MT MESSENGER BYPASS PROJECT: SUMMARY OF EVIDENCE GRAEME JOHN RIDLEY (CONSTRUCTION WATER MANAGEMENT) FOR THE NZ TRANSPORT AGENCY

Process and project

1. Along with my colleague Sharon Parackal, I prepared the CWAR for the Project. I was also part of the MCA process for the Project where specific construction water management issues formed part of the overall route selection options assessment.

2. I am familiar with the Project site and the existing SH3 alignment. As part of the CWAR development I have visited the site including with staff and representatives of TRC and also the Department of Conservation. The Project is approximately 6km in length, with an earthworks volume of approximately 890,000m^3 over a total area of approximately 36ha including the early stages of works. Importantly, this Project is not large from an earthworks area perspective and is representative of a small to medium earthworks project.

Overall conclusions

3. As stated in my rebuttal evidence, in my opinion the construction water management plan framework and monitoring programme for the Project are robust. Together they represent a thorough and appropriate approach to construction water management on the Project.

4. I consider that Mr Duirs is overstating the erosion and sedimentation risks associated with the Project, and I do not think he provides a balanced view with respect to the overall approach that will be applied.

5. Finally, I confirm that while the Project has recognised risks, these risks are clearly identified and accounted for within the approach taken (including through best practice construction water management, and a robust and full monitoring regime). I do not consider this Project is a particularly 'risky' one in construction water terms. Overall, I reiterate my opinion that the erosion and sedimentation effects of the Project will be negligible.

Background water quality and the earthworks in context

6. Water quality was observed during site visits to the Project site where deposited sediment was observed at the banks and base of the Mangapepeke Stream, and also in the Mimi wetland. It is assessed that during periods of rainfall, water quality declines within the upper stream catchments due to increased suspended sediment loads from natural erosion of the stream beds and banks and some erosion of the surrounding soft papa mudstone including stock and pest induced erosion. Water quality baseline monitoring commenced in November 2017. When considering wider catchment and

marine environments and assuming the full potential earthworks area is open at any one time (very unlikely to occur), back calculating potential sediment yield (for an annual event calculated from other projects) with the flows for the Tongaporutu Catchment this equates to an increase in sediment concentration of approximately 0.68 g/m^3 in the river flows at that point. For the Mimi Catchment, this equates to an increase in sediment concentration of approximately 0.66 g/m^3 in the river flows at that point. Both of these increases in sediment concentration are considered negligible and any resulting increase in total sediment concentration from expected background is unlikely and unable to be detected.

Earthworks

7. On a catchment basis the Project earthworks equate to 7.4% of the total area immediately upstream of the Project in the Tongaporutu Catchment and 1.2% of the total area immediately upstream of the Project in the Mimi Catchment. The earthworks themselves will be undertaken in various stages in a lineal fashion for the main alignment in addition to spoil stockpile locations. The risk from the earthworks themselves can be reduced by progressively stabilising as works proceed and implementing best practice erosion and sediment controls including by reducing slope length as much as practically possible through the provision of contour drains across cut slopes while earthworks are occurring.

8. With respect to progressive stabilisation, this is reflected within the requirement that exposed areas (not actively worked) cannot be left exposed for more than 14 days.

9. Calculated annual sediment yields compared to potential background yields for the Project and catchment areas confirm the potential of 0.7% increase in sediment yield for the Tongaporutu catchment and a 0.5% increase in yield for the Mimi catchment. On a sub-catchment basis, this equates to less than 8% annual increase for the Mimi catchment, and a 46% annual increase for the Mangapepeke catchment.

CWMP and SCWMP

10. The CWMP has been developed and finalised to provide the overall approach and guidance for construction water management during construction of the Project. The CWMP will be a live document that will be reviewed and updated, if necessary, during the course of the Project. For each area of work, prior to construction activity, detailed location and/or activity Specific Construction Water Management Plans (SCWMPs) are required.

11. While it is recognised that the development of SCWMP's will be ongoing throughout the Project, three SCWMPs have been prepared in accordance with the principles of both the CWAR and the CWMP including the SCWMP template that forms part of the

CWMP. These SCWMPs form part of the condition and management plan suite to be approved by the Hearing Commissioner.

Construction Water Monitoring

15. The two overall objectives of the construction monitoring programme have been confirmed in discussions with TRC and DOC, and further reinforced within the updated CWDMP.[1] These two overall objectives are:

    (a) to provide information for making effective on-site decisions on necessary continuous improvement of erosion and sediment control measures (both structural and non-structural); and

    (b) to assist in understanding the outcome of on-site decisions for water quality and stream ecology, and support any determination of potential ecological effects from sediment discharged by the Project earthworks.

16. A detailed CWDMP is considered critical to the success of the Project and is appended to the CWMP. Without such a monitoring programme, the ability to successfully implement effective erosion and sediment controls that respond to the Project constraints and improve the water management control measures and the overall management approach as required, will be greatly reduced.

17. The monitoring programme will involve ongoing site monitoring throughout the construction phase to check that construction water management measures have been installed correctly, and methodologies are being followed and are functioning effectively.

18. The Construction Water Discharges Monitoring Programme includes the following components:

    (a) Receiving environment: on-site visual assessments;

    (b) Weather forecasting during Project implementation;

    (c) On-site monitoring of water management devices;

    (d) Flocculation monitoring; and

    (e) Quantitative sediment discharge monitoring.

19. Following the comments and recommendations received from TRC and DOC, the updated CWDMP now also includes a requirement for continuous turbidity sampling at downstream locations from the Project earthworks. This allows a pre-construction

[1] These objectives are discussed in paragraph 118 of my EIC. The updated CWDMP is Attachment C to the updated CWMP attached to Mr Roan's supplementary evidence.

baseline to be determined, and will also allow turbidity levels to be continuously recorded during construction activities.

20. The CWDMP will be required to be reviewed every three months during the first 12 months of construction, followed by an annual review thereafter. This review provision is intended to provide for adaptive management and continuous improvement, and provides further significant confidence that the CWDMP can be adjusted if necessary.

21. DOC have raised a concern related to the earthworks activities to occur in both Fill 12 and 13. To assist with the management of this risk, we have also introduced a more site focused monitoring programme for these locations. This is in addition to the wider CWDMP that applies, and includes specific ecological monitoring (of both fish and invertebrate species and diversity) immediately downstream from these locations.

22. The cautious construction methodologies proposed for these fill sites,[2] the CWDMP and the fill specific monitoring programme, mean that any effects of construction related water discharges will be managed effectively with full knowledge of outcomes.

Winter Works

23. Both TRC and DOC have sought clarification on the process associated with winter work activities that will occur with the Project, and the involvement of TRC in certification of these works. I confirm that the use of SCWMPs continues to be an appropriate tool for this purpose. It allows for consideration of specific locations of works, while also allowing for a Project wide consideration when determining what these works will entail. In addition, the CWDMP provides comfort that any issues that arise during construction will be identified early and addressed accordingly.

24. I understand that TRC now accepts that the SCWMPs are an appropriate tool for confirming winter work activities[3], but remain concerned with respect to its ability to certify such works. For the avoidance of any doubt, in updating the CWMP I have now incorporated clear statements to this effect, including noting that winter works cannot proceed without certification.

Response to submissions and the TRC Section 42A Report

25. In simple terms, I consider the construction water management-related issues raised in the submissions to be addressed appropriately in the CWMP and SCWMPs (including the CWDMP) for the Project. I note in particular the ongoing discussions with TRC and DOC and the proposed water management process and methodologies that will apply.

[2] In particular, the ability to progress these works on a step by step basis with small incremental daily installation of diversion pipes, daily stabilisation, and progressive filling as works progress.
[3] Pers comm Campbell Stewart 22nd June 2018.