

DRAFT STATEMENT OF REASONS FOR DETERMINATION MADE PURSUANT TO MANAGEMENT CONTROLS 3.0.1 and 3.3.5 THE MACQUARIE HARBOUR MARINE FARM DEVELOPMENT PLAN OCTOBER 2005.

I, Wes Ford, Director, Environment Protection Authority, acting under delegation of the Secretary of the Department of Primary Industries, Parks, Water and Environment, provide this statement of reasons for my determination, pursuant to Management Control 3.0.1 and 3.3.5 of the *Macquarie Harbour Marine Farming Development Plan October 2005*, (the Plan), regarding the determination of the maximum permissible biomass within the period 1 June 2017 and 31 May 2018 for licenced finfish marine farming operations within all the areas covered by this plan.

I further provide this statement of reasons for my determination pursuant to Management Control 3.0.1 and 3.3.5 of the plan for the apportionment of biomass between the leaseholders licenced for finfish marine farming operations within all the areas covered by this plan.

Determination under Management Control 3.0.1 and 3.3.5

1. *The maximum permissible biomass for salmonids held in cages **without approved waste collection systems** for the total area of the leases operated by the companies is 13.0 tonnes per hectare for the period 1 June 2017 to 31 May 2018.*
2. *The maximum permissible **additional** biomass for 2016 year class salmonids held in cages **with approved waste collection systems** installed is an additional 15.0 tonnes per hectare for the 2016 year class only.*
3. *The maximum permissible number of 2017 year class smolt is not to exceed the quantity of fish (allowing for normal mortality) that would achieve a biomass for the year class of 13.4 tonnes per hectare in the period 1 December 2018 to 31 January 2019. (Based on the assumption that a total biomass of 12,000 tonnes in December 2018 is made up of 90% 2017 year class fish and 10% 2018 year class fish, and with 805.89 hectares available the total biomass will be in the order of 14.9 tonnes per hectare).*
4. *The calculation of the smolt for the companies is to be based on the lease area available for stocking and authorised to grow fish at 1 August 2017.*

Background

Marine farming in Macquarie Harbour occurs under the provisions of the *MARINE FARMING PLANNING ACT 1995* (MFPA) and the *LIVING MARINE RESOURCES MANAGEMENT ACT 1995* (LMRMA).

The MFPA *inter alia*, provides for the preparation of draft marine farming development plans. A draft marine farming development plan prescribes areas where marine farming may occur, the specific area of State Waters that may be the subject of a marine farming lease and the types of marine farming that may occur within a marine farming lease area.

The MFPA provides for the Minister to approve a draft marine farming development plan which must contain Management Controls to satisfactorily manage and mitigate negative effects.

On 29 June 2016, the Minister for Primary Industries and Water and the Secretary delegated their powers (as they relate to environmental management) under the MFPA, and LMRMA to the Director, Environment Protection Authority.

The purpose and objectives of the MFPA are outlined at Section 4. Section 4(1)(b) states:

(1) the purpose of the Act is to achieve well-planned sustainable development of marine farming activities having regard to the need to;

(b) minimise any adverse impact of marine farming activities

Section 4(2) of the MFPA states:

(2) A person must perform any function or exercise any power under this Act in a manner which furthers the objectives of resource management.

“Objectives of resource management” means the objectives set out in Schedule 1 to the MFPA- see section 3 of the Act.

The Plan was approved by the Minister on 18 August 2006. Amendment No. 2 to the Plan was approved by the Minister on 28 May 2012. The marine farm operators are required to undertake regular benthic monitoring in Macquarie Harbour as part of the condition of the Marine Farming Licence granted by the Minister. The timing of the monitoring requirements is varied by a direction issued by the Secretary (or Director, as delegate) under management control 3.01 of the Plan.

Whole of Harbour Biomass determination

Findings on question of fact

In making my decision, I made the following findings of fact:

1. Benthic indicator monitoring is a meaningful way to assess the environmental impact of marine farming in Macquarie Harbour.
2. There has been a significant deterioration in the level of compliance with benthic indicators monitored through regulatory video survey monitoring for the periods May 2016, September 2016 and January 2017.
3. September 2016 benthic surveys assessed 90 “35 metre” compliance sites across nine Macquarie Harbour marine farm lease areas. Twenty-one percent of compliance sites (nineteen sites) across four lease areas were non-compliant with *Beggiatoa*.
4. January 2017 benthic surveys assessed 105 compliance sites across 10 Macquarie Harbour marine farm lease areas. Thirty-six percent of compliance sites (38 sites) across six lease areas were non-compliant with *Beggiatoa*.
5. One lease (213), first stocked in September 2016, was assessed as having 3 non-compliant sites by the January 2017 benthic surveys.
6. Between the September 2016 and January 2017 benthic surveys one site improved compliance (133) and 3 remained at zero non-compliances (217, 216 & 220).
7. Additional monitoring undertaken by Tassal and Petuna during February and March 2017 shows a contraction in the extent of the *Beggiatoa*. This may be confirmed by the benthic compliance surveys due in May.

8. Low density and sparsely distributed *Beggiatoa* has been recorded within the World Heritage Area of Macquarie Harbour. The direct relationship between *Beggiatoa* presence in the WHA and the marine farming activities has been detected only in relation to a fifty metre intrusion over the World Heritage Area boundary of continuous *Beggiatoa* extending from Lease 266. The sparsely distributed patches of *Beggiatoa* elsewhere in the harbour are directly related to the widespread low levels of dissolved oxygen.
9. Ongoing benthic surveys in Macquarie Harbour by IMAS have highlighted deterioration in conditions under and around the farms, a significant decline in the total abundance and number of species collected from the benthic infauna at all of the leases assessed and provides significant concerns regarding the potential for sediment “souring”. The most recent survey by IMAS in January 2017 revealed patterns in the abundance and number of species of benthic fauna largely unchanged from the October 2016 survey, with the exception of a lease in the deeper central harbour where there was a further decline. Later sampling referenced in the IMAS April 2017 report raised the possibility of some faunal recovery.
10. The April 2017 update on the status of dissolved oxygen and benthic conditions in Macquarie Harbour by IMAS stated that dissolved oxygen conditions in the middle and bottom waters remained extremely low in late 2016 before a replenishment of oxygen was seen in the deep bottom waters in early 2017. While this replenishment may have had a role in those areas exhibiting benthic recovery, it may be short lived as the benthic oxygen demand remains high. Given that DO levels in the middle of the water column remain low, and this mid-water region represents a much larger proportion of the total water in the harbour, there is still clearly capacity for the DO levels in bottom waters to decline.

11. The long term monitoring of dissolved oxygen (DO) across Macquarie Harbour has revealed a steady decline in middle and bottom water oxygen concentrations since 2009 to the current extremely low levels. There is still uncertainty as to whether there is a single hypoxic water body that runs along the bottom of the Harbour from the heads to the WHA or whether there are two or more separate 'halos' of depleted DO water in the central basin. Whilst it is clear that farming can affect the DO levels within and under cages, it is not currently clear to what extent individual farms contribute to the low DO water body (bodies) in the broader Harbour.
12. The environmental health of Macquarie Harbour, in particular levels of DO in the bottom waters, is likely to represent a crucial factor in the future well-being of the Maugean Skate population. Low DO concentrations appear limiting for the skate and presumably their prey. Maugean Skate eggs may be deposited in depths greater than 20 metres, thereby exposed to low DO concentrations.
13. Previous research has shown a clear impact gradient associated with cage salmon farming operations, and the presence of bacterial mats (*Beggiatoa spp.*). Proliferation of opportunistic species are features commonly associated with high levels of organic enrichment.
14. Marine farmers in Macquarie Harbour continue to have divergent views with respect to an appropriate biomass cap for farmed finfish in Macquarie Harbour.
15. If no biomass decision is made, the predicted biomass for Macquarie Harbour from May to December 2017 would reached about 18,000 tonnes based on current stocking levels and currently proposed 2017 smolt intake levels.

Evidence for the decision

The evidence on which my above findings are based includes:

- a) Cawthron Report, *Macquarie Harbour Environmental and Fish Health*, August 2015;
- b) a personal briefing on 9 November 2016 from Dr's Catriona McLeod and Jeff Ross from Institute of Marine and Antarctic Studies (IMAS) summarising the current level of knowledge regarding the ecological status of Macquarie Harbour utilising data collected by EPA Tasmania, industry, IMAS, and the CSIRO through separate monitoring programs (this was subsequently summarised into a multi-page Advice Note);

- c) the final IMAS Technical Report (Environmental Research in Macquarie Harbour - Interim Synopsis of Benthic and Water Column Conditions: Jeff Ross & Catriona MacLeod, January 2017);
- d) EPA Compliance Summary, Macquarie Harbour, September 2016;
- e) EPA Compliance Summary, Macquarie Harbour, January 2017;
- f) IMAS draft report (28 April 2017) and Jeff Ross pre-briefing progress report on 14 March 2017 at EPA office, and the FRDC project Steering Committee on 28 April 2017;
- g) a verbal briefing from Tassal Group Limited (Tassal) on relevant specific lease / fish performance information on 5 January 2017 and other matters on 22 November 2016, and numerous meetings during the period 5 January 2017 to 26 April 2017 to discuss the development fish waste collection system (including on 1 February 2017, 1 March 2017, 16 March 2017, 22 March 2017);
- h) a verbal briefing from Huon Aquaculture Group (Huon) on relevant specific lease / fish performance information on 9 January 2017 and other matters on 16 November 2016, and meetings on 18 January 2017, 30 January 2017, 22 February 2017, 23 March 2017;
- i) meetings with Petuna Aquaculture Pty Ltd (Petuna) on 24 November 2016, and 9 March 2017;
- j) the following submissions in response to my draft proposed Macquarie Harbour biomass determinations dated 29 November 2016: from Tassal, dated 22 December 2016, Huon, dated 3 January 2017, and Petuna's stocking plan, received 15 December 2016;
- k) correspondence from Tassal dated 17 January 2017, 20 March 2017 and the final submission submitted on 26 April 2017 (including Tassal's Draft Notice of Intent for ongoing environmental and farmed stock management in Macquarie Harbour);
- l) further submissions regarding allocation and management in Macquarie Harbour from Petuna dated 14 March 2017;
- m) correspondence and a further submission from Huon dated 4 April 2017 and 4 May 2017;

Reason for the decision

Complex physical and ecological relationships are at play in Macquarie Harbour including the relationship between the operational impacts of leases; Macquarie Harbour hydrodynamics (including fresh water inputs into Macquarie Harbour, deep central basin and shallow sill at the mouth with restricted water exchange to ocean) and climatic and seasonal variation. Further, the environment of the harbour is clearly subject to changes, both over short time-scales and longer-term.

The steady long-term decline in dissolved oxygen (DO) to levels currently seen, is of significant concern. Historical data tells us that increases in DO have occurred in the bottom waters of Macquarie Harbour over time but that these are transitory. While there are recent signs of recovery due to oxygen recharges, I do not view the increase in DO in early 2017 as evidence of a sustained, long-term increase in oxygen levels to these bottom waters.

Current research tells us that fish farming has some part in contributing to the low DO seen in the bottom waters of Macquarie Harbour, but to what extent is currently unknown. Natural factors are also at play. The science to date is inconclusive as to any clear apportionment of cause and effect or whether any tipping point might apply. The science supports the view that environmental conditions of Macquarie Harbour having changed in a sustained way in recent years. Natural and non-farming anthropogenic influences (e.g. releases from the Gordon Dam, potential influences of copper impacts from King River flooding on benthic conditions and biological communities) have and continue to have effects upon the harbour that are largely beyond the control of the aquaculture industry. Farming from this point on needs to recognise and remediate its impacts (which have been increasing with the expansion of farming) to ensure a sustainable development for future generations.

The current extremely low levels of DO of the bottom waters present a significant risk to the ecology of the harbour. A consequence of this is a significant decline in the abundance and diversity of benthic infauna in existing hypoxic zones. This threatens the sustainability of aquaculture through reduced benthic processing of organic waste from salmon pens.

Marine Farming Licence Conditions relating to environmental management of finfish farms in Macquarie Harbour require compliance with environmental standards. One requirement is

that there must be no significant visual impacts at, or extending beyond, 35 metres from the boundary of the lease area.

The significant increase in lease benthic non-compliance in the September 2016 survey and the further increases in non-compliance in the January 2017 survey is indicative of deteriorating environmental conditions which will negatively impact on the ecological processes and genetic diversity of the benthic population of Macquarie Harbour.

Whilst the January 2017 benthic surveys show a reduction in compliance from the September 2016 surveys as a result of the increase in the extent of *Beggiatoa* at non-compliance points, several companies have undertaken additional surveys in March and April and have reported a reduction in *Beggiatoa* extent. This is likely explained by the increase in DO in the bottom waters to some areas associated with the recharge events in early 2017 (referred to above) and may not result in long term recovery.

Whilst IMAS sampling in late Jan/early Feb 2017 showed decreases in the amount of *Beggiatoa* at some compliance points and initial indicators of infauna recruitment at some sites, this did not correspond with results indicating an overall improvement in sediment conditions. Renewal of organisms within the sediments that are seriously depleted will not occur without appropriate conditions over a period of time.

The most recent monitoring of benthic condition has indicated that the number of sites in the TWWHA at which *Beggiatoa* spp. was observed has increased over the period January 2015 (zero of ten sites) to January 2017 (seven of ten sites). This is indicative of a low oxygen environment and a source of organic input; however, these observations do not indicate the source of the organic matter or the drivers of the environmental conditions which have led to the presence of *Beggiatoa* spp. at TWWHA sites.

Recent industry monitoring in April 2017 indicates that the number of TWWHA sites with observed *Beggiatoa* spp. has reduced to two of nine sites, which may reflect the influence of DO renewal in bottom waters. This will be assessed again in May 2017.

Benthic infauna sampling conducted by IMAS in the TWWHA has indicated a significant decline in the abundance and diversity of benthic species in October 2016 and January 2017 in the deep water sites within the TWWHA, when compared with early 2015/2016 surveys.

In terms of direct fish farm impacts on the TWWHA, the January 2017 results of video monitoring from the Tassal “Franklin” lease (located approximately 1 km outside of the TWWHA boundary) demonstrated *Beggiatoa* spp. extending from the lease to approximately 50m across the TWWHA boundary. This does appear to constitute a likely lease impact within the TWWHA at that particular location.

In terms of broader ecological processes within the Harbour, reductions in dissolved oxygen and benthic infauna could potentially have negative implications for the endangered Maugean skate and other fauna.

Macquarie Harbour is currently under stress. My short-term biomass allocation expired on 30 April 2017 at which time there is no maximum permissible biomass limit for Macquarie Harbour. If no biomass decision is made, a harbour wide biomass that is predicted leading up to December 2017 would possibly exceed 18,000 tonnes, and more importantly, there would be no control in place to limit the 2017 year class smolt introduction. This would not provide any effective control on farming in Macquarie Harbour and would not support the sustainable development of the harbour.

All of the above, in combination, cause me to believe that the Harbour needs to be managed under a lower biomass than 14,000 tonnes. I note that Huon Aquaculture believes it should be below 10,000 tonnes and has presented their interpretation of the available data to support that view. However, I believe that from the evidence available, including the early signs of recovery due to increased oxygen in the bottom waters, that a cut to this level is not warranted. Hence I believe 12,000 tonnes is an appropriate biomass to manage the harbour at for the next 12 to 18 months.

My decision reduces the biomass in Macquarie Harbour to a level that encourages remediation of harm and promotes mitigation of any adverse effects that fish farming has on the Harbour. This is integral in maintaining the productive capacity of the harbour in the long term. Two major mass fish mortalities have already occurred as a result of bottom low DO waters being pushed up into the fish pens following recharge events.

Macquarie Harbour currently accounts for 30% of the grow out sites in Tasmania. Considering the strategic importance Macquarie Harbour plays to all farmers, the whole Tasmanian industry would be at stake if farming was no longer sustainable in the Harbour. The flow on

effects of serious environmental degradation to Macquarie Harbour including the WHA waters extends to other industries including tourism and would impact any commodity that relies on the 'Clean Green' Tasmanian Brand in its marketing.

Biomass allocation

Findings on question of fact

In making my decision, I made the following findings of fact:

1. An apportionment of a harbour wide biomass for the 2016 year class portion of the total biomass should be calculated on the percentage of hectares held by each company, which respects the Area Management Agreement (AMA) ratified by Huon, Petuna and Tassal on the Harbour expansion and is a reasonable basis to set a biomass limit of 13 tonnes per hectare.
2. However, the 2016 year class salmon in the harbour in excess of 13 tonnes per hectare will provide a significant social and economic benefit to the Strahan and the wider NW coast community. Therefore, removal of the excess fish prior to planned harvesting will significantly impact the community.
3. Tassal has advised me of significant economic and social costs if it is unable to harvest all of its 2016 year class fish when fully grown.
4. Macquarie Harbour is of strategic importance in Huon, Petuna and Tassal's business operations.
5. The whole of lease 266 is currently not farmable and has been destocked, and cannot be restocked until it meets the appropriate performance requirements. Moving salmon from leases 214 or 219 to 266 is not an acceptable management solution due to the level of benthic impact on and around that lease.
6. Marine farmers in Macquarie Harbour have divergent views with respect to an appropriate management method to be applied in Macquarie Harbour.

7. A lease by lease management model for Macquarie Harbour may be more appropriate but will be complex to establish and regulate and would be better managed under the environmental licensing arrangements being proposed by the Government. An appropriate lease by lease approach will be considered and developed for the 2018 smolt intake. At this point in time, an individual lease approach can only be applied to lease 266 because it is appropriate to exclude it from the 2017 smolt intake calculations.
8. The allocation of the 2017 year class will be based on an available lease area to grow salmonids of 805.89 hectares, with the Franklin lease area not included in the calculation of the 2017 intake. This will mean that effective share of the smolt intake will be allocated as: 51.61% to Petuna; 28.53% to Huon; and 19.85% to Tassal. This is based on the assumption that a total biomass of 12,000 tonnes in December 2018 is made up of 90% 2017 year class fish and 10% 2018 year class fish, the companies will need to factor this into their stocking plans. The specific number of smolt authorised to go into the Harbour will be determined with each company when the proposed stocking plans are submitted.
9. Tassal has requested authority to conduct a trial of its waste capture and recovery system. Any system approved by me is to capture solid fish waste from beneath the fish cage substantially preventing it from settling on the harbour floor. Solid waste must be removed from the lease and taken to land for disposal. Supernatant discharged will need to meet water quality discharge parameters set by the Director.
10. The development and use of waste collection systems will require significant capital and will require ongoing monitoring, both on the sea bed of the lease and of the equipment itself. This activity, should it be approved, will be managed under an Environment Protection Notice (EPN) under the *Environmental Management and Pollution Control Act 1994*, not the marine farming management controls under the Marine Farming Development Plan. The proposal will be assessed by EPA Tasmania, and I will then release any EPN and the Environmental Effects Report once a decision has been made.

11. While waste collection is technically feasible, it will be a challenging endeavour in Macquarie Harbour and will need to be carefully planned, executed, monitored and subject to ongoing review. There will need to be pre-agreed performance standards that if not met will result in fish being removed from the Harbour before their planned commercial harvest. EPA Tasmania's assessment and monitoring work will be fully cost recovered from the respective companies under the charging system for EPNs.

Evidence for the decision

The evidence on which my above findings are based includes:

- a verbal briefing from Tassal Group Limited (Tassal) on relevant specific lease / fish performance information on 5 January 2017, and the meetings listed previously;
- correspondence from Tassal dated 17 January 2017, 20 March 2017 and the final submission submitted on 26 April 2017 (including Tassal's Draft Notice of Intent for ongoing environmental and farmed stock management in Macquarie Harbour);
- letter from Tassal dated 20 March 2017;
- further submissions regarding allocation and management in Macquarie Harbour from Petuna dated 14 March 2017;
- correspondence, and further submissions from Huon dated 4 April 2017 and 4 May 2017.

Reason

The resource management and planning of aquaculture in Macquarie Harbour is a shared responsibility between the Regulator and industry. The complex environment that is Macquarie Harbour and the continued uncertainty in the growing body of scientific work understanding the Harbour has created divergent views within industry of how the Harbour is to be managed.

Applying the Harbour wide biomass of 13 tonnes per hectare as decided, if apportioned equally between the leaseholders based on their percentage of leased areas, and based on each company's harvest plan to grow out its 2016YC using their traditional farming practices will mean that Tassal will exceed its allocated biomass portion by in the order of 4,500 tonnes until harvest commences in December 2017

Tassal has specifically requested additional approval to be allowed to grow these fish through to harvest size and has committed to invest significant resources into developing and implementing a waste capture system.

Whilst I acknowledge that the system is novel and untested, I am prepared to assess and subsequently approve a waste collection system that removes organic matter from the harbour, if I am satisfied that it can be developed, implemented and managed in a way that significantly reduces the benthic impact and does not pose a significant risk to the mid water environment or the other marine farms.

Waste collection systems will be required to be installed to collect waste from 1.5 tonnes of fish for every tonne of fish to be grown through that is in excess of the peak biomass allocation determined as above. For example, should Tassal wish to grow all the current 2016 year class fish through to harvest size they will need to capture waste from all pens holding 2016 year class fish. The intent of the waste collection system is to capture the waste before it settles on the harbour floor, and not to extract it from the harbour floor.

In making my decision to allow Tassal to implement an approved waste collection system I will provide an additional biomass allocation of up to 15 tonnes per hectare for the 2016 year class only.

I acknowledge the significant economic loss that Tassal and the broader Tasmanian community would face in culling the unauthorised portion of Tassal's 2016 year class. However, foremost, my decision needs to ensure the sustainability of the Harbour, and needs to be consistent with the objectives of the legislation and the Resource Management Planning System of Tasmania.

Objectives of the resource management and planning system of Tasmania

Section 3

1. The objectives of the resource management and planning system of Tasmania are –
 - (a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and
 - (b) to provide for the fair, orderly and sustainable use and development of air, land and water; and

(c) to encourage public involvement in resource management and planning; and

(d) to facilitate economic development in accordance with the objectives set out in paragraphs (a), (b) and (c); and

(e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

2. In clause 1(a), *sustainable development* means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –

(a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and

(b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and

(c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

Petuna and Huon may also want to invest in waste capture systems for their 2016 year class which I will assess upon on the same terms I will be providing to Tassal.

Lease 266 (Tassal) is currently non-farmable. Any biomass calculation for the 2017 smolt intake that included these areas would increase the loading on the remaining 2 leases held by the company. For this reason, this lease area has been excluded from the 2017 year class smolt calculation and I will not authorise the stocking of fish until such time that the whole lease comes into compliance. It is my decision not to apportion the reduced area between all leaseholders which acknowledges that Tassal's past farming practising on 266 resulted in significant non-compliances where it had to be directed to fallow the whole lease area.