



Te Taiao Tonga

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## Technical comment

**To:** Ryan Hodgson

**From:** Katie Blakemore, Senior Scientist – Surface Water Quality

**Date:** 28 April 2023

**File Reference:** REQ-21237156 & APP-20232970

**Subject:** Request for technical comment

Does rule 1 or 2 apply in the RWP? (surface water bodies that meets/does not meet water quality standards).

- See below as the assessment as Appendix G of the RWP has the same content as Appendix E of the pSWLP.
- **Does Policy 15A or 15B apply in the pSWLP? (water quality standards are met/not met).**
  - Faecal coliforms are the most likely parameter to not meet the water quality standard in Appendix E. E. coli is a component of the total faecal coliforms and therefore faecal coliform concentrations would be expected to be higher than these values, using the E. coli values provided by the applicant.
  - Data provided by the applicant shows that both upstream and downstream E. coli concentrations exceeds 1000 mpn/100mL periodically.
  - The data provided by the applicant shows a median E. coli of 575 mpn/100mL and mean E.coli of 1521 mpn/100mL upstream of the discharge.
  - The metric used will determine whether the water quality standards are met.
  - I am unclear how the Appendix E standards were designed to be applied. Reading that ‘the concentration of faecal coliforms should not exceed 1000 coliforms per 100 millilitres,...’ seems to imply that this should be the case at all times. In this case the water quality standard is not met due to the periodic exceedances.
  - However, the concentrations could be expected to vary in relation to factors such as river flow.
  - Using the median would be consistent with the NPS-FM, although this is used in addition to the 95<sup>th</sup> percentile and the proportion of the time that threshold values are exceeded, and as such can be more precautionary than simply using the median to assess this.
  - The nearest upstream SOE monitoring site is Mataura River 200m d/s Mataura Bridge. This site is in the E band for E.coli under the national objectives framework.
  - Water clarity and deposited sediment are not able to be assessed for the reach in question in relation to the water quality standards on the basis of the provided information or from Council’s environmental monitoring data.

- **Is the water quality data provided in the application still applicable or is it now out of date and no longer relevant to current water quality standards? Please explain why or why not.**
  - The water quality data provided is applicable, however the upstream data provided is within the mixing zone of another consented discharge.
  - It may be of benefit to the applicant to provide data from further upstream if available. Specifically, it may be worthwhile assessing whether the water quality standards are met upstream of that mixing zone to see whether policy 15A or 15B (or rule 1 or 2) applies.
  
- **Should the applicant provide new water quality monitoring data to show how it meets current up to date water quality standards? Please explain**
  - It may be beneficial for the applicant to provide water clarity data, however given that the TSS limit is complied with and the upstream is also within a mixing zone this is not essential.
  
- **If new water quality monitoring data is required, please explain how the sampling should be conducted.**
  - Clarity should be assessed using black disc or clarity tube
  
- **I see the definition of a reasonable mixing zone in the pSWLP sets a maximum mixing zone of 200m. What is the appropriate mixing zone that should apply for this application given the Fonterra discharge is only 200m upstream of the bridge (with a current mixing zone of 400m), and whether it is preferable to maintain the historic mixing zone of 425m? Please provide explanations.**
  - The maximum mixing zone specified in the pSWLP will have been set as a result of a range of factors, including scientific rationale. As the rationale for this would not be based entirely on the science, a decision to allow a mixing zone greater than permitted by the pSWLP should not be solely a scientific decision.
  - The consent holder has not presented any justification as to why it is appropriate to retain the mixing zone of 425m.
  - Therefore, there is no evidence to justify why the mixing zone should not be reduced to 200m in keeping with the pSWLP.
  
- **Is the proposed discharge, and the increase in the discharge volume, a concern? Please explain why or why not.**
  - The increase in consented average daily volume is a significant increase of approximately 70%. However, the daily volumes have been in excess of those consented for several years and based on 2019-2022 daily volumes provided, the increase is approximately 7%.
  - The consented maximum daily volume would increase by approximately 33%, however based on the data provided the actual increase would be approximately 7%.
  - Based on the consented discharge limits the increase appears substantial, however the actual increase that would be permitted under the new volumes is much less.
  - The discharge and receiving water standards have generally been met, despite the volumes being in excess of consented limits. There have been occasional exceedances of the consented limits for E.coli and DRP, but on the basis of a single sample rather than an average.
  - Provided that the discharge and receiving water standards continue to be met, the increase in discharge volume is not a significant concern, especially given that the limit for E. coli in the discharge is proposed to reduce.

- If possible the applicant should provide information on the expected frequency of the exceedances based on the increased volumes, and/or any mitigations that could be used to reduce these instances, for both E. coli and DRP which periodically show higher values.
- **Is the assessment of effects provided on page 40 to 45 (of the pdf) adequate? What further information is required?**
  - How has the applicant determined that the water quality standards are met (and therefore that Policy 15A is applicable)? Specifically this needs to be addressed in relation to the E.coli data presented in appendix B.
  - No assessment of water quality in relation to the National Objectives Framework has been made. This would be particularly relevant for E.coli, DRP, ammonia and nitrate. The macroinvertebrate monitoring could also be used in this context. While the frequency of monitoring would be insufficient for a fully robust assessment, an indication could be provided.
  - Paragraph 2 of section 5.2.1 – I question the statement that the discharge complies with the water quality standards. While the contribution of the discharge may be relatively small, it is unclear whether the water quality standards are met upstream or downstream of the discharge and therefore further consideration of reductions in the loads from this discharge is warranted.
  - The paragraph referenced above states that contaminant concentrations and loadings show no obvious change. Contaminant loadings have not been presented in the AEE.
  - It would be helpful for the E coli loads to be provided, in addition to the concentrations.
  - Section 5.2.4 discusses potential effects on instream ecology and aquatic organisms.
  - This section also identifies relevant water quality issues in the receiving environment, but does not link this to the potential effects on instream ecology and aquatic organisms. Potential and actual effects are not discussed, and it would be relevant to state any outcomes of the periphyton and macroinvertebrate monitoring to date.
  - Please provide the most recent periphyton and macroinvertebrate monitoring data, as no results are presented in Appendix B.
  - Additionally, on pages 27-30 of the PDF, discharge quality data is presented graphically. As the consent condition is based on the mean of 4 samples, it would be helpful for the applicant to present a rolling mean in addition to the actual values.
- **Are the proposed draft conditions on page 33 to 38 (of the pdf) adequate? Are there any additional requirements that you would recommend? and why?**
  - I note that the discharge is tested for total phosphorus, but not the receiving environment. Consideration for inclusion of TP in the receiving environment testing could be beneficial, but is likely to be of less concern than the E.coli and nitrogen concentrations.
  - Note that the mixing zone in condition 7b states 425m, not 200m (and condition 13 advice note the same). This may need to be altered to be consistent with the 200m mixing zone discussed above.
  - Condition 13c i – may need to be altered to be consistent with the water quality standards in Appendix G of the RWP and Appendix E of the pSLWP, where only 1°C increase is permissible when the river temp is above 16°C?

- Condition 13 c viii – While this aligns with the water quality standards, it may need to be considered in relation to the *E. coli* data, which shows that the water quality standard is not met, and this condition may therefore not be achievable for the applicant. There should also be consideration of whether this should specify faecal coliforms or *E. coli*. I would suggest that although the water quality standards relate to faecal coliforms, *E. coli* is currently monitored and is arguably the more relevant measure as it is specified in the NOF.
- Therefore I would suggest consideration of amending condition 13 c viii to something along the lines of:  
“The concentration of faecal coliforms should not increase by more than XX(%)”

### Update – Further Information Received 17 July 2023

- Although the information provided regarding the macroinvertebrate results does not include calculation of the MCI, this could be calculated from the information supplied. The results show that MCI would be above National Bottom Line and would comply with the Appendix E water quality standard.
- Although the relevant standards are complied with, I would suggest that the renewed consent should include a condition specifying that both MCI, QMCI are calculated from the results of the macroinvertebrate survey. Also consider specifying that the ASPM (NOF attribute) is to be calculated
- Consider whether the applicant also needs to measure clarity (black disc) in the receiving environment. This would relate to the suspended sediment NOF attribute and would enable this to be assessed in future.
- Although the Appendix E and Mataura WCO have limits on faecal coliforms, the NOF attribute relates to *E. coli* and the applicant is measuring *E. coli* in the discharge and receiving environment. I would recommend that *E. coli* continues to be measured.
- *E. coli* is a subset of the faecal coliforms. Therefore if measured *E. coli* exceeds the water quality limit for faecal coliforms it is certain that this limit is exceeded. Faecal coliforms at the upstream SOE site exceed the Appendix E standard of 1000 CFU/100mL (July 2017 to June 2022; median 1200 CFU/100mL; mean 4490 CFU/100mL).