



14 May 2020

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To: Nigel Taptiklis (Ministry for the Environment)

CC: Susan Guthrie (Ministry for the Environment)

## Peer review of ‘Essential Freshwater Regulations - Industry Impact Analysis’, 6 May 2020

**This peer review was based on the 6 May 2020 version of the Sapere report. Sapere appear to have addressed our comments in a final version of their report dated 26 May 2020, but we did not have sufficient time to provide a revised peer review.**

### Overall assessment

- The analysis appears reasonable, given the assumptions used. The methodology is well documented, as are the sources of input data.
- It is not clear to us how this analysis will be used by MfE or how it fits in with the Resource Economics report, which covers similar ground. Some discussion of these reports’ similarities and differences would be very helpful. It is currently challenging to compare results across the two studies.
- The paper would be improved with greater discussion of the results. Were they as expected? If not, why not? At present, the report is numbers-heavy and interpretation-light.
- Several results indicate (we think) farmers would have negative costs from implementing mitigation measures. This raises the question as to why they aren’t taking these steps already, and whether they should be included as costs related to the regulations.
- We appreciate this work was completed at pace and under challenging circumstances, given the Covid-19 pandemic and its effects on working arrangements. And of course, there are always resource constraints for consultants – time and money are scarce, and we are not privy to how much of either was available.
- We shape the rest of this review around the two questions we were asked to consider.
- We have also provided a tracked changes version of the draft report containing comments, minor edits and presentational suggestions. This memo summarises the key themes from our review. We would be happy to review any amended final report or talk to the authors.
- Note that we were not asked to review the modelling inputs, nor the assumptions made by consultants or officials.



## Is the approach credible and reasonable given the available information and timeframe constraints?

1. In general, the approach seems credible and reasonable. The report is transparent about the various steps in the methodology. Note our report did not have any Attachment 1, which is where the assumptions for calculating total costs are presented (p.19).
2. However, some comments and omissions in the report warrant further explanation.
3. There is no discussion of counterfactual growth in pastoral land use or intensity of land use over the period to 2050. Is the assumption that current land use patterns persist for the next 30 years? If so, some commentary on how realistic that assumption is would have been helpful.
4. "Achieving optimal Olsen P levels" (s3.4) says there are savings from optimal P management. If there is and if that is effectively a free lunch, should such savings be considered a consequence of regulation limiting N and P loads?
5. A paragraph on the choice of the 3% discount rate would be useful. Is this the same as considered in the Resource Economics analysis? If not, why not, given they cover similar ground? Sensitivity analysis around the discount rate would also be helpful.
6. The following statement (s3.8 p.29) would benefit from greater clarification and justification: "land use change would likely be viewed as a final mitigation used by farmers failing the viability of incorporating other mitigations". It seems to us that the costs of mitigation could be overstated if low profitability farms instead changed land use and delivered large load reductions.
7. The report would benefit from a discussion on the risks associated with using averages around the cost and effectiveness of mitigation. We appreciate the alternative approach of using distributions of costs was likely unrealistic in the time and resources available. But the report should at least flag that the analysis is highly simplified and ignores potentially important relationships (covariances) between mitigation costs, land typology, profitability, and pollutant loads.
8. Some discussion about the extent to which mitigations have increasing/decreasing/constant returns to scale would also be useful, along with commentary on whether the effectiveness of mitigation depends on existing practice (e.g. use of supplementary feed, which might be reduced as a mitigation) and whether existing practices correlate with lower or higher profitability.
9. As we discussed in our review of Resource Economics' cost report it would at least be good to know what sort of averages are used for the average mitigation cost and mitigation effectiveness numbers. Are they weighted averages? What are they weighted by?
10. The analysis assumes capital costs are incurred up front in the first "period" of the policy (p.19, is this the first "year"?). Some discussion about whether that is reasonable would be useful, given policies will be phased and costs incurred incrementally. The same could be said of operating costs which are likely to be phased in. Again, alternative costing approaches may not have been feasible in the timeframe and with the input data available, but the likely implications on the results of the assumed approach should be flagged.



## **Are the conclusions reasonable and consistent with the analysis undertaken?**

11. We have no evidence to think the results are not reasonable or consistent.
12. However, the conclusions are focused almost entirely on the N and P reductions, with no industry cost impacts mentioned at all.
13. The results are presented with little accompanying discussion. This makes it difficult to know whether the authors feel the numbers presented are sensible, align with their expectations, are in line with other similar research, etc.
14. Explaining some of the outlier results in more detail would give the reader confidence that the numbers are reasonable.
15. In Table E6 and E7, the costs for N and P reduction under Scenario 2 are identical at \$9,837,631,381. Is this correct?
16. The profitability numbers in the tables look high at first glance. This may just be because they are NPV values over 30 years. It would pay therefore to note the units used for the tables, to assist the reader's interpretation. This comment applies to many of the tables in the report – what are the changes relative to?
17. There appears to be errors in the columns "Total applicable area (ha)" in "Table 4.6 Regional cost distribution under lowest cost mitigation bundles for N" (p.38). The total ha of land area of NZ is only about 26-27 million hectares, whereas Table 4.6 reports a figure of 17.1 billion ha. Table 4.10 (p.41) appears to have much more reasonable/likely numbers. However, the error in Table 4.6 is repeated in Table 4.13 (p.44), Table 4.2 (p.50), and Table 4.23 (p.53). The errors in the tables appear to be presentational only i.e. they do not seem to have affected the calculations of costs.