

UNDER the Fast-track Approvals Act 2024 (**Act**)

IN THE MATTER an application for approvals for the Hananui
Aquaculture Project (**Project**) – a listed project
described in Schedule 2 of the Act

BY **NGĀI TAHU SEAFOOD RESOURCES LIMITED**
Applicant

**ADAPTIVE MANAGEMENT APPROACH
SUBMISSIONS OF COUNSEL FOR NGĀI TAHU SEAFOOD RESOURCES
LIMITED**

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MAY IT PLEASE THE PANEL

Introduction

1. These submissions respond to Minute 3 of the Expert Panel dated 1 April 2026.
2. The Panel has asked for legal submissions from the Applicant addressing:
 - a. How the Project relies on an Adaptive Management Approach;
 - b. The existing applicable legal principles relating to the use of adaptive management in the RMA context and whether the FTAA requires any amendments to the application of those principles; and
 - c. How the Project's assessments and conditions have responded to those.
3. In these submissions:
 - a. I begin with some general comments on the extent to which an adaptive management approach forms part of the Project.
 - b. I then provide submissions in some detail on the approach to the use of adaptive management under the RMA. I do this to demonstrate that the approach taken in this Project is consistent with the approach that the Courts have supported in the RMA context.
 - c. I discuss how the purpose and framework of the FTAA extends the Panel's considerations beyond those required by the RMA.
 - d. I conclude with brief submissions on how an adaptive management approach has been woven into the technical assessments and expert recommendations, and the proposed consent conditions.
4. On 8 April 2026 the Panel issued Minute 4 which requests further information from the Applicant in relation to a number of proposed consent conditions, including conditions that address adaptive management. The Applicant is grateful for those questions which provide it an opportunity to provide the Panel with a focussed response to the matters the Panel has identified. A response to Minute 4 is due no later than 22 April 2026. The Applicant anticipates that

its response will include a revised set of proposed conditions that address issues the Panel has identified and provide greater clarity and certainty.

5. The focus of these present submissions is therefore at a more principled level, noting that a more detailed discussion of the most suitable wording of conditions that address adaptive management (amongst other matters) will follow in response to Minute 4.

How the Hananui Aquaculture Project Relies on Adaptive Management

6. The environmental management approaches proposed for the Project have been guided by leading experts, including experts in modelling and marine ecology¹ familiar with best practice in aquaculture and other marine development.
7. Based on that advice, and having consulted extensively with key stakeholders² to ensure the proposed approaches accord with stakeholder expectations, the Applicant has:
 - a. Developed a detailed understanding of the receiving environment in and surrounding the site through multiple benthic (and other) surveys and sampling campaigns over multiple years;
 - b. Sited the proposed farms over areas which are known to comprise sandy habitat so that the primary deposition footprints for farm waste do not comprise sensitive habitat;
 - c. Incorporated into the design of the Project multiple features to avoid or minimise the potential for adverse impacts;
 - d. Undertaken sophisticated modelling of possible impacts of the proposed farms on water quality and the benthic environment, including those areas that contain sensitive biogenic habitat;
 - e. Incorporated into the models the feedback from expert peer reviewers;
 - f. Proposed additional pre-development monitoring to ensure existing environmental conditions (including natural variability) are comprehensively documented to thereby improve the ability of

¹ Including water column and benthic ecology, marine mammals, sharks and seabirds

² Ngāi Tahu ki Murihiku, Environment Southland, Department of Conservation and Ministry for Primary Industries

- future monitoring (once the farms are in operation) to detect any impact attributable to those operations;
- g. Developed a suite of discretionary actions (including such actions as adjusting fallowing periods, adjusting feed inputs, and moving farm locations) that are available to be used to adapt operations in response to any monitoring results that show impacts greater than those expected and that could lead to serious adverse impacts if not addressed;
 - h. Developed appropriate indicators to be monitored in the receiving environment that would trigger a need for a management response well before any impacts from farming become unduly serious or irreversible;
 - i. Proposed a staged approach to farm development, with satisfactory monitoring results from the first stage of development combined with updated modelling showing further development will not give rise to unacceptable impacts being required before the second stage of development can proceed;
 - j. Proposed a condition requiring the farm structures to be removed at the end of the consent term (assuming a replacement consent authorising ongoing occupation was not in place).
8. Some of these responses can be described as incorporating an adaptive management approach. Attached to these submissions as Appendix A is a table prepared by the Applicant's planning consultant Ms Lojkine that identifies and describes the conditions proposed by the Applicant that could be said to form part of an adaptive management regime. As can be seen from the table the Proposal does make some use of adaptive management. In my submission no undue or inappropriate reliance is placed on adaptive management, and the use of this technique (rather than, for example, specifying further management responses that must be deployed if various monitored parameters are met or exceeded) will result in more informed management responses over time, and less prospect that the consent conditions will need to be formally reviewed to address rigid management responses that turn out to be sub-optimal or ineffective. As will become evident when considering the way this proposal uses adaptive management compared with the use of the approach as

considered by the Supreme Court in the *Sustain Our Sounds* decision³, the Hananui Aquaculture Proposal's use of adaptive management is neither excessive nor novel. Within Appendix A Ms Lojkiné has identified in italics various conditions that will be further considered in the Applicant's response to Minute 4.

9. The proposed use of adaptive management will lead to better, not worse, environmental outcomes over time; it is not a 'suck-it-and-see' approach; and it does not reflect any lack of necessary understanding of the receiving environment or the likely impacts of the Project at this stage in the Project's development.

Adaptive Management and the RMA

10. Section 2 of the RMA does not define an adaptive management approach. However, for the purposes of section 165ZFHHA(2) "restrictions on section 128 review of conditions of extended coastal permits", an adaptive management approach is defined as follows:

- (a) means a systematic and iterative process of decision making that aims to reduce and manage uncertainty about the environmental effects of an activity over time through—
 - (i) monitoring the activity and its effects; and
 - (ii) making changes to management in response to the results of that monitoring; and
- (b) can include management by a staged development programme, each stage proceeding only when the monitoring of the biological or physical effects of the previous stage demonstrates that the adverse effects—
 - (i) are within limits prescribed in the provisions of the relevant coastal permit; and
 - (ii) are reversible.

11. The NZCPS, which provides policy direction in order to achieve the sustainable management purpose of the RMA in the coastal environment, does not define or refer to adaptive management.⁴

³ Refer paragraph 19ff below

⁴ The references (or lack thereof) to adaptive management in the RMA and NZCPS can be compared with the position in the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (section 64) and the Natural Environment Bill (clauses 166 and 167 in particular)

12. The Resource Management (National Environmental Standards for Marine Aquaculture) Regulations 2020 (NES-MA)⁵ adopts the same definition of adaptive management as section 165ZFHHA(2) of the RMA.
13. Non-statutory guidance documents prepared by government agencies also provide definitions to which reference can be helpfully made in the RMA context.
14. The Department of Conservation has published an undated guidance note in relation to Policy 3 of the NZCPS.⁶ Policy 3 promotes a precautionary approach to managing activities in the coastal environment that have uncertain but potentially significant adverse effects. The DOC guidance note at pages 7-8 discusses the use of an adaptive management approach as a method to address uncertainty in these situations. The guidance note refers at page 15 to the following definition of adaptive management:

Adaptive management is an experimental approach to management, or “structured learning by doing”. It is based on developing dynamic models that attempt to make predictions or hypotheses about the impacts of alternative management policies. Management learning then proceeds by systematic testing of these models, rather than by random trial and error. Adaptive management is most useful when large complex ecological systems are being managed and management decisions cannot wait for final research results.

15. The above definition is taken from the New Zealand Biodiversity Strategy 2000.⁷ That was a non-statutory document that has now been superseded by Te Mana o Te Taiao: Aotearoa New Zealand Biodiversity Strategy 2020.⁸ The 2020 document does not carry forward the definition of adaptive management.
16. Fisheries New Zealand (a division of the Ministry for Primary Industries) published ‘Best practice guidelines for benthic and water quality monitoring of open ocean finfish culture in New Zealand’ in 2021.⁹ This non-statutory document includes a helpful discussion at section 3.2 on pages 10-12 on enabling effective adaptive management, and in the Glossary at page 64 provides the following definition of adaptive management:

A systematic, iterative process of decision making in the face of uncertainty, with the aim of meeting resource management objectives and reducing uncertainty over time through system monitoring and if

⁵ Resource Management (National Environmental Standards for Marine Aquaculture) Regulations 2020, clause 3

⁶ <https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/coastal-management/guidance/policy-3.pdf>

⁷ <https://www.doc.govt.nz/Documents/conservation/new-zealand-biodiversity-strategy-2000.pdf>

⁸ <https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-2020.pdf>

⁹ <https://www.mpi.govt.nz/dmsdocument/49204-AEBR-278-Best-practice-guidelines-for-benthic-and-water-quality-monitoring-of-open-ocean-finfish-culture-in-New-Zealand>

required adaptation of operational management in response to learning about the system.

17. It can be seen that there is no one, common, definition of adaptive management. I submit that from the different definitions provided, and the discussion of the use of adaptive management in the references provided above, the following propositions about adaptive management can be distilled:

- a. It is a method that addresses the precautionary principle as set out in Policy 3 of the NZCPS.
- b. It warrants consideration when there is scientific uncertainty as to what the environmental effects of an activity might be, and those effects could be significantly adverse.
- c. It is a science-led approach based on responding to observed impacts or trends in environmental data with interventions which are then tested for efficacy and refined or supplemented with other interventions to deliver sustainable impacts that are within established limits.
- d. It is not a 'suck-it-and-see' approach which gives licence for an activity to proceed in the hope that it will not result in significant adverse impacts, and if it does, in the hope that an intervention will be found to manage those impacts down to an acceptable level. In that situation, if significant adverse effects are possible, the precautionary approach will not be met by adaptive management, and an activity may need to be deferred until more certain information is available.
- e. It is more than simply a monitoring and response plan. A management plan that says "if trigger X is observed then action Y must follow" is not an adaptive response, it is simply a pre-determined response if a certain trigger value is met or exceeded. An adaptive management response applies where the complexities and uncertainties in a dynamic system are such that it may not be known what the best response is, or the best series of responses, should trigger X be observed. Instead, by carefully testing responses in an iterative and structured way when trigger X is observed the scientists will, over time, be able to determine and refine the best approach.

- f. In order to ensure an appropriate degree of precaution given the need to test responses should a trigger value be observed, those trigger values must be set at a suitably conservative level to ensure that impacts are addressed before they become overly damaging or in some cases irreversible.
18. Adaptive management is therefore about progressively managing and reducing risk of unacceptable adverse impacts over time in the face of scientific uncertainty. It is a science-led, iterative process with ‘guardrails’ designed to ensure adaptation occurs before and not after significant and irreversible impacts occur.

Sustain Our Sounds

19. The above understanding is in my submission consistent with the approach the Courts have taken. The leading case addressing adaptive management in the RMA context is the decision of the Supreme Court in *Sustain Our Sounds Inc v New Zealand King Salmon Company Limited* [2014] NZSC 40 – an aquaculture case.¹⁰
20. In that case the Court was dealing with an appeal from a first instance decision of a Board of Inquiry (**Board**) on applications for additional salmon farms in parts of Marlborough where aquaculture was already established, and the relevant plan included assessment criteria that needed to be considered, including (in relation to discharges from the proposed farms) “Adaptive management approaches to the management of effects from seabed deposition and changes to water quality”.¹¹
21. The Board had found on the evidence that “the data and information on water quality, that had been presented” is not an “adequate description of the existing environment given the scale of the proposed increase in finfish farming and consequential release of nutrients into the marine environment”.¹² The Board was also critical of the approach taken to the modelling of the effects of the new farms on the basis that it did not consider effects associated with higher levels of feed input that were proposed for later stages of the developments.¹³

¹⁰ *Sustain our Sounds* has subsequently been cited with approval in subsequent cases including *Burgoyne / Te Taumatua o Ngati Kuri Research Unit v Northland Regional Council* [2019] NZEnvC 28, decision upheld on appeal in *Burgoyne v Northland Regional Council* [2020] NZHC 189 although the application of *Sustain Our Sounds* was not challenged, *Hokio Trusts v Manawatu-Wanganui Regional Council* [2016] NZEnvC 185

¹¹ [2014] NZSC 40 at [41]

¹² *Ibid* at [56]

¹³ *Ibid* at [46] and [57]

22. Notwithstanding the difficulties with the application that the Board had identified, the Board granted consents for four new farms that had been applied for, and in doing so placed reliance on adaptive management conditions that formed part of the overall suite of conditions to attach to the various farm consents. As part of the conditions suite the consent holder was required to gather baseline information and compile this in a 'baseline plan' which would be then used to determine whether each marine farm could be safely built and stocked on account of its expected effects. If the baseline plan was not approved by the Council the consent would lapse. The baseline plan would then be used to inform a 'baseline report' which would be prepared by an independent person and would set out the results of monitoring and analysis carried out in accordance with the baseline plan, and would include recommended water quality standards (amongst other matters). Unless and until the baseline report was approved by Council no marine farm development could occur.¹⁴
23. In addition the Board set out numerous conditions that needed to be met once the farms were operational, including conditions requiring detailed monitoring, conditions that had to be satisfied before a farm could increase its feed levels, and conditions requiring remedial action (such as feed input reductions or destocking of farms) if the farms were compromising the benthic environment or water quality¹⁵.
24. Having observed the findings of fact the Board had made (including those referred to above), the Supreme Court then considered whether, as a matter of law, an adaptive management approach was available to the Board. The Court's detailed discussion is found at paragraphs [95] - [140] of the decision.
25. The Court considered the submissions it received from the parties, the precautionary approach as set out in Policy 3 of the NZCPS, the way the Board addressed the precautionary principle and adaptive management in its decision, the Department of Conservation guidance note on Policy 3 of the NZCPS as discussed above, international commentary on the precautionary principle and adaptive management, and relevant decisions of New Zealand, Australian and Canadian courts.

¹⁴ Ibid at [88] – [89]

¹⁵ Ibid at [90] – [93]

26. The Court stated that the lack of baseline information, the lack of modelling of maximum feed levels, and the Board's comment that it would be an ecological disaster if nitrogen introduced into the Marlborough Sounds by the proposed farms resulted in a change in trophic level meant that the qualifying requirements for a precautionary approach were met. Those requirements are uncertainty and potentially significant adverse effects.¹⁶
27. Having traversed this material, including being satisfied that a precautionary approach was required, the Court concluded that the issue to be determined is¹⁷ "...when an adaptive management approach can legitimately be considered a part of a precautionary approach. This involves consideration of the following: what must be present before an adaptive management approach can even be considered [**the threshold question**] and what an adaptive management regime must contain in any particular case before it is legitimate to use such an approach rather than prohibiting the development until further information becomes available [**the substantive requirements**]." (my additions in bold)
28. As to the threshold question the Court held¹⁸ "there must be an adequate evidential foundation to have reasonable assurance that the adaptive management approach will achieve its goals of sufficiently reducing uncertainty and adequately managing any remaining risk."
29. The Court held that the Board clearly had an adequate evidential foundation to answer the threshold question in the affirmative. Adequate modelling of expected water quality at initial maximum feed levels for the farms had been provided, and while the ultimate maximum feed levels applied for had not been modelled, that increased level of feed input could only be achieved under the consent conditions if the water quality and seabed will be protected.¹⁹ The Court further noted that the Board had accepted evidence that the farms were unlikely to affect algal blooms, and that the majority of experts considered a change in the trophic level in the Sounds was unlikely and was dealt with in conditions.²⁰

¹⁶ Ibid at [101]

¹⁷ Ibid at [124]

¹⁸ Ibid at [125]

¹⁹ Ibid at [125] and [126]

²⁰ Ibid at [128]

30. Having satisfied itself that the threshold question was answered in the affirmative the Court went on to consider the substantive requirements for an effective adaptive management or other approach as a means to address the requirements of a precautionary approach, with the alternative option being a prohibition on the farms being developed until further information was available.

31. The Court held that whether an adaptive management approach is appropriate will depend on an assessment of a combination of four factors:²¹

- a. The extent of the environmental risk (including the gravity of the consequences if the risk is realised);
- b. The importance of the activity (which could in some circumstances be an activity it is hoped will protect the environment);
- c. The degree of uncertainty; and
- d. The extent to which an adaptive management approach will sufficiently diminish the risk and the uncertainty.

32. After briefly discussing items a. – c. above in the context of the applications in question the Court then noted that the vital part of the test is d. – the extent to which the adaptive management approach will sufficiently diminish risk and uncertainty. In this context the Court endorsed the four factors the Board had identified:²²

- a. There will be good baseline information about the receiving environment;
- b. The conditions provide for effective monitoring of adverse effects using appropriate indicators;
- c. Thresholds are set to trigger remedial action before the effects become overly damaging; and
- d. Effects that might arise can be remedied before they become irreversible.

²¹ Ibid at [129]

²² Ibid at [133]

33. In relation to the extent of baseline information about the receiving environment the Court noted that the experts agreed there was a lack of baseline water quality information, and that ordinarily one would expect there to be sufficient baseline information before any adaptive management approach could be embarked on. However, the Court accepted that the need to have a baseline report prepared and approved before any physical development took place meant that adequate baseline information about the receiving environment would be available.²³
34. In relation to the need for conditions to provide for effective monitoring of effects using appropriate indicators the Court was satisfied. The Court discussed the use of both qualitative standards (that were set in conditions and were subject to little debate as between the experts) and quantitative standards that would be developed as monitoring occurred and additional understanding of the way the environment was responding to the farm inputs was built up. The Court accepted this approach was appropriate.²⁴
35. In relation to the setting of thresholds to trigger remedial action before adverse effects become overly damaging the Court accepted that the Board's findings that the responses available (either reducing feed or temporarily removing fish until trophic state improved) were appropriate was open to it.²⁵
36. In relation to the ability to remedy effects before they become irreversible the Court found this was implicit from the Board's acceptance that the conditions it set complied with the precautionary approach.²⁶
37. At [139] the Court made the following observation:

The answer to the overall question...of whether risk and uncertainty will be diminished sufficiently for an adaptive management regime to be consistent with a precautionary approach will depend on the extent of risk and uncertainty remaining and the gravity of the consequences if the risk is realised. For example, a small remaining risk of annihilation of an endangered species may mean an adaptive management approach is unavailable. A larger risk of consequences of less gravity may leave room for an adaptive management approach.

²³ Ibid at [135]

²⁴ Ibid at [136]

²⁵ Ibid at [137]

²⁶ Ibid at [138]

38. On the facts as found by the Board, the Supreme Court concluded that it was open to the Board to conclude that the adaptive management regime it had approved was consistent with a proper precautionary approach.

39. The Environment Court in *Wilson v Waikato Regional Council* noted that *Sustain Our Sounds* did not impose “specific requirements” which needed to be met, rather it listed important factors to be considered. The Environment Court said²⁷:

[41] Sustain Our Sounds does not impose “specific requirements” of adaptive management. Rather, it lists factors to be considered when determining whether an adaptive management approach is appropriate. The Supreme Court emphasised the importance of considering risks, but did not direct that a risk elimination or a strict avoidance approach be taken. Nor did it prescribe any benchmark for adaptive management to satisfy a precautionary approach.

[42] As the first interim decision found, in terms of a precautionary approach, it is important to consider both dimensions of risk, namely likelihood and magnitude. [interim decision at [108]]. Focussing unduly on magnitude, as it would appear the appellant has done, leads to impracticable, unduly risk-averse, outcomes not directed by the NZCPS or required by the RMA.

40. *Sustain Our Sounds* was cited with approval by the Supreme Court in *Port Otago Ltd v Environmental Defence Society Inc*. Although the *Port Otago* case was concerned with reconciling the NZCPS and the Proposed Otago Regional Policy Statement, the Supreme Court noted that “*Adaptive management may also have a role to play, again if the effect is to avoid material harm*”²⁸. The Supreme Court went on to discuss *Sustain Our Sounds*²⁹:

[67] In Sustain Our Sounds, this Court held that, before an adaptive management regime can be considered, there must first be an adequate evidential foundation to provide reasonable assurances that an adaptive management approach will achieve the goals of “sufficiently reducing uncertainty and adequately managing any remaining risk”. [Sustain Our Sounds at [125]]. If that threshold question is answered in the affirmative, the overall question is whether any adaptive management regime can be considered consistent with a precautionary approach and this depends on: [At [129] (footnote omitted). The Court at [133] noted that factor (d) was the “vital part of the test” dealing with “the risk and uncertainty and the ability of an adaptive management regime to deal with that risk and uncertainty” and noted four factors appropriate to assess the issue, at least in that particular case.]

“ ... an assessment of a combination of factors:

(a) the extent of the environmental risk (including the gravity of the consequences if the risk is realised);

²⁷ *Wilson v Waikato Regional Council* [2022] NZEnvC 229 at paras [41-42].

²⁸ *Port Otago Ltd v Environmental Defence Society Inc* [2023] NZRMA 422 at para [67]

²⁹ *Port Otago Ltd v Environmental Defence Society Inc* [2023] NZRMA 422 at para [67].

(b) the importance of the activity (which could in some circumstances be an activity it is hoped will protect the environment);
(c) the degree of uncertainty; and
(d) the extent to which an adaptive management approach will sufficiently diminish the risk and the uncertainty.”

41. From the above discussion and the other sources referred to earlier I submit the use of adaptive management under the RMA should adhere to the following principles:

- a. As a response to the precautionary approach, adaptive management can be considered when there is scientific uncertainty as to what the environmental effects of an activity might be, and those effects could be significantly adverse. Scientific uncertainty as to effects on its own is not sufficient to invoke the precautionary approach. There also needs to be a realistic prospect that the effects could be significantly adverse.
- b. Adaptive management should proceed from a sufficient understanding of the receiving environment – the baseline. Normally that baseline information would be available at the time an adaptive management regime is approved, but it is permissible for such a regime to be approved prior to a complete baseline being established, provided there is a process to ensure that baseline is completed before the commencement of activities that might have adverse effects that need to be adaptively managed.
- c. An adaptive management regime should incorporate effective monitoring of the activity and its effects using appropriate indicators to trigger an adaptive response. Appropriate indicators can be qualitative or quantitative, and in complex environments it is permissible (and sometimes necessary) for quantitative indicators that match qualitative indicators to be developed over time as the monitoring of an activity proceeds and a better understanding of the environment and its response to the activity is built up.
- d. Triggers requiring an adaptive response must be set at a level that allows a response after effects are detected, but before those

effects become overly damaging (i.e., adaptive management does not anticipate a 'no effects' scenario).

- e. Where significant adverse effects might be encountered the adaptive regime must ensure they can be remedied before they become irreversible.
- f. The appropriateness of an adaptive management approach is related to an assessment of both risk and uncertainty. Adaptive management may not be appropriate if there is an extremely grave risk such as the risk of a proposed activity causing the annihilation of a species, even if the likelihood of that happening is small. On the other hand adaptive management may be appropriate if there is a less serious risk (such as a discernible impact on the ecological functioning of a small area of biogenic habitat) even if the likelihood of that happening is greater.
- g. Adaptive management is not a 'suck-it-and-see' approach, and a decision maker should have sufficient confidence that the proposed regime can be expected to identify impacts in a timely way and that there are sufficient responses available that can be applied adaptively to respond to an issue before it becomes overly damaging or irreversible.

42. In my submission the Applicant's approach to adaptive management is consistent with these principles. Of note, there is a question as to whether the proposal invokes the precautionary approach on account of the evidence suggesting significantly adverse effects should not occur as a consequence of the development and operation of the farms. Regardless, the Applicant volunteers adaptive management.

43. Further, in no sense does the evidence before the Panel get anywhere near suggesting that there are grave environmental risks associated with the proposal that would warrant considering whether adaptive management is suitable as a way to address any assessed need for a precautionary approach.

I submit that any environmental risks are modest, and cannot count against using adaptive management as a suitable way of addressing precaution.

Does the FTAA require any amendment to the principles that apply in the RMA context?

44. The way adaptive management is described and used in the RMA as a way to address the precautionary approach is grounded in the need to ensure activities achieve the sustainable management purpose of the RMA. In the RMA context, adaptive management is used as a method that can enable activities while ensuring the environmental ‘bottom lines’ in section 5(2) are met. In the coastal marine area these ‘bottom lines’ are given further expression in part through the promotion of the precautionary approach in Policy 3 of the NZCPS.
45. These same considerations are still relevant and must be taken into account by the Panel under the FTAA³⁰.
46. The Panel must consider Policy 3 of the NZCPS, and must turn its mind to whether in the case of the Hananui Aquaculture Proposal the precautionary approach is invoked (i.e., while there is uncertainty, does the weight of evidence support the proposition that potential adverse impacts could be ‘significantly adverse’?). In my submission the combination of existing knowledge and characterisation of the receiving environment, and the modelled nature and extent of effects on the seabed and water column provide evidence upon which the Panel can conclude that significantly adverse impacts are not anticipated, and that therefore the precautionary approach in Policy 3 of the NZCPS is not invoked.
47. If the Panel were to form the view that a precautionary approach *is* required, the adaptive management approach proposed by the Applicant should be considered against the adaptive management principles that are applied in the RMA context as detailed above. This part of the Panel’s assessment is to occur pursuant to clause 17(1)(b) of Schedule 5 and is “uninfluenced” by the purpose of the FTAA, consistent with the approach set out by the Court of Appeal when

³⁰ Schedule 5, clause 17(1)(b) FTAA

considering the hierarchy of considerations in section 34 of the Housing Accords and Special Housing Areas Act 2013.³¹

48. As a preliminary point, the Panel should consider what parts of the Applicant's proposal actually comprise an adaptive management approach as opposed to those parts of the proposal that are better characterised as a 'monitor and respond' approach, including responding in accordance with an appropriate management plan. Appendix A is intended to assist the Panel in this task.
49. If the Panel forms the view that where adaptive management is proposed the approach conforms to the principles and expectations that apply under the RMA, which I submit is the case, no further issues arise, and the Panel can safely rely on the approach that has been advanced.
50. If the Panel was to form the view that a precautionary approach is warranted and that in some material way the adaptive approach, combined with the other detailed conditions the Applicant has proposed, falls short of what would be considered appropriate in an RMA context the Panel would next need to consider the enabling purpose of the FTAA and, in accordance with clause 17(1) of the Fifth Schedule to the FTAA, give more weight to that purpose than to the analysis undertaken pursuant to the RMA's provisions.
51. If the Panel concluded that the adaptive management and other conditions proposed by the Applicant could realistically be anticipated to result in material adverse impacts on the environment that were not appropriately managed (a conclusion which I submit is not supported by the technical information supporting the application), the Panel would ultimately need to undertake a weighing and evaluation exercise under the proportionality test in section 85(3) of the FTAA. That test requires an assessment of the proposal's national and regional benefits and a determination as to whether any realistic adverse impacts are so significant as to be out of proportion to the project's benefits, such that no additional or different conditions or modifications to the project

³¹ *Enterprise Miramar Peninsula Inc v Wellington City Council* [2018] NZCA 541, [2019] 2 NZLR 501 at [52]–[53]. See the discussion of this case and its implications for the assessment of applications under the FTAA at paragraphs 10 and 11 of my submissions dated 17 March 2026 forming part of the Applicant's initial panel briefing.

could be made to reduce the adverse impacts to a level that is acceptable. I submit that such an outcome is implausible.

52. In summary:

- a. The FTAA anticipates that the Panel's analysis of the Applicant's approach to the use of adaptive management should in the first instance be consistent with the analysis that would be undertaken were this an application being considered under the RMA.
- b. In my submission the Applicant's approach conforms to the RMA expectation of what an adaptive management regime should entail and the circumstances in which such an approach is appropriate.
- c. That said (and as discussed elsewhere in these submissions) a precautionary approach may not strictly be invoked in relation to the Hananui Aquaculture Project. While there are inevitably areas of scientific uncertainty (farming in this location is novel which means assessment of likely effects is based on modelling and expert evaluation based on monitoring and observation in other marine environments rather than empirical data from monitoring of actual farming at this location – the experts have gone as far as they can without having actual farming at this location, the effects of which can be monitored) the design and location of the proposal means the assessments do not anticipate significant adverse effects. On that basis the precautionary approach promoted by Policy 3 of the NZCPS is not required.
- d. Notwithstanding this, the Applicant proposes taking a cautious approach and applying an adaptive management regime to ensure that impacts of farm development and operation are closely monitored, and adaptations made if that monitoring indicates important values in the receiving environment are coming under stress as a result of the farming operation.

How the Project's assessments and proposed conditions respond to adaptive management principles

53. Please refer to the table attached as Appendix A which provides a discussion of the proposed conditions that address adaptive management.
54. The conditions are informed by the technical assessments that form part of the application.
55. The principal authors of the technical reports have reviewed and confirmed the proposed conditions as being appropriate as they pertain to their respective fields of expertise. This confirmation can be found in the statements by the report writers at the start of the technical reports. In light of the Panel's questions included with Minute 4 the Applicant will ensure that any changes to the conditions it might propose in response to those questions are reviewed by the relevant experts, and will report on this as part of the response to Minute 4.
56. The Applicant has asked Dr Bennett and Dr McGrath, the principal authors of the Seabed Assessment of Effects and the Seabed Monitoring Report included as Appendix M and Appendix Z respectively of the substantive application, to provide a statement to assist the Panel on the topic of the reversibility of farm-derived effects on seabed habitats. This is a topic that is relevant to the appropriateness of the adaptive management approach proposed by the Applicant and is not directly raised in the Panel's questions included in Minute 4. Dr Bennett and Dr McGrath's statement is attached as Appendix B.
57. In summary their advice is that at the levels of enrichment expected at both sandy and biogenic habitat locations the assimilative capacity of the receiving environments will not be exceeded and as shown by comparable studies elsewhere, if there are impacts in the benthic environment continued progression toward full community re-establishment is achievable. I note that the volunteered consent condition 66 requires that the farms have no adverse effect on the ecological functioning of the biogenic habitat, and that this is consistent with the advice of the experts.

58. For the Panel's convenience, attached as Appendix C is a summary table setting out how the project's assessments and proposed conditions respond to the adaptive management principles described at paragraph 41 above.
59. As noted at paragraph 4 above, the Applicant has now received Minute 4 of the Panel and is in the process of preparing responses to the Panel's questions on conditions as attached to that Minute. Appendix C notes that some of those questions relate to adaptive management conditions, and that these will form part of the Applicant's response to Minute 4.

Dated 10 April 2026



Stephen Christensen

Counsel for Ngāi Tahu Seafood Resources Limited

APPENDIX A

Question 1: How the project relies upon an Adaptive Management approach

Condition	Comment
Condition 27(c) Conditions 80 - 82	Sets out stages, and identifies possibility of an alternative stage (instead of Stage 2) if the Stage Progression Report (Conditions 80 - 82) requires it
Condition 66	Sets narrative limits, defining effects that are not to occur as a result of marine farming <i>[Note that Condition 66 will be further considered in the applicant's response to Minute 4]</i>
Condition 68 and Appendix C	For seabed effects: provide indicative Environmental Quality Zones (areas of the seabed where trigger values would apply) and trigger values (a mix of quantitative and narrative measures that would be used to compare monitoring results against, referred to in the conditions as adaptive management triggers (AMTs)). Triggers are at levels to ensure they act as indicators, well before the narrative limits in Condition 66 would be exceeded. For water column effects: provide indicative triggers to act as indicators to avoid non-compliance with the narrative limits in Condition 66. All water column indicative triggers would be measured at the proposal area boundary. <i>[Note that Condition 68 and the contents of Appendix C will be further considered in the applicant's response to Minute 4]</i>
Conditions 69 - 73	Set out requirements for baseline monitoring. Particularly relevant to adaptive management, Condition 73(e) provides for that baseline monitoring to be used to further assess the suitability of the indicative EQZ and AMTs in Appendix C.
Conditions 74 – 79	Require preparation of an Environmental Monitoring and Management Plan. Particularly relevant to adaptive management: <ul style="list-style-type: none"> • Condition 76(a) requires the EMMP to set out (i.e confirm) the EQZ and AMTs; • Condition 76(b) requires the EMMA to set out adaptive management responses that will be employed by the consent holder to address any exceedances of the AMTs <i>[Note that a further response from the applicant in relation to an adaptive management plan will be provided in response to Minute 4]</i>
Condition 83	Sets out one possible adaptive management response for seabed effects (the relocation of marine farms within the proposal area) and details what would be required in order to allow that response to be implemented.

APPENDIX B

9 April 2026

CAL 2614

PROJECT NUMBER: 19036/12

Thomas Hildebrand
Ngāi Tahu Seafood Resources
PO Box 3787
6 Bolt Place
Christchurch 8053

Reversibility of farm-derived effects on seabed habitats

Dear Thomas

This letter provides supporting technical information for the Hananui Aquaculture Project (Hananui site in Rakiura / Stewart Island) on behalf of Ngāi Tahu Seafood Resources (Ngāi Tahu Seafood), and in response to an inquiry surrounding the reversibility of farm-derived effects on seabed habitats.

Reversibility of effects

At a site like Hananui, which is characterised by high current speeds and a predominantly sandy seabed, enrichment is predicted to be high directly beneath a marine farm, with only very low levels potentially extending to biogenic habitats. Under these conditions, effects are generally expected to be highly reversible, provided enrichment levels remain within those limits. Recovery rates depend on the degree of enrichment, the timing and magnitude of organic inputs, sediment type, hydrodynamic dispersal capacity and the duration of the fallow period (Macleod et al. 2006; Zhulay et al. 2015).

Highly enriched sediments still retain their capacity to assimilate and process organic waste, with benthic communities continuing to support key biogeochemical functions such as organic matter breakdown and nutrient cycling. As enrichment increases to very highly enriched conditions, these processing capacities become increasingly impaired. However, evidence indicates that even these states can be reversed if pressures are reduced, allowing sediment function and community structure to recover over time (Keeley et al. 2014, 2019). Irreversible or persistently degraded states are generally only observed when sediments become excessively or severely enriched, where processing capacity breaks down and natural recovery becomes increasingly limited (Keeley et al. 2015).

The scale and spatial extent of highly enriched conditions are important considerations in assessing the reversibility of effects. At the Hananui site, the area predicted to experience the highest levels of enrichment is small and spatially constrained relative to the overall proposal area. The zone of maximum effect (ZME), defined as areas receiving $> 0.5 \text{ kg}\cdot\text{m}^{-2}\cdot\text{yr}^{-1}$ organic flux, is predicted to extend over approximately 19 ha of sandy seabed, representing around 1.5% of the total proposal area. Due to rotational farming and stocking regimes, the extent of seabed experiencing higher levels of enrichment at any one time is expected to remain limited. Beyond the ZME, predicted deposition rates are substantially lower, and the likelihood of severe or irreversible effects (e.g. collapse of benthic community structure or function) is considered low. The highest probability of more pronounced effects is therefore confined to the ZME. This assessment adopts a precautionary approach, including the use of

reduced iEQS thresholds for measurable effects, such that actual enrichment effects may be less than predicted.

Importantly, in high-flow environments such as the proposal area, excessive accumulation of organic waste on the seabed is unlikely. The coarse sandy sediments found across most of the site are also more readily oxygenated, which may facilitate the decomposition of farm wastes (Martinez-Garcia et al. 2015), further reducing the risk of long-term accumulation.

Effects on biogenic habitats are expected to be minimal, as only very low levels of organic deposition are predicted to reach these areas, and possible influxes will vary over time due to farm management practices (e.g. rotational stocking and production cycles). As a result, not all biogenic habitats are exposed to continuous low-level deposition, even during peak production. This spatial and temporal variation means that exposure of any given biogenic habitat is intermittent rather than persistent.

Farm management practices and recovery

While there is some uncertainty around the ecological consequences of low-level farm inputs, the predicted deposition rates are expected to be well below those associated with lasting change to biogenic habitats, such as the complete structural loss caused by physical disturbances like dredging or trawling. Biogenic habitats around Rakiura / Stewart Island have also demonstrated the capacity to regenerate to full structural complexity over decadal timescales following major disturbance (Batson and Probert 2000), indicating an underlying resilience. Farm-related deposition does not remove or damage the habitat framework; therefore, should effects occur, any recovery is expected to follow normal ecological processes and be far more straightforward than recovery after major physical disturbance.

Ngāi Tahu Seafood has proposed a gradual reduction in feed input to zero over a 6-month period, followed by a 3-month fallow period at the end of each production cycle. Fallowing provides time for sediments near the farms to recover (degree of recovery depends on the duration of the fallow period) before re-stocking, reducing cumulative enrichment effects. Studies from Norway and Aotearoa New Zealand show that seabed recovery beneath salmon farms generally follows a predictable trajectory, with rapid early improvements and longer-term progression towards near-reference conditions. Partial recovery of macrofaunal communities can occur within weeks to months; for example, a 6–8-week fallow period in Norway resulted in measurable improvement, although communities closest to farms remained significantly different from reference sites after 6 months (Zhulay et al. 2015). Similarly, benthic fauna and sediment biogeochemical processes have been observed to return to pre-stocking functional levels within 7 months of farm harvest, while macrofaunal diversity recovered more slowly and remained reduced despite this functional improvement (Keeley et al. 2019).

Despite these observations of early improvement, full seabed recovery in a functional or near-reference sense is likely to require several years (Keeley et al. 2014, 2019). Long-term monitoring in Aotearoa New Zealand at a highly enriched, low-flow site showed substantial improvement in the first 2 years (Keeley et al. 2014), followed by more gradual, variable-dependent recovery over the next 2–3 years. A weight-of-evidence assessment indicated that the site had effectively recovered after 4–5.5 years, with sediment conditions largely comparable to reference sites, although some indicators still differed. While there is limited evidence demonstrating complete recovery of all measured parameters across the full

range of post-farming conditions (e.g. following both cessation and fallowing), no studies have demonstrated complete recovery of all measured parameters. Multiple long-term datasets show that benthic systems can return to a state that is functionally equivalent to reference conditions, with most chemical and biological indicators converging towards background levels. The occurrence of recovery within years rather than decades, even at a severely impacted and poorly flushed site, indicates that salmon-farm effects on the seabed are reversible and that natural recovery processes are robust under appropriate farm management.

A 3-month fallow period is therefore expected to support partial recovery of sediment chemistry and benthic communities and help limit cumulative impacts. Interim monitoring of fallowed or low-production sites will be important for tracking recovery dynamics and improving understanding of temporal responses to enrichment in this area. Fallowing will also reduce the amount of low-level waste reaching nearby biogenic habitats.

Provided the seabed is not pushed beyond its assimilative capacity, continued progression towards full community re-establishment is achievable. This is supported by studies showing substantial biological and geochemical recovery within months and ongoing improvement over multi-year timescales. Accordingly, if farming activity were to cease or relocate, sandy seabed habitats that have experienced higher levels of enrichment would be expected to recover once organic inputs cease. In this context, it is also important to recognise that the ZME comprises a small proportion of the overall Hananui Aquaculture Project area and receiving environment, thereby confining the highest levels of organic enrichment to a constrained spatial footprint. This spatial context is critical in evaluating the scale and significance of effects, indicating a low likelihood of impacts manifesting at broad ecological scales or resulting in system-level degradation.

Yours sincerely

Scientists



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Cawthron Institute



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APPENDIX C

Question 3: How the project's assessments and conditions have responded to those legal principles

Legal principle	Response
As a response to the precautionary approach, adaptive management can be considered when there is scientific uncertainty as to what the environmental effects of an activity might be, and those effects could be significantly adverse.	Hananui Aquaculture Project may not require adaptive management (there is some uncertainty, but significant adverse effects are not anticipated even with that uncertainty)
Adaptive management should proceed from a sufficient understanding of the receiving environment – the baseline.	<p>Good characterisation of the environment at the site is available.</p> <p>Conditions 69 – 73 set out requirement for baseline (pre-development) monitoring <i>[Note a further response on baseline monitoring will be provided as part of the applicant's response to Minute 4]</i></p>
An adaptive management regime should incorporate effective monitoring of the activity and its effects using appropriate indicators to trigger an adaptive response	<p>Conditions 74 – 79 specify development of an EMMP to set out monitoring.</p> <p>Appendix C provides indicative indicators and trigger values, to be confirmed prior to fish being introduced to marine farms <i>[Note a further response on Appendix C and the EMMP conditions will be provided as part of the applicant's response to Minute 4]</i></p>
Triggers requiring an adaptive response must be set at a level that allows a response after effects are detected, but before those effects become overly damaging	Cawthron (Dr Bennett and Dr McGrath) and SLR (Dr Wilson) have confirmed that the indicative trigger levels have been set conservatively, at levels lower than would breach Condition 66
Where significant adverse effects might be encountered the adaptive regime must ensure they can be remedied before they become irreversible.	See material provided as part of the response to Minute 3 from Cawthron
The appropriateness of an adaptive management approach is related to an assessment of both risk and uncertainty.	Hananui Aquaculture Project may not require adaptive management (there is some uncertainty, but significant adverse effects are not anticipated even with that uncertainty)
Adaptive management is not a 'suck-it-and-see' approach, and a decision maker should have sufficient confidence that the proposed regime can be expected to identify impacts in a timely way and that there are sufficient responses available that can be applied adaptively to respond to an issue before it becomes overly damaging or irreversible	<p>See earlier responses re components of adaptive management provided for in the current proposed conditions set and the material provided by Cawthron.</p> <p><i>[Note that a further response from the applicant in relation to an adaptive management plan will be provided in response to Minute 4]</i></p>