-grade water — will partially offset these costs. Specific revenue projections are volume-dependent and will be developed during the site scoping phase.

5.5 The Cost of Inaction

Any commercial assessment of this proposal must be weighed against the alternative. The APVMA has already suspended florfenicol use. Wild fisheries zones near Bruny Island have been closed. International buyers are interrogating the industry about contamination. The EPA has imposed new reporting requirements. The trajectory is clear — and the cost of regulatory mandates, export market exclusions, legal liability for environmental harm, and the reputational consequences of a Chilean-style outcome are all materially greater than the cost of proactive investment now.

6. Natural Capital Accounting Framework

Sweet Waters recommends that the industry's adoption of this technology be framed within a natural capital accounting (NCA) approach — an internationally recognised, UN-endorsed framework that makes the environmental costs and benefits of business activity measurable and reportable alongside financial accounts.

Under NCA, the environmental and public health impacts of salmon farm operations — antibiotic discharge, nutrient loading, seabed degradation, and AMR risk — are quantified as liabilities. Investments made to reduce or offset those impacts are recognised as capital. This creates a principled basis for:

- Demonstrating measurable environmental and public health improvement to regulators, certification bodies, and the community
- Making the case for government co-investment and for tax treatment of environmental management expenditure as capital investment
- Supporting sustainability certification and premium market positioning
- Aligning with the UN System of Environmental-Economic Accounting (SEEA) and Australia's national environmental accounting initiatives

NCA does not create new costs. It makes existing costs visible — and creates the conditions for those costs to be properly valued, incentivised, and shared between industry and government as a shared public good.

7. Stakeholder Engagement Strategy

State Government and EPA: The proposal should be presented within the government's Salmon Industry Plan 2023 framework and specifically in the context of the EPA's new freshwater antibiotic monitoring requirements and the APVMA's florfenicol suspension. The case for co-investment in both the site scoping and the La Trobe R&D is compelling on public health grounds alone.

Public Health Authorities and AMA: The antibiotic residue elimination component directly addresses the AMR risk identified by the WHO and the specific public health concerns raised by the Meadowbank incident and the florfenicol findings. The AMA is already publicly engaged on this issue; engagement through existing contacts can generate professional endorsement and strengthen the policy case for government investment.

Minister for Climate Change and Sustainability: Framing the initiative within climate, circular economy, and natural capital accounting principles creates alignment with the priorities of the minister responsible for environmental and sustainability policy, and supports the case for tax incentives for environmental infrastructure investment.

Legislative Council and Cross-bench: Members including Meg Webb, who has described the current regulatory situation as 'shockingly inadequate,' and independent MP Peter George, who has warned about export market consequences, have both called for action. A credible industry-led technical solution addresses their stated concerns and changes the political dynamic from adversarial to constructive.

Wild Fisheries and Commercial Fishers: The detection of florfenicol in lobster and abalone has directly threatened the commercial viability of wild fisheries operators. This group has a strong shared interest in the adoption of treatment infrastructure that prevents further contamination of wild species.

Community and Environmental Groups: Transparent, publicly reported progress against independently verified environmental targets is essential to rebuilding community trust after the Meadowbank disclosure failure and the marine contamination findings.

8. Next Steps and Indicative Costs

- **Site scoping and technical specification** — Sweet Waters Chief Technologist Max Huni conducts an on-site survey of the selected demonstration facility (covering both a sea-cage pen and a flow-through hatchery), assessing net configuration options, collection chamber placement, pipe network routing, vacuum vessel access, onshore plant location, and effluent volumes. The survey produces a detailed technical specification and firm capital cost estimate. It is not possible to provide accurate costings without this step. **Estimated cost: ~AUD $2,000/day, estimated 5–10 days (~$10,000–$20,000 total).** This is a very modest

outlay relative to the capital investment decisions it will inform, and is well below standard industry consulting rates.

- **R&D: antibiotic residue removal validation** — Laboratory-scale validation of the fermentation-based antibiotic removal process, conducted under the leadership of Sweet Waters Director Professor Adam Mechler. The study will quantify removal efficiency for both oxytetracycline and florfenicol, characterise the microbiological safety of the terminal pasteurisation step, and produce data suitable for regulatory submission. This work directly addresses the EPA's new freshwater monitoring requirements and the APVMA's concerns about florfenicol in the marine environment, and is well-suited to a government research contract or grant. **Estimated cost: AUD $200,000 (personnel, overheads, and equipment). Timeline: 6–12 months.**
- **Government engagement** — Present the proposal to the relevant state ministers, seeking in-principle support and co-investment discussion within the Salmon Industry Plan 2023 framework
- **AMA and public health engagement** — Brief Tasmania's Director of Public Health and the AMA on the AMR and floR gene risks, and the proposed technical solution
- **Collection system optimisation and pilot installation** — Following site scoping, a pilot installation at the demonstration sea-cage pen will allow experimental determination of the optimal netting mesh size, slope geometry, and catchment area per collection chamber. The pipe network will be tested and configured for efficient and even suction across all chambers, establishing the correct number of chambers per pen and surface access points required. Concurrently, the hatchery effluent interception system will be commissioned and tested. Independent monitoring of antibiotic residue elimination performance will be conducted throughout. **Capital cost estimate: AUD $2–5 million for pilot plant (reducing substantially when a single onshore plant services multiple pens and hatcheries). Firm costs subject to site scoping.**
- **Waste stream valorisation assessment** — During the pilot phase, the three treated waste streams will be characterised and their commercial value assessed: the fats, oils, and greases fraction for biodiesel feedstock markets; the fermented biomass as an agricultural fertiliser product; and the water fraction for salinity testing to determine suitability for irrigation or safe discharge. Revenue projections for each stream will be developed and incorporated into the operational cost model. **Ongoing costs: minimal — principally a two-person plant crew, vessel fuel, and utilities. Partially offset by waste stream revenues.**
- **Government and stakeholder engagement** — Present the proposal to the relevant state ministers within the Salmon Industry Plan 2023 framework, brief the AMA and Tasmania's Director of Public Health on the AMR and floR gene risks, and engage cross-bench parliamentarians. Seek in-principle government co-investment in the site scoping and R&D phases. **No direct cost to industry for engagement phase.**
- **Annual public reporting** — Commit to independent annual reporting of antibiotic use, residue outcomes, and environmental performance against natural capital accounting metrics, with results published publicly.

9. Cost Summary

Site scoping (Max Huni, 5–10 days on site): AUD $10,000–$20,000

R&D — antibiotic removal validation (La Trobe University, government contract): AUD $200,000 over 6–12 months

Pilot capital installation: AUD $2–5 million per pen (substantially reduced per-site with shared onshore plant across multiple pens and hatcheries)

Ongoing operations: minimal — two-person crew, vessel fuel, and utilities. Partially offset by recovered waste stream revenues (biodiesel feedstock, agricultural fertiliser, treated water).

Note: Firm capital cost estimates can only be developed following an on-site scoping survey. The site scoping engagement is the essential and low-cost first step that makes all subsequent investment decisions possible.

10. About Sweet Waters Pty Ltd

Sweet Waters Pty Ltd is a Tasmanian company dedicated to delivering cost-effective water treatment solutions grounded in green chemistry. The company's directors combine scientific depth with commercial and operational experience, and share a common commitment to protecting Tasmania's water resources from industrial degradation.

Richard Atkins — Director: Legal background and extensive corporate expertise in strategic planning, financial management, and stakeholder engagement, including in the Quick Service Restaurant and innovation industries.

Max Huni — Engineer & Inventor: Chief Technologist with a career focused on aqueous waste treatment and water resource management, including practical treatment installations at Shene Distillery and Argus Recycling in Dandenong South.

Dr Adam Mechler — Director & Scientist: Professor of Chemistry at La Trobe University with over 150 peer-reviewed publications in the physical chemistry of particulate organic suspensions and aqueous systems. His scientific expertise directly underpins both the separation technology and the antibiotic residue elimination process. Has ongoing research into green bioinspired anti-microbial compounds and anti-biofouling solutions.

David Kernke — Director: Practical operational expertise in sustainable industrial waste management and a background as founding owner of DTZ Australia Queensland, National Director at CBRE Australia, and member of the CBRE Global Risk Committee. Active in Tasmanian heritage conservation.

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