

Statement of Reasons

SUBJECT: MF 266 (TASSAL, FRANKLIN) RE-STOCKING ASSESSMENT JULY 2018

DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY'S DECISION

To approve the application to re-stock lease MF266, subject to licence restrictions to limit the area of the lease to the proposed new grids, to increase the compliance monitoring to monthly and to place a limitation on biomass and impose a total feed input limit.

Conditions

1. Only the pen bays within the proposed new grids are approved for stocking (as defined by the grid boundary corner coordinates in Figure 2).
2. All other areas of the lease to remain under fallow direction and must not be re-stocked without approval.
3. Any additional areas of the lease (including A positions on proposed new grids) would require pre-stocking assessment and approval from the Director, EPA prior to stocking.
4. Stocking approval is only granted for the period 16 July 2018 to 31 May 2019.
5. A maximum biomass limit of 3000 tonnes will apply for the lease.
6. A total feed input limit of 4500 tonnes is set for the July 2018 – April 2019 period.
7. Monthly reporting to EPA of feed input in kg per pen bay and feed type including provision of feed size and composition information for each feed type used on the lease.
8. Monthly reporting to EPA of total biomass per pen bay on MF266
9. Visual compliance monitoring at compliance points to be undertaken monthly (monitoring plan and site specifications to be issued separately).
10. Full compliance surveys to be undertaken in September 2018, January 2019 and May 2019, as per existing requirements.

BACKGROUND

Marine Farming Lease No. 266 (Franklin) is located in south central Macquarie Harbour, approximately 1km outside the Tasmanian Wilderness World Heritage Area boundary.

Due to significant non-compliances identified at Franklin lease in the September 2016 video survey Tassal Operations Pty Ltd (Tassal) were directed to destock the lease (14 November 2016) and further requirements for destocking, remediation and survey work were issued in February 2017. Following the September 2016 Survey Tassal completed its analysis and reporting during October and has provided the report to EPA in late October. Tassal advised that destocking of the Franklin lease was completed on 10 April 2017.

Tassal has submitted a re-stocking application on the basis that Petuna Aquaculture will operate the lease as a smolt introduction lease under the new Joint Venture Agreement. The companies have submitted a proposed lease management plan to the Director outlining their request to re-stock this lease with 2018YC smolt, commencing in July 2018. This lease management plan outlines a Joint Venture approach in Macquarie Harbour between Tassal and Petuna Aquaculture, which seeks to establish a longer-term stocking and management strategy with the aim of utilising both company's Macquarie Harbour leases in a way that will achieve better environmental and biosecurity outcomes.

Tassal were required to undertake a comprehensive post-harvest environmental survey in May 2017, and undertook comprehensive “post-fallow” surveys in both January 2018 and April 2018 to assess recovery/status of sediment visual characteristics, benthic infauna and sediment chemistry within the lease and at 35 m compliance points.

EPA requested Dr Jeff Ross of IMAS to review of the post-harvest and post-fallow environmental survey reports submitted by Tassal, consider any relevant additional information collected by IMAS in Macquarie Harbour, and provide advice to the Director regarding condition of the sediments and recovery status following the impacts identified in Spring/Summer 2016/2017. Dr Ross submitted his report to the Director on 7 July 2018.

Tassal also conducted pre-stocking visual surveys of 20 pen bays across 2 proposed new grids (10 pen bays per 20 pen bay grid on previously unfarmed sediment) on Franklin lease in June 2018.

Since de-stocking Tassal have also been required to continue to undertake 4-monthly compliance surveys for visual impact at compliance points, with the most recent assessment being in May 2018.

Information reviewed as part of this assessment or relevant to this statement are listed in Table 1.

Table 1. Summary of information relevant to the MF266 re-stocking assessment.

Document	Submitted (and most recent version number if applicable)	Comment
Tassal letter to the Director, EPA: Request to stock MF266 with 2018 smolt	29 June 2018	Outlines re-stock request, Joint Venture approach, brief summary of Tassal interpretation of environmental surveys
Tassal MF266 Stocking Plan	4 July 2018 V0.3	Information to accompany Tassal re-stock request. Includes history of lease, re-stocking proposal, summary of environmental survey results, comparison of historic vs forecast feed inputs, overview of alternative options and contingency plan.
Email from Richard Miller in response to draft decision requesting contingency approval to allow stock on the lease until 31 May 2019.	9 July 2018	Request extension of stocking period until 31 May 2019 as a contingency in case of warm conditions that may delay the movement of fish due to potential fish welfare concerns.
Summary of DEPOMOD modelling for MF266 (report by Marine Solutions for Tassal)	29 June 2018	Brief overview of depositional modelling outputs (DEPOMOD v2.4.1) of intended YC18 production cycle on MF266 (August 2018 – April 2019).
MF266 Post-Harvest Environmental Survey (report by Aquenal for Tassal)	29 September 2017 v1.0	Report on May 2017 survey of hydrodynamics (current monitoring), visual appearance of sediments, sediment chemistry (including metals, AVS, SEM) and benthic infauna within MF266 and at 35m compliance sites, and comparison with 2012 baseline survey where possible.
MF266 Environmental Recovery Assessment, January 2018 (report by Aquenal for Tassal)	7 June 2018 v1.2	Report on January 2018 survey of benthic infauna, sediment chemistry and visual appearance of sediments within MF266 and at 35m compliance locations, and comparison with previous survey results where possible. (v1.0 submitted 29 March 2018 and v1.1 submitted 4 June 2018 after EPA review)

MF266 Environmental Recovery Assessment #2, April 2018 (report by Aquenal for Tassal)	28 June 2018 v1.1	Report on April 2018 survey of benthic infauna, sediment chemistry and visual appearance of sediments within MF266 and at 35m compliance locations, and comparison with previous survey results where possible. (note v1.1 cover page says version 1.0; v1.1 updated with April 2018 organic content results; v1.0 submitted 6 June 2018))
EPA request for IMAS review – background and scope	4 May 2018	EPA overview of lease compliance history, recovery monitoring requirements and terms of reference for IMAS review (i.e. focus questions for IMAS review) (note updated request to also review April 2018 survey sent 7 June 2018)
IMAS Review	Draft submitted 8 July 2018	Review found that Tassal monitoring and reporting met the EPA's requirements and the findings were consistent with the IMAS research. Overall, these findings indicate that while some recovery has occurred in the benthic fauna of lease 266, the environment of Macquarie Harbour has limited capacity to assimilate organic matter due to factors that limit oxygen recharge of the deeper waters of the harbour, including broadscale physical drivers.
June 2018 pre-stocking visual surveys (Tassal) – EPA summary	Submitted 22 June 2018, assessed internally 22 June 2018	EPA assessment of pre-stocking video footage at 20 of 40 proposed pen bay locations.
May 2018 compliance survey – EPA assessment	Submitted 22 June 2018, EPA assessment finalised 4 July 2018	EPA assessment of May 2018 compliance survey at MF266 and June 2018 follow up dives
January 2018 compliance survey – EPA assessment	EPA assessment finalised 5 April 2018	EPA assessment of January 2018 compliance survey at MF266 and February 2018 follow up dives
September 2017 compliance survey – EPA assessment	EPA assessment finalised 21 December 2017	EPA assessment of September 2017 compliance survey at MF266
May 2017 compliance survey – EPA assessment	EPA assessment finalised 15 August 2017	EPA assessment of May 2017 compliance survey at MF266

TASSAL RE-STOCK APPLICATION PACKAGE – KEY POINTS

- The stocking plan proposes stocking 2 new 20 pen-bay grids on MF266 with 2018YC Tassal and Petuna smolt (Figures 1 and 2).
- The intention of the Joint Venture is to grow 2018YC smolt on MF266 before transferring to northern leases for grow out and fallowing MF266 for 15 months, prior to introduction of 2020YC smolt (Figure 3). The stocking plan proposes stocking Petuna's lease MF213 with the 2019YC smolt. This approach is expected to result for this and future year classes in improved environmental and biosecurity outcomes in Macquarie Harbour. This has been a key consideration in the decision process.
- The proposal would require stocking of both grids, commencing smolt input in July 2018, for ~10 months through to April 2019 (noting a request to extend the approved stocking period until 31 May 2019 as a contingency in case of warm conditions that may delay the movement of fish due to potential fish welfare concerns).
- Biomass and feed forecast data for MF266 July 2018 – April 2019 provided by the companies indicate a forecast maximum biomass of ~3000 tonnes in April 2019 (2978 t) and a total feed input over the 10 month period of ~4300 tonnes (maximum monthly input 703 tonnes in April 2019).
- The proposed 2018YC feed input on MF266 represents 37.5% of the feed input for the 2015YC at the same lease, or 60% of the feed input for a comparative period between July 2016 and April 2017.
- For comparison, biomass and feed inputs since the lease was first stocked in January 2014 and forecast biomass and feed inputs for the 2018YC are presented in Figure 4. Biomass peaked at just under 8000 tonnes in 2014 and again in 2016, with the lease being used to grow out successive year classes across two 22 pen-bay grids, as well as some A-positions.
- The Joint Venture partners have committed to working with EPA and IMAS to develop a monitoring plan that supports the proposal.
- The proposal summarises Tassal's interpretation of environmental survey work: recovery in some sediment chemistry and benthic infauna indicators in April 2018, and visual indicators at internal sites; confounded by increasing *Beggiatoa* at compliance sites in April 2018. April 2018 survey report identifies overall "low organic enrichment" at compliance and internal "new grid" sites, and high or recovering organic enrichment at "old grid" sites.
- The proposal outlines other options considered for 2018YC smolt input, with MF266 identified as the preferred approach.
- The contingency option identified as "relocating individual sea cages over degraded sediments" to MF213 (adjacent lease Bryans Bay) if there are "signs of significant adverse environmental impacts".
- DEPOMOD modelling identified depositional footprint for 2018YC inputs remaining within lease boundary, however there is a requirement for ground-truthing/validation if it is to be useful in the future.

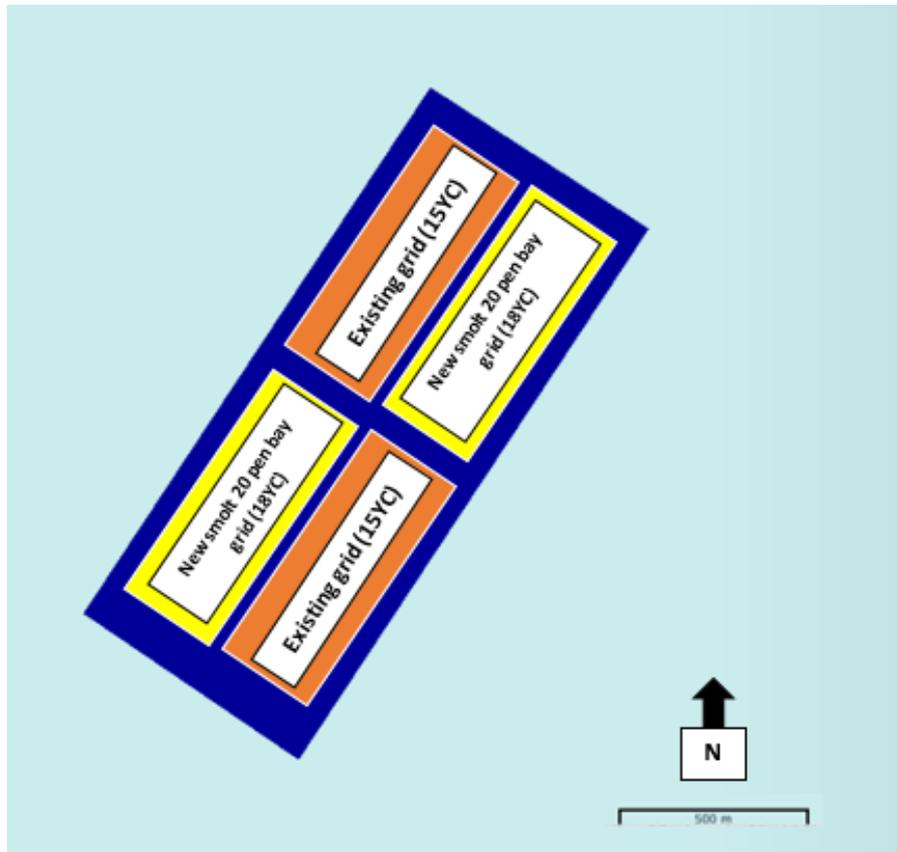


Figure 1. Proposed new grid (18YC) and old grid locations, MF266.

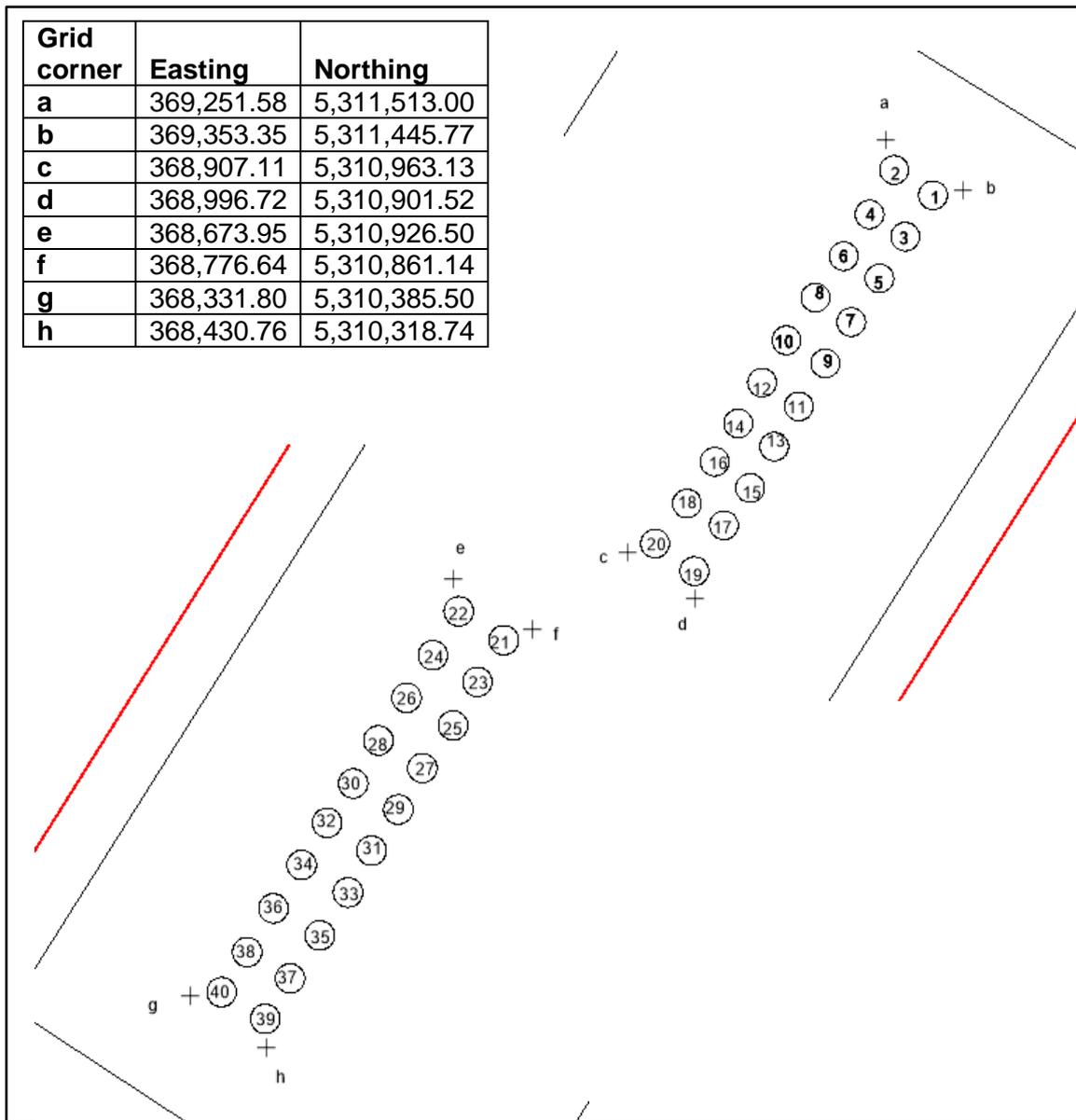


Figure 2. Proposed new grid pen bay layout and grid corner coordinates as provided by Tassal.

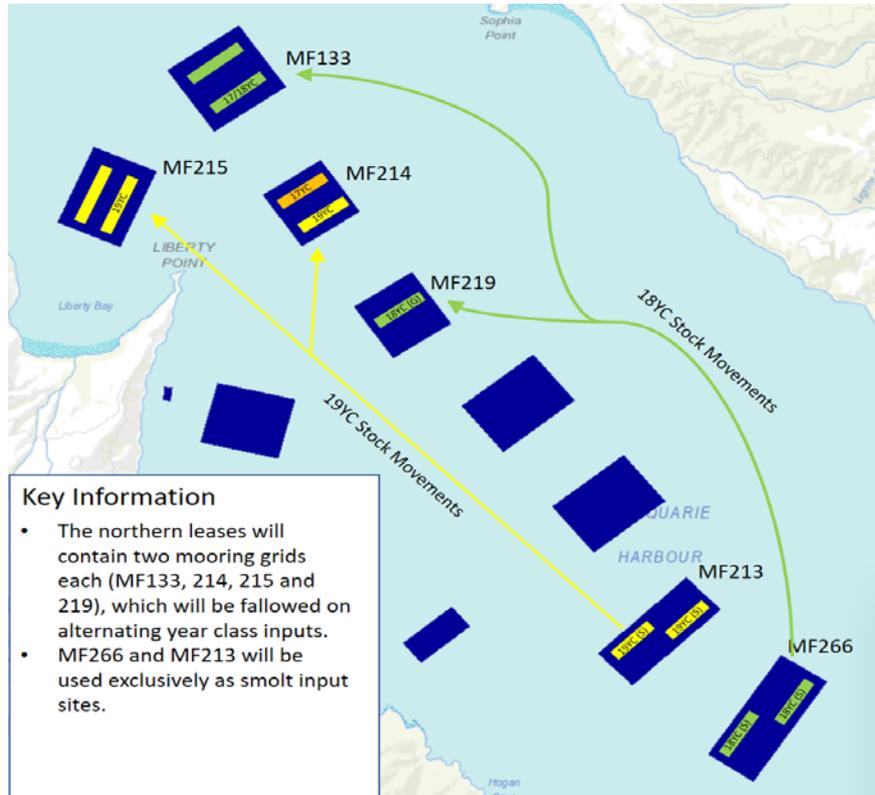


Figure 3. Schematic of stock movements (2018 and 2019 YCs) under the proposed Joint Venture arrangement.

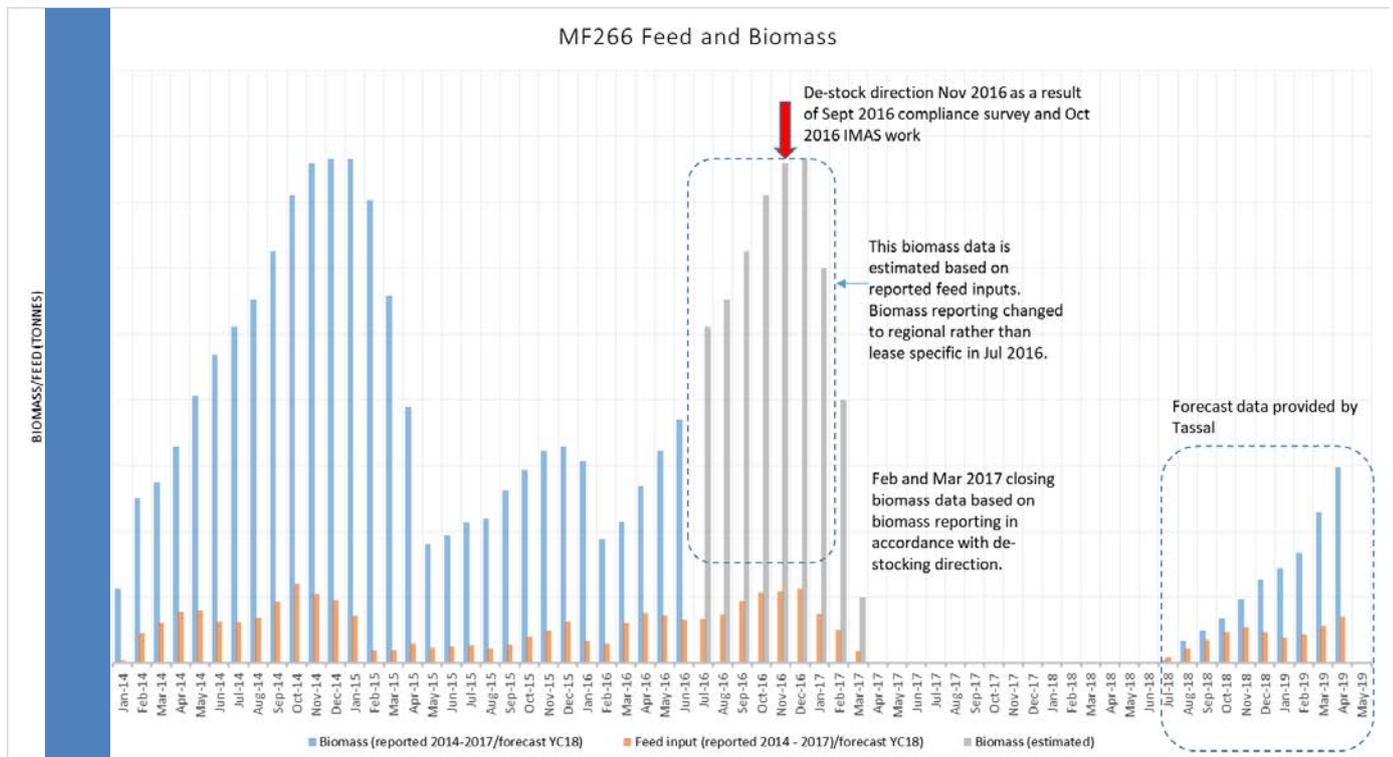


Figure 4. Comparison of biomass and feed input data for MF266. Jan 2014 – 2017 feed data and 2014 – Jun 2016 biomass data based on licence holder reporting. Jul 2016 – Jan 2017 estimated from reported feed inputs (reporting requirements for Macquarie Harbour biomass changed to total biomass across all leases for each company in Jul 2016). 2018YC forecast data provided by Tassal.

RECENT COMPLIANCE HISTORY – KEY POINTS

- The location of all MF266 35m compliance points is mapped in Figure 5 (not all compliance points were surveyed at every survey).
- Starting with the first annual video survey in January 2015, low numbers of non-compliant 35m sites (presence of *Beggiatoa*) were recorded at each 4 month survey (1-3 sites per survey) and these tended to occur at sites off the end of each grid. Management directions included progressive fallowing of pen bays at the ends of grids, and a requirement for depositional modelling.
- At the peak of impact in Spring/Summer 2016/2017, there were 14/21 non-compliant 35m sites in September 2016 (maximum extent 785m) and 19/21 non-compliant 35m sites in January 2017 (maximum extent at least 1035m). *Beggiatoa* cover included thick and thin mats outside the lease boundary. *Beggiatoa* was observed on all lease boundaries, but the southern half of the lease had the greatest extent of impact, with zone of *Beggiatoa* extent over January – April 2017 indicated in Figure 6.
- Following de-stocking in April 2017, all compliance sites were assessed as clear of *Beggiatoa* in May and September 2017.
- Since January 2018 this lease has had variable 35m non-compliances (generally isolated patches of *Beggiatoa*) around the southern half of the lease – 1/14 sites in January 2018 (5.2, clear in February), 5/14 sites in April 2018 (5.2, 6.2, 8.2, 9.2 and 10.2), 2/14 sites in May 2018 (5.2, 6.2) and 1/14 sites in June 2018 (6.2).
- While dissolved oxygen and farming inputs are both drivers of *Beggiatoa* presence, the cause of the isolated/patchy but variable presence of *Beggiatoa* around MF266 in 2018 is not immediately clear, given the lease has been de-stocked since April 2017 and the boundaries were clear of *Beggiatoa* in May and September 2017. Dissolved oxygen levels are driver of *Beggiatoa* but bottom water dissolved oxygen levels were substantially higher in January – April 2018 than during the 2017 Spring, which does not explain the pattern of increased *Beggiatoa* outside the lease.
- Regardless of the cause of the sediment/water column conditions, which allow the growth of *Beggiatoa*, the variable presence of *Beggiatoa* around MF266 indicates this is a sensitive receiving environment with limited assimilative capacity for organic input.
- Given the *Beggiatoa* presence there is a risk of non-compliances at the boundary within the proposed 2018YC stocking period.
- Given the ongoing non-compliance is at site 6.2, and the variable non-compliances have all been around the southern half of the lease, the proposed new SW grid possibly represents an area of risk in terms of out-of-lease non compliances. Pre-stocking surveys (outlined below) also found that the sediments under this proposed SW grid were in poorer condition than the proposed NE grid, with light patchy *Beggiatoa* at a number of sites.
- However, as of May 2018 compliance sites adjacent to and off the end of the proposed new grid locations were clear of *Beggiatoa*, and in this respect, the compliance result from May 2018 would not of themselves preclude re-stocking approval at these proposed new grid locations.
- The non-compliances at sites 5.2 and 6.2 would certainly indicate that the SE old grid location would not be suitable for re-stocking (also noting that while Tassal have not requested re-stocking approval for the old grid locations, both old grid locations would likely be assessed as unsuitable for stocking at this stage based on sediment condition reported via the post-fallow surveys).

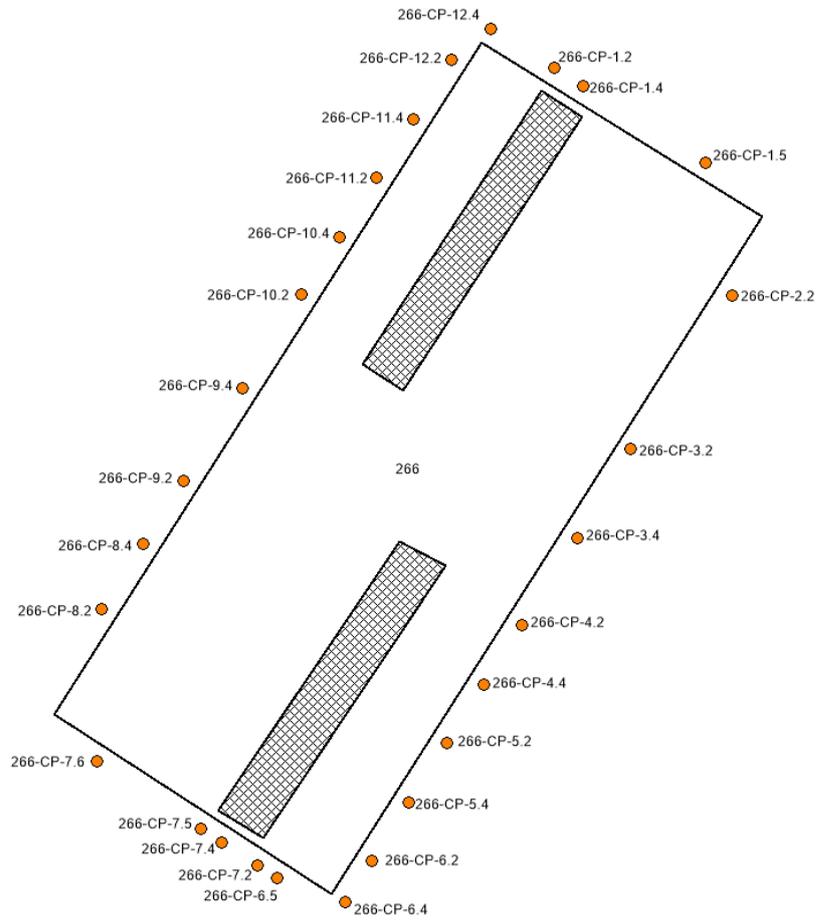


Figure 5. Location of all MF266 compliance site locations and indicative “old grid” (Jan 2014 – April 2017) locations.

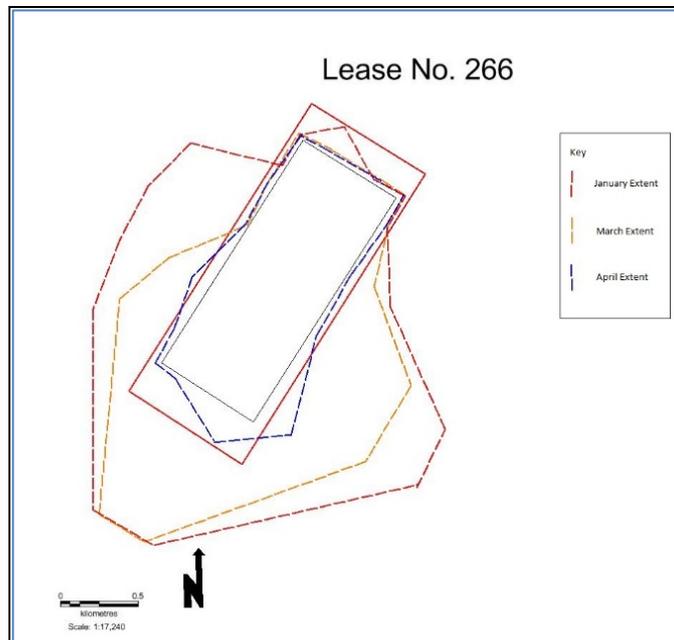


Figure 6. Extent mapping undertaken by Tassal at MF266 showing the extent of *Beggiatoa* in January, March and April 2017.

PRE-STOCKING ASSESSMENT OF SEDIMENTS UNDER PROPOSED NEW GRIDS – KEY POINTS

- The sediments in the vicinity of the proposed new grid locations were visually surveyed in January 2018 (4 sites along each proposed grid centre line, April 2018 (8 sites along each proposed grid centre line) and June 2018 (10 pen bays on each proposed 20 pen bay grid) (Figure 7). Note that between April 2018 and June 2018, changes to final mooring positions resulted in both grids moving in from the lease boundary closer to old grid locations (approximately 70m closer for the proposed SW grid and 130m closer for the proposed NE grid), this is not considered to be significant.
- In relation to indicators of organic enrichment, sediments under the proposed NE grid (NG2 sites) have consistently appeared in better condition than sediments on the proposed SW grid (NG1 sites).
- Patchy *Beggiatoa* was observed at a number of these sites in January 2018, April 2018 and June 2018.
- The decline in *Beggiatoa* presence between January and April 2018 may reflect the influence of the summer dissolved oxygen recharges and possibly recovery of internal sediments close to impacted old grid locations (however noting presence of light patches of *Beggiatoa* at compliance sites increased between January and April 2108).
- The presence of *Beggiatoa* between April and June 2018 possibly reflects the closer location of final new grid locations to old grid sites, however a decline was also observed at some sites which did not move closer to old grids in June 2018. Bottom water dissolved oxygen declined over the April – June period and this may have influenced the observed distribution of *Beggiatoa* at these internal sites. Dr Ross’ work supports this hypothesis. Noting however, that there has been improvement at compliance sites between April and June.
- Licence condition 1.2 of Schedule 3 states there must be no significant visual impacts within the lease area. Extensive bacterial mats (e.g. *Beggiatoa* spp.) on the sediment surface prior to restocking may be regarded as significant. Based on this licence condition and its application at other leases in Macquarie Harbour and other farming regions, while the presence of *Beggiatoa* in June 2018, it would not be assessed as “extensive” in relation to this licence condition.
- The January 2018 recovery survey also separated the two proposed grid sites based on primarily on visual indicators and benthic infauna, with the SW grid being categorised as “moderate organic enrichment” and the NE grid categorised as “low organic enrichment”. In April 2018, all new grid sites were categorised as “low organic enrichment” – however it is important to note that these sites were up to 130m away from the final grid locations (and further from old grid locations) and therefore there is possibly some doubt about the representativeness of those samples.

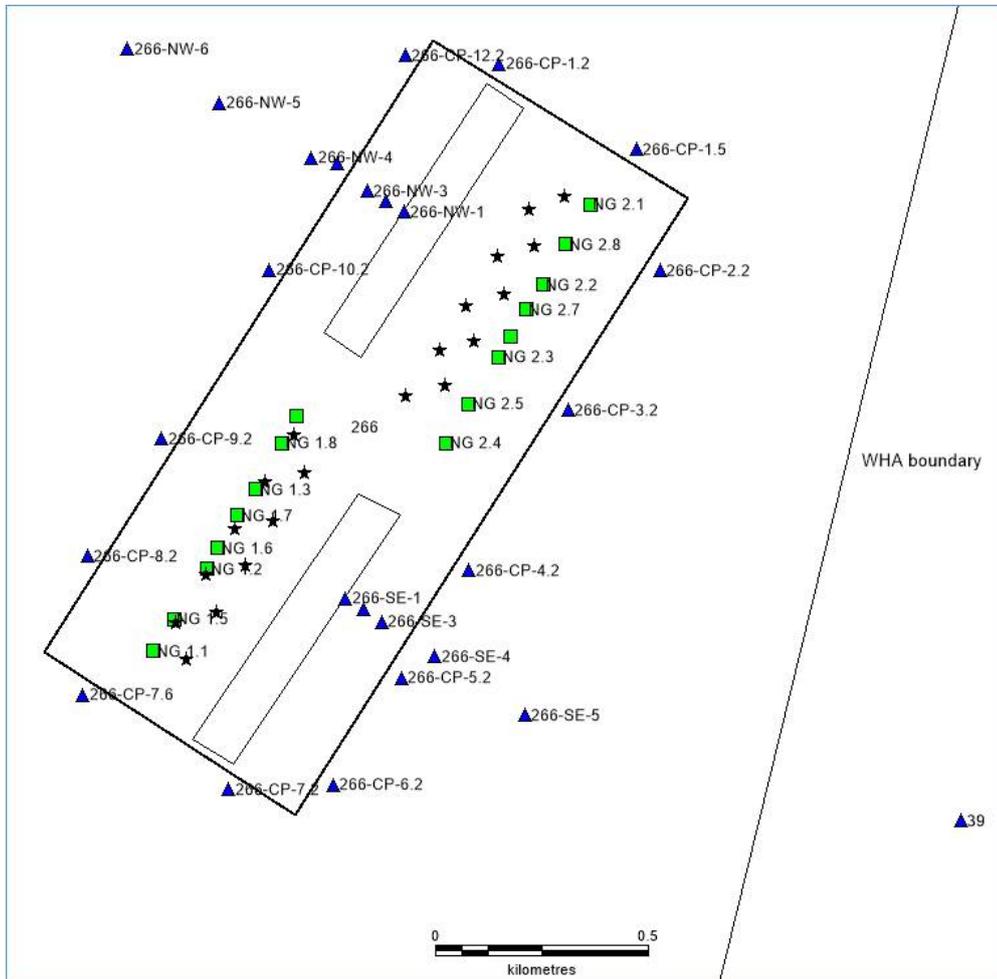


Figure 7. Pre-stock survey locations shown by green squares (January and April 2018, previous proposed centrelines) and black stars (June 2018, final grid locations). This map also shows compliance points and IMAS research transects (NW and SE) extending from the old grids, which are relevant to the IMAS review.

ENVIRONMENTAL RECOVERY SURVEYS AND IMAS REVIEW – KEY POINTS

- As a broad overview, the environmental survey reports submitted by Tassal (prepared by Aquenal) reflect:
 - Variable results with regard to visual indicators of sediment condition e.g. improvement (less *Beggiatoa*, less outgassing and less colonising Dorvilleids) at old grid sites over time but still evidence of high organic enrichment based on the presence of these indicators; increase of patchy *Beggiatoa* at compliance sites between May 2017, January 2018 and May 2018.
 - Sediment chemistry results showed either broadly comparable results across sites and survey times (eg visual assessment of cores, particle size analysis) or some improvement in April 2018 (e.g. there was no strong evidence of organic enrichment for redox potential or sulphide concentration in April 2018, compared with evidence of impacted sediments at some old grid locations in May 2017 and January 2018.). Organic content results showed were slightly higher in May 2017 and January 2018 than pre-farming in 2012, and levels are also slightly higher at internal sites compared with compliance sites.
 - Faunal abundance and diversity was generally low at most sample sites for all surveys, or higher abundances were dominated by organic enrichment indicator species (e.g. Capitellids, Dorvilleids). There were some temporal patterns observed, with faunal abundance and diversity declining between May 2017 and January 2018, indicating no evidence of benthic fauna recovery as of January 2018. By April 2018 diversity and abundance had improved, and was comparable to May 2017 (immediately post-harvest). In April 2017 another potential indicator of benthic recovery was a comparable benthic community structure between internal non-farmed sites and compliance sites, however old grid sites continued to show signs of organic enrichment evidenced by very depauperate fauna or very high densities of organic enrichment indicator species.
 - Assessment of recovery levels based on benthic infaunal analysis was considered complex due to several factors. A comparison with 2012 baseline data was treated with caution due to differences in the 2012 survey method, however this comparison does indicate that there have been substantial changes in benthic community structure at both internal and compliance sites since 2012, with some functional groups that were present in 2012 (e.g. molluscs, amphipods) being absent from the 2017 and 2018 surveys, while organic enrichment indicator species which were abundant in the 2017 and 2018 surveys were not recorded in 2012.
 - Assessment of faunal response and recovery in relation to organic enrichment was also complicated by the influence of broader scale drivers in particular dissolved oxygen.
 - The April 2018 survey noted that while some indications of improvement in benthic infauna were observed between January 2018 and April 2018, organic enrichment indicator species are still present at compliance sites. It also notes that some of signs of improvement in benthic health (e.g. higher species diversity) were evident previously in May 2017 before declining again in January 2018 – highlighting that benthic community structure in the vicinity of MF266 is likely to be variable in relation to the influence of broad-scale factors such as dissolved oxygen and organic inputs.
- The IMAS review requested by EPA (available in conjunction with this Statement of Reasons) found that Tassal monitoring and reporting met the EPA's requirements and the findings were consistent with the IMAS research. Overall these findings indicate that while some recovery has occurred in the benthic fauna of lease 266, the environment of Macquarie Harbour (particularly the southern end) has limited capacity to assimilate organic matter and lower recovery potential due to factors that limit oxygen recharge of the deeper waters of the harbour, including broadscale physical drivers. .

OVERVIEW AND OPTIONS RELATED TO THE DIRECTOR'S DECISION

- The Joint Venture proposal represents a lease management approach that may have harbourwide benefits with regard to environmental performance of leases and biosecurity, when progressed under the lower biomass allocation that has been provided for the next two growing cycles. This will result in longer fallowing periods and the ability to rest entire leases between year classes, allowing for better environmental recovery.
- The proposed 2018YC smolt input to MF266 represents a substantially smaller feed input and shorter stocking cycle than previously on MF266.
- Whilst not assessed for pre-stocking suitability, old grid locations are not considered to be in a suitable condition for stocking and need to continue to be fallowed.
- The presence of ongoing variable patchy *Beggiatoa* at 35m compliance points from January – June 2018 is an indicator of a receiving environment which is responsive to organic input, and warrants close investigation and monitoring.
- While it is not possible to predict the magnitude or speed of sediment response to organic inputs at MF266, especially given the complex relationship with harbourwide drivers such as dissolved oxygen, based on visual assessment indicators both internally at June 2018 pre-stock locations and at compliance sites in April/May/June 2018, increased *Beggiatoa* presence and extent is a likely response to the input of organic load to the sediments of MF266. The risk of non-compliances at 35m compliance points within the proposed 2018YC stocking period is considered high, and will need to be monitored and managed.
- The sediments of the proposed NE grid appear to be in better condition than the proposed SW grid with regard to potential assimilative capacity, noting however, the NE grid also has closer proximity to the WHA boundary.
- While there is evidence of some recovery in relation to benthic infauna and sediment chemistry, the level of recovery is difficult to assess, there are still indicators of organic enrichment.

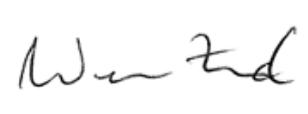
OPTIONS

1. Approve the application to re-stock lease MF266, subject to licence restrictions to limit the area of the lease to the proposed new grids, increase the compliance monitoring to monthly and place a limitation on either biomass or feed input.
2. Approve the application to re-stock lease MF266 without additional restrictions.
3. Refuse to approve the application. The alternate option is for Petuna Aquaculture to stock the harbour by placing the 2018YC on lease MF213, held by Petuna. One of the primary objectives of the joint venture is to provide longer fallowing periods. Should lease MF213 be stocked instead of lease MF266, then it will not be fallowed until around June 2019. Petuna believe fallowing this lease, which was destocked at the end of the previous growing cycle in May 2018, is necessary to reduce the risk of a POMV outbreak on the lease.

The Director's decision is to approve commencement of re-stocking on MF266. Given the previous decision to reduce the biomass to 9500 tonnes, this will reduced the total environmental impact on the harbour and the decision to restock Lease 266 is taken in this context. The following options for management of restocking have been considered:

- Re-stock approval should be limited within specific constraints, for example:
 - only the pen bays within the proposed new grids should be approved for stocking (as defined by the grid boundary corner coordinates in Figure 2). All other areas of the lease to remain under fallow direction. Any additional areas of the lease (including A positions on proposed new grids) would require pre-stocking approval from the Director
 - Stocking approval is only granted for the period 9 July 2018 to 31 May 2019.

- Consider setting a maximum biomass limit of 3000 tonnes for the lease or a total feed input limit of 4500 tonnes over the July 2018 – May 2019 period
- o The partial re-stocking approval (e.g. commencement of stocking on the NE grid only) - however consider possible consequence of this is increased stocking density on the NE grid and increased risk of impact across the WHA boundary. This was not progressed further.
- o Require increased visual monitoring frequency and spatial coverage with tighter reporting timelines, consider ongoing benthic in fauna and sediment chemistry monitoring (or determine triggers for this requirement), consider additional hydrodynamic monitoring and other monitoring to allow validation of depositional modelling and increase understanding of lease response and recovery.



Wes Ford
DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY
16 July 2018