Submission to the Environment and Communications References Committee

Inquiry into the regulation of the finfish aquaculture industry in Tasmania, with particular regard to:

f. Any other relevant matters

Submitted by: Biofouling Solutions Pty Ltd, Kingston, Tasmania

Background to this submission

Biofouling in the marine context can be described as the unwanted growth of marine organisms on any submerged surface. The biofouling community can comprise of a range of plants and animals from microscopic slime through to complex multi-species, multi-dimensional communities. Aquaculture sites are areas of intensive production, with leftover fish food and faeces providing a large volume of organic material as a food source for biofouling organisms. The complex array of infrastructure associated with finfish aquaculture including nets, cages, ropes, floats, boats and barges, provides and supports ideal substrates for a wide diversity of biofouling. High levels of biofouling can lead to increased hydrodynamic drag, reduced buoyancy, poor flow and low dissolved oxygen, resulting in increased cleaning and maintenance costs. Depending on their composition, biofouling communities can also harbour disease, toxins, Invasive Marine Species (IMS), cause irritation and lesions in salmon, and deleteriously affect the caging and associated infrastructure.

As a consequence, the finfish aquaculture industry has adopted routine in-water cleaning operations to manage biofouling. However, such in-water cleaning activities may be inadvertently impacting fish health and the wider environment. For example, such cleaning activities could assist in propagating the abundance and artificial dispersal of problematic biofouling species, including IMS. The uncertainties and associated risks accompanying current in-water cleaning practices highlights the need for a critical assessment of these practices, and a robust, independent review of the biosecurity system requirements across the state of Tasmania. This submission represents the opinion of Biofouling Solutions Pty Ltd (BFS) and seeks to highlight the vulnerabilities of the Tasmanian finfish industry to biofouling organisms and IMS, and the potential risks to the wider marine environment, as a result of current biofouling management practices.

BFS concerns regarding current Tasmanian finfish industry in-water net cleaning operations

The industry has taken significant steps towards contributing to the restoration of the health of Tasmanian waterways by phasing out the use of copper-based antifouling agents on their nets. However, since replacement nets now lack toxic antifouling compounds, they accumulate unwanted biofouling which requires frequent in-water cleaning. The Tasmanian Salmonid Growers Association (TSGA) has produced guidelines which outline the procedures considered by representatives of the salmon farming industry and other professional bodies as being ‘best’ for the environment in terms of net wash ‘waste’ or ‘pollution’ – namely the ‘Environmental Best Management Practice Guidelines for In situ Net Cleaning of Salmon Cages Using

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Marine Inspector Cleaner (MIC)' (also referred to as the EBMP Guideline). However, the move away from copper-based nets and the adoption of the EBMP Guideline leaves the Tasmanian finfish industry more vulnerable to a host of other, unanticipated issues. Of particular concern is the risk that in-water net cleaning can facilitate the spread and proliferation of dislodged viable biofouling organisms to the wider environment, and even the spread of IMS. This is not considered at all in the EBMP guidelines. The spread of IMS is particularly serious since international experience shows that IMS can adversely affect and/or shut down aquaculture operations and have significant environmental impacts. If an IMS were to be inadvertently spread from finfish aquaculture infrastructure to the surrounding environment, this could lead to a situation where an entire bay is quarantined, the industry put in lock down, and by association the reputation of lease holders severely compromised. In addition, depending on the type of IMS being spread, the impacts on Tasmania's native marine flora and fauna, and other marine industries, could be substantial. In short, significant potential risk exists to the Tasmanian finfish industry, its corporate interests/reputation and the Tasmanian marine environment from existing net cleaning practices.

BFS recommendations to the Senate Committee

Complaints made against Tassal Group Ltd (Tassal) by mussel and abalone farmers about the impact of finfish farming on their industries and Tasmania's marine environment have prompted Tassal to engage the independent expert opinion of BFS. In particular, Tassal seek pragmatic management measures to help manage these marine biosecurity issues and help prevent the risk of environmental, reputational and financial damage. BFS will determine short and long term research priorities for Tassal to address these issues through the design and implementation of a complete marine Biosecurity and Biofouling Management Plan. However, given the connectivity within and between farming regions, it is imperative that other finfish producers follow this lead. BFS strongly suggest that the Senate Committee consider the following recommendations as part of a wider management plan for biofouling related issues throughout the Tasmanian finfish aquaculture industry:

1) ***Develop an overarching Biosecurity Management Plan (BMP)***

The Tasmanian State Government currently lacks adequate, active marine quarantine controls to prevent the introduction of novel IMS into state waters. As such, the Tasmanian finfish industry as a whole is extremely vulnerable to the introduction of IMS. Development of a BMP would involve undertaking a detailed vector analysis to determine all the likely pathways for the introduction of IMS into Tasmania's aquaculture Industry, the potential 'reservoir effect' of farm surfaces, and the ways in which IMS could be spread within and between farming regions. The output will identify high risk pathways for IMS introduction and establishment, and develop measures for how these pathways could be managed to an 'Acceptable Level of Protection'.

2) ***Conduct an appraisal of current in-water net cleaning operations***

It is vital to assess present in-water net cleaning operations across the state to determine if such practices are propagating the dispersal of various biofouling and potential IMS. Depending on the type of biofouling organism and/or their reproductive state at the time of net cleaning, current practices could facilitate their spread and recolonization (e.g. fragmentation of colonies or by encouraging mass larval release). The appraisal would involve a comprehensive assessment of the viability and fate of net washing material during and after in-water cleaning operations. The assessment would integrate understanding of spatial and temporal

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biofouling variability and the spatial differences in existing net cleaning machinery and cleaning protocols amongst regions.

Significant potential risks currently exist for in-water cleaning operations where biofouling remnants and propagules are not routinely collected during net-cleaning. Improved protocols may require collection of biofouling material removed from nets. BFS does not underestimate the impacts that such a paradigm shift would have on the industry as the costs associated with collecting all defouled material from in-water cleaning operations are likely to be substantial. However, investment into such methods may be critical in protecting the wider environment and allow the industry to continue farming operations if an IMS was to establish within the industry.

3) ***Establish the nature and extent of biofouling and IMS already present on finfish industry infrastructure***

Biofouling communities can have significant economic and environmental impacts in aquaculture. A critical first step towards the development of a BMP is therefore in understanding the spatial and temporal distribution of biofouling species in the finfish growing regions, the density of species and what IMS may be already present and require urgent management. Undertaking this fundamental assessment underpins future understanding of the effects of in-water cleaning.

4) ***Conduct IMS surveillance and monitoring***

An effective BMP also involves active surveillance and monitoring to detect newly arrived and potentially problematic species. Once the BMP has identified high risk pathways and IMS, an education programme can be implemented to educate industry employees (e.g. production/farm managers, net cleaner operators, etc) about IMS to increase the likelihood of identifying potential pathways or newly established IMS. For example, this could involve in-house training sessions and the production of site specific biofouling guides to allow employees to readily and confidently identify key IMS of concern.

BFS expertise and experience in marine biofouling and IMS issues

Biofouling Solutions was established in 2008 in Kingston, Tasmania by experienced research scientists who specialise in the effective management of marine biofouling organisms and IMS. Our services cover a broad range of professional, scientific and technical aspects of biofouling and IMS management. Our scientists (who together have over 60 years' combined experience researching and managing biofouling and IMS) operate in Australia and overseas to assess and mitigate the threat of IMS incursions via biofouling. We provide national and international clients with a complete range of solutions for biofouling and IMS related issues, and a comprehensive biofouling and IMS management service from advice in the project design phase to management planning, risk assessment, task specific training, inspection/verification and auditing. We develop, test and implement a wide range of biofouling treatments and management regimes that can be applied to any maritime vessels or infrastructure, including recreational vessels, commercial vessels, non-trading vessels, oil and gas vessels/infrastructure, shellfish and finfish aquaculture installations, wharves and

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marinas. Areas of specific strength include practical scientific research aimed at environmental, regulatory and industrial biofouling management applications including antifouling and in-water cleaning technologies.

Concluding remarks

Currently, the Tasmanian finfish aquaculture industry is highly vulnerable to the risk of IMS and heavy biofouling outbreaks. The uncertainties and associated risks with current biofouling and IMS management practices highlights the need for a critical assessment of risks associated with net cleaning and a robust, independent review of the biosecurity system requirements across the state of Tasmania. The BFS recommendations outlined here encompass a multi-tiered approach to address current and future vulnerabilities from marine biosecurity issues. This approach would provide the Tasmanian finfish aquaculture industry with a greater ability and confidence to manage biofouling, thereby providing certainty in the continuity and sustainability of their operations. Effective management of marine biosecurity and biofouling will ultimately enable the industry to proceed with confidence and greater control over interrupted production, adverse environmental impacts, and media, public or government scrutiny in this area of their operations. Effective marine biosecurity risk management ultimately underpins the longevity of the Tasmanian finfish industry.

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