MT MESSENGER BYPASS PROJECT: SUMMARY OF EVIDENCE OF MARTIN WILLIAM NEALE (FRESHWATER ECOLOGY) FOR THE NZ TRANSPORT AGENCY

1. I was engaged to peer review the Freshwater Ecology aspects of the Project in June 2018. I had no involvement with the project prior to this time. I have since been requested to provide evidence on behalf of the Project.

2. In this capacity I reviewed the freshwater assessment reports completed for the AEE ("Freshwater Ecology Report" and "Freshwater Ecology Addendum"), the relevant chapters of the Ecology and Landscape Management Plan and evidence prepared for the hearing by Keith Hamill (for the Transport Agency) and Dr Thomas Drinan (for DOC).

Initial Review (at time of evidence in chief – 25 May 2018)

3. At this time the documents I reviewed contained a comprehensive assessment of the freshwater resources in the Project area. Given the complexity of the Project and the uncertainty in Project footprint at that time, the work provided an appropriate assessment of the potential effects of the Project and outlined a package of proposed mitigation and offsets that should effectively manage the effects of the Project.

4. In my opinion, the assessment to assess and manage the freshwater effects of the Project was generally appropriate, but I did identify a small number of issues that required clarification or amendment to better manage the environmental effects. The most important of these were:

    a) SEV values provided to some culverts required modification to account for fish passage issues.

    b) The application of the SEV and ECR tools to stream diversion required clarification about the value of the ECR.

    c) The stream lengths to be directly affected by the Project were inconsistent in some of the project documentation.

Commentary on updated freshwater assessment – 17 July 2018

5. Following my initial review, there were a number of changes in the freshwater assessment that were described primarily in the supplementary evidence of Mr Hamill. I supported these changes, which include:

    a) Removal of the need for two culverts.

    b) Reducing culvert gradients, increasing culvert diameters and increasing culvert embeddedness.

c) Revision of SEV scores assigned to some culverts.

d) Increase in monitoring efforts to assess the effects of the Project.

Overall comments on proposed offsetting package

6. In my experience, there is a high-level aspect of the offsetting package that is unusual for a development project and offers some benefits that are not fully captured within the SEV/ECR framework. That the proposed offsetting streams are all downstream of high quality streams with largely native forest catchments means the benefits of the restoration activity are far more certain to accrue.

7. The benefit of stream restoration in areas downstream of native forest has been demonstrated to result in greater responses in fish and invertebrate communities. This is a key factor in my opinion that the freshwater offset package should provide a net improvement in ecological functioning in the medium to long term.

8. I produced a statement of evidence summarising my review on the 17 July 2018.

Response to Department of Conservation freshwater evidence

9. Dr Thomas Drinan provided a statement of evidence on behalf of the Director-General of Conservation on 24 July 2018. I have drafted a rebuttal statement in response to some of the issues raised by Dr Drinan in his evidence. This rebuttal covers three key areas.

Stream values and proposed mitigation

10. Whilst there is a degree of agreement about the relatively high values of the freshwater resources within the project area, there remains some technical points of disagreement amongst the freshwater experts. These points relate to how the values of the streams are assessed and the manner in which the SEV and ECR tools are utilised for this project. I support the approach taken by Mr Hamill when using the SEV and ECR tools, and explain my reasoning in terms of the two major points of disagreement below.

Values of culverts

11. Mr Hamill has assigned SEV scores in the ECR analysis to allow the calculation of the required quantum of mitigation required to offset the Project's impacts. Dr Drinan disagrees with these values and recommends that culverts are given no value in the ECR calculations. I prefer Mr Hamill's approach, as the scientific evidence indicates culverts do have functional and biodiversity values. In addition, one of the key

concerns of Mr Drinan (food web effects) is likely to be of low importance in the small forested streams affected by the Project.

Importance of headwaters

12. Again, there appears to be general agreement among the freshwater experts that headwaters are important to the ecology of stream systems. Mr Hamill has accounted for headwaters streams in his assessment by treating them in the same way as non-headwaters, effectively assigning equal values to headwater and non-headwater streams. In contrast, Dr Drinan suggests that headwater streams are more important and recommends that they are given greater weighting in the assessment. Again, I prefer Mr Hamill's approach on this issue as the scientific evidence indicates that headwaters have similar functional and biodiversity values as non-headwater streams. In addition, Dr Drinan relies on a study with a methodology heavily biased towards an outcome that would place greater value on headwater streams.

Overall conclusions

13. Overall, the documents I have reviewed contain a comprehensive assessment of the freshwater resources in the Project area using a range of appropriate techniques. The freshwater resources in the Project area are generally of high quality.

14. Recognising this is a complicated project, with some residual uncertainty about the footprint, the work provides an appropriate assessment of the potential effects of the Project on these freshwater resources. I support the transparent approach taken in Mr Hamill's assessment, which describes all of the potential effects, identifies which of those can be managed through mitigation and describes those effects that require environmental compensation.

15. The proposed package of mitigation and offsets has been informed by the application of the SEV and ECR tools, which indicates a quantum of stream restoration to offset impacts of 8,455m. In addition, that the stream restoration is to be carried out downstream of native forest catchments means the benefits of the restoration are a far more certain to accrue. When these additional benefits are factored into an overall assessment, it gives me confidence that the freshwater mitigation and offset package should provide a net improvement in ecological functioning in the medium to long term.