

04 June 2019

Mark Preece
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Picton, 7220
(cc Marlborough District Council)

ID:1932

Dear Mark

Assessment of enrichment levels at the outer limit of effects

We are pleased to provide you with the 2018 annual monitoring reports for the Waitata Reach and Ngamahau Bay salmon farms. As you are aware, consent conditions required a review of the EQS compliance zone dimensions and monitoring stations at these salmon farms during this monitoring round. To do this, we employed a footprint mapping exercise which required additional sampling beyond the outer limit of effects. Interpretation of these results highlighted some ambiguity in the Environmental Quality Standards (EQS) for the outer limit of effects (OLE) as set out in the Best Management Practice (BMP) guidelines and consents for both sites:

- **Under the BMP guidelines**, the industry operational goal is for the OLE to be $ES < 3.0$, and natural conditions are to be maintained. Importantly, background conditions are assessed as Enrichment Stage (rather than individual variables).
- **The consents** require that $ES < 3.0$ is maintained at the OLE, and that conditions remain statistically comparable with relevant / appropriate reference stations.

In the context of the consent, it is not clear if the intent is to measure conditions as ES, or as individual variables¹.

When we analysed individual enrichment indicator variables, farm-related enrichment effects (elevated total free sulphides and macrofaunal abundance) were observed beyond the OLE at both the Waitata and Ngamahau farm sites. Accordingly, natural conditions have not been maintained. On the other hand, analysing only ES scores, the depositional footprints were compliant with the EQS specified in both the BMP and the consent; i.e. $ES < 3.0$ and ES is statistically comparable with relevant / appropriate reference stations. See for example, Table 1 on p 4 of the Ngamahau report and footnote 2.

In addition, we note that background ES scores for both the Pelorus Sound and Tory Channel² ranged from 1.0 to 2.6. Therefore, using $ES < 3.0$ as an indicator of 'natural conditions' implies that a degree of enrichment outside of the consented OLE is acceptable under both the BMP, and the consent. If the objective is to maintain true background conditions, and ES is to be the measure of background conditions, then we recommend

¹ We note that the Peer Review Panel agree that conditions at the OLE are to be measured as overall ES rather than individual variables.

² i.e. as measured at reference stations during this monitoring round and during baseline surveys.

consideration is given to using region-specific ES values as reference for background conditions (rather than ES3.0 which implies that increased enrichment is allowed, outside the primary footprint).

We suggest clarification is sought from the benthic standards working group as to whether ES 3.0 is an acceptable measure of natural conditions at all sites.

Please do not hesitate to contact me if further discussion required in the meantime.

Yours sincerely

Scientist



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Reviewed by



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