

Date: 13.11.19

To: Rebecca Jackson

New Beaumont Bridge -Ecology AEE (revised)

Dear Rebecca,

This memorandum constitutes a final assessment of the Beaumont Bridge – Ecology AEE which has been revised from the initial assessment.

1.1 Context

The NZ Transport Agency (NZTA) propose to replace the historic bridge over the Clutha River/Mata Au at Beaumont with a new 200m long bridge. Ryder consulting have prepared an assessment of ecological effects on behalf of NZTA.

This memo is a final assessment review of the Ryders AEE and the aquatic ecological components of the overall application.

1.2 Description of the environment

The Ryders report is a thorough assessment of the ecological values of the Clutha River/Mata Au at Beaumont, the potential impacts of the proposed activities and the efficacy of potential mitigations.

The Ryders report describes the impacts of flow fluctuations and the varial zone on ecological values and I agree with this assessment. However, while varial zones and hydro-peaking do have negative impacts of ecological values it is apparent from macroinvertebrate data collected from the Clutha River/Mata Au that ecological values are somewhat resilient to this impact. As such I do not believe that the occurrence of a varial zone should in any way reduce the onus on the applicant to mitigate potential impacts of the activity to the greatest extent practical.

Water quality in the Clutha River/Mata Au is described in the Ryders report and repeated in the overall application. Water quality is typically good and compliant with the appropriate regional plan. Few of the water quality parameters monitored in the river are likely to be impacted by the proposed activities with the exception of water clarity and turbidity.

Clutha River/Mata Au at Beaumont has been colonised by the introduced nuisance algae *Didymosphenia geminata*. This bloom forming algae is known to have deleterious effects on invertebrate and fish life in rivers and streams.

Fish populations in the Clutha River/Mata Au at Beaumont are reviewed as well as the regional value of the sports fishery. However, there is little discussion of the potential for fish spawning in the Clutha River/Mata Au at Beaumont. Salmonids and some native fish spawn in freshwater and the potential location and timing of these spawning events should be considered. In addition, some discussion of the potential for the presence of threatened macroinvertebrates, such as freshwater crayfish or mussels, would be valuable.

1.3 Assessment of effects

The Ryders report make a thorough assessment of effects;

Disturbance to the bed is not considered to be a likely cause of negative impacts to aquatic life. I agree with this conclusion given the brief and localised extent of the activity, rather than the already degraded state of communities due to the varial zone. Neither the extent of the varial zone or its ecological values have not been assessed. Furthermore, there will be works in the bed beyond the varial zone that may impact upon aquatic life and as such these activities should be carried out with minimal disturbance to water quality and habitat.

Temporary structures will be required for the construction of the bridge. I agree that these structures are likely to have limited impact on ecological communities provided proposed mitigations are followed. In particular fish salvage is an important undertaking when diverting flow from or dewatering an area of riverbed (Burrell & Gray 2017).

Sediment discharges may have significant impacts on aquatic fauna as discussed by the Ryders report. I agree with the report's conclusion with regard to the large volume of the river and localised scale of the potential discharge. Provided that all practical steps are taken to minimise sediment discharges there is unlikely to be any discernible effect or requirement for monitoring. But this conclusion is dependant on an adherence to best practise during the construction phase as described in the Ryders report.

Concrete related discharges may have a significant impact on aquatic life and there is no apparent reason why concrete residues may not be kept out of the river and shallow groundwater at all times. Accordingly, I agree with the Ryders report in that all steps should be taken to prevent any discharge. As such, I am concerned about the potential for a discharge during the construction of bridge piers into bedrock mid-river using the tremie method (page 19; final for lodgement). How will the applicant ensure that there is no concrete discharge to the river or shallow groundwater beneath the river? The overall AEE proposes having an emergency concrete spill contingency plan. However, there is little that can be achieved once concrete has entered the river.

Other contaminants, including stormwater from the road post construction, can all be managed using standard best practise methodologies. I agree with the conclusions in the AEE on this point.

1.4 Summary of requested further information

In summary I believe that, with the proposed mitigations in place, there are likely to be no or limited environmental impacts on aquatic fauna from this proposed activity. However, I think that clear requirements around fish salvage, minimising sediment discharges and the avoidance of a concrete discharge are important components of the consent conditions. I believe that the

Ryders report should make comment on the likelihood of fish spawning in the affected reach and the potential implications for the timing of certain activities. However, given the brief duration and localised scale of the activity, fish spawning may not necessarily alter project logistics.

The recommendations of Ryders and my own concerns are mostly addressed in the overall AEE. However, I do believe it is important for an ecologist to be in regular contact with site management particularly during any dewatering, diversion, concrete injection or general works in the bed of the river. Table 1 lists the topics for a further information request.

Table 1. Request for further information topics.

Topic	Detail
Fish spawning	Discuss potential for native or exotic fish to be spawning in the affected reach, potential impacts of project and mitigations if required.
Mussels and crayfish	Discuss potential for freshwater mussels or crayfish to be present, potential impacts of project and mitigations if required
Concrete discharge	Request detail on how the project will ensure the complete avoidance of a concrete discharge to the river
Fish salvage	Request further detail on fish salvage methods
On-site/call ecologist	Request further detail about the arrangements to have ready ecological advice/oversight at key points in the project

1.5 S92 response and final assessment

1.5.1 Fish spawning

I agree with the comments made by Ryder consulting and feel that the recommendations regarding the timing of works should be incorporated into the consent conditions. Ryders do not comment on the potential for native fish to be spawning within the affected reach of the river which I believe is an oversight despite the area not being listed in the Otago Regional Plan. However, consent conditions which focus on sediment and erosion control and the large size of the river will likely prevent significant impacts arising from this project. I do not require any further information on this topic.

1.5.2 Mussels and crayfish

The comments by Ryders on this topic are reasonable. While I believe both mussels and crayfish inhabit a far broader range of habitats than just forested streams the conditions describe in the affected river reach would not appear conducive to these species. It would certainly be challenging to confirm. I do not require any further information on this topic.

1.5.3 Concrete discharges

The comments by Ryders match those made in the AEE and provided that the approach is successful there will be minimal impacts on aquatic fauna. However, the risk of a discharge remains considerable and should be prevented.

I do not require any further information on this topic.

1.5.4 On site requirements

The Ryders response states that they will be available, however this does not necessarily mean that they will be called upon at the appropriate times. As a consultancy Ryders will always have staff available, that is their business, but they must first be procured by a client.

How and when will the applicant procure input from their ecologist to inform their activities?

1.5.5 Fish salvage

Ryders are a suitable company to undertake fish salvage. But there needs to be appropriate wording in consent condition to ensure that they are used for this purpose. Any de-watering which occurs at the site should be accompanied by a fish salvage operation.

I do not require any further information on this topic.

1.6 Conclusion

Overall, I feel the S92 response for Ryders is adequate. However, the applicant may need to alter their proposed conditions to fully incorporate this advice. In particular, how will they communicate with their ecologist to ensure that mitigations are an integral part of the work program rather than an *ad hoc* arrangement.

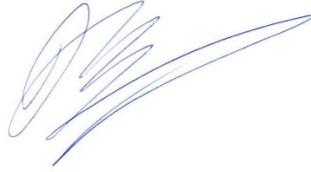
Yours sincerely

Duncan Gray

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References

Burrell G, Gray D. 2017. Fish salvage guidance for works in waterways. Prepared by the Christchurch City Council and Canterbury Regional Council. p7.